

THERMAL MANAGEMENT SOLUTIONS

NORTH AMERICAN CATALOG

CHILLERS

COOLING UNITS

HEAT EXCHANGERS

HEATERS & THERMOSTATS

FILTERFANS 4.0™

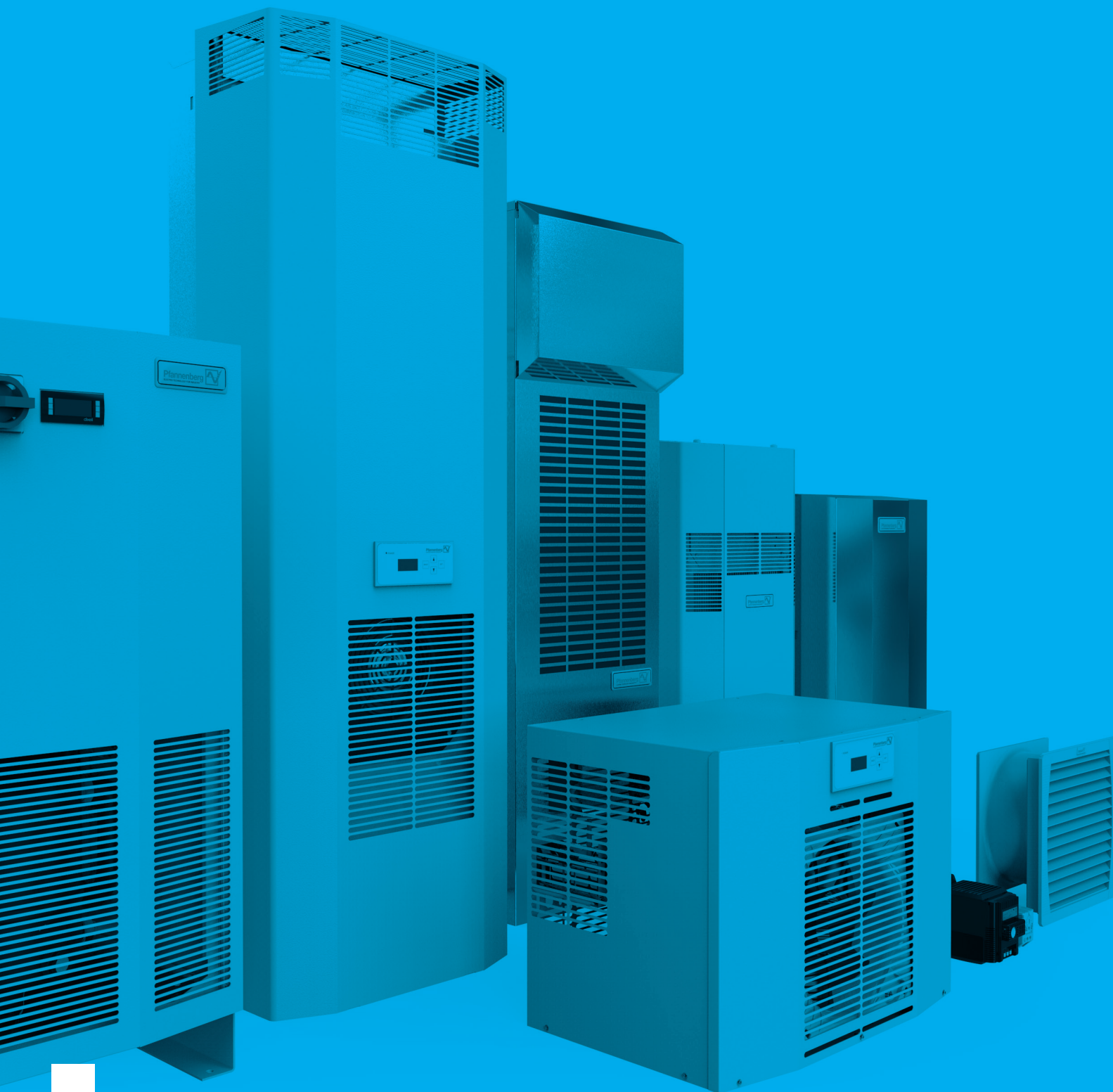


PROTECTING MAN, MACHINE AND THE ENVIRONMENT

Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY



Critical Thermal Management Solutions for Maximum Uptime & Efficiency



Why Pfannenberg?

For more than 60 years, we have been helping guarantee production safety for companies throughout the world. Our mission is to satisfy the increasing demands of modern industries by developing progressive ideas for the protection of electronics. This led to the invention of the Filterfan® and other innovations in the field of thermal management for electrical enclosures and process cooling.

A spirit of invention and German engineering genius are not our only strengths. We are also proud of the close relationships we maintain with our clients and their industries.

Pfannenberg's broad experience in delivering individual thermal management solutions positions us to provide unique, innovative benefits to our clients. Through our wide product range and a consultative team approach we develop customized high quality, cost effective, energy efficient solutions for demanding industrial requirements. This is the real value for our customers.

This catalog represents a new format for our products and services. We can provide the proper solution for any type of application. Included are our most widely requested products for North America and an overview of our comprehensive solution-orientated consultative successes, industry group applications and worldwide services.

To learn more about how we can help you, contact us today. As one of the few companies around the world to have developed and produced a complete range of industrial thermal management solutions in-house, we have a wide range of expertise to share with you.

True to our motto "Sharing Competence", we place the knowledge and technical expertise of our engineers and experts at your disposal so that you can find the best possible solutions for your requirements. Today and in the future.

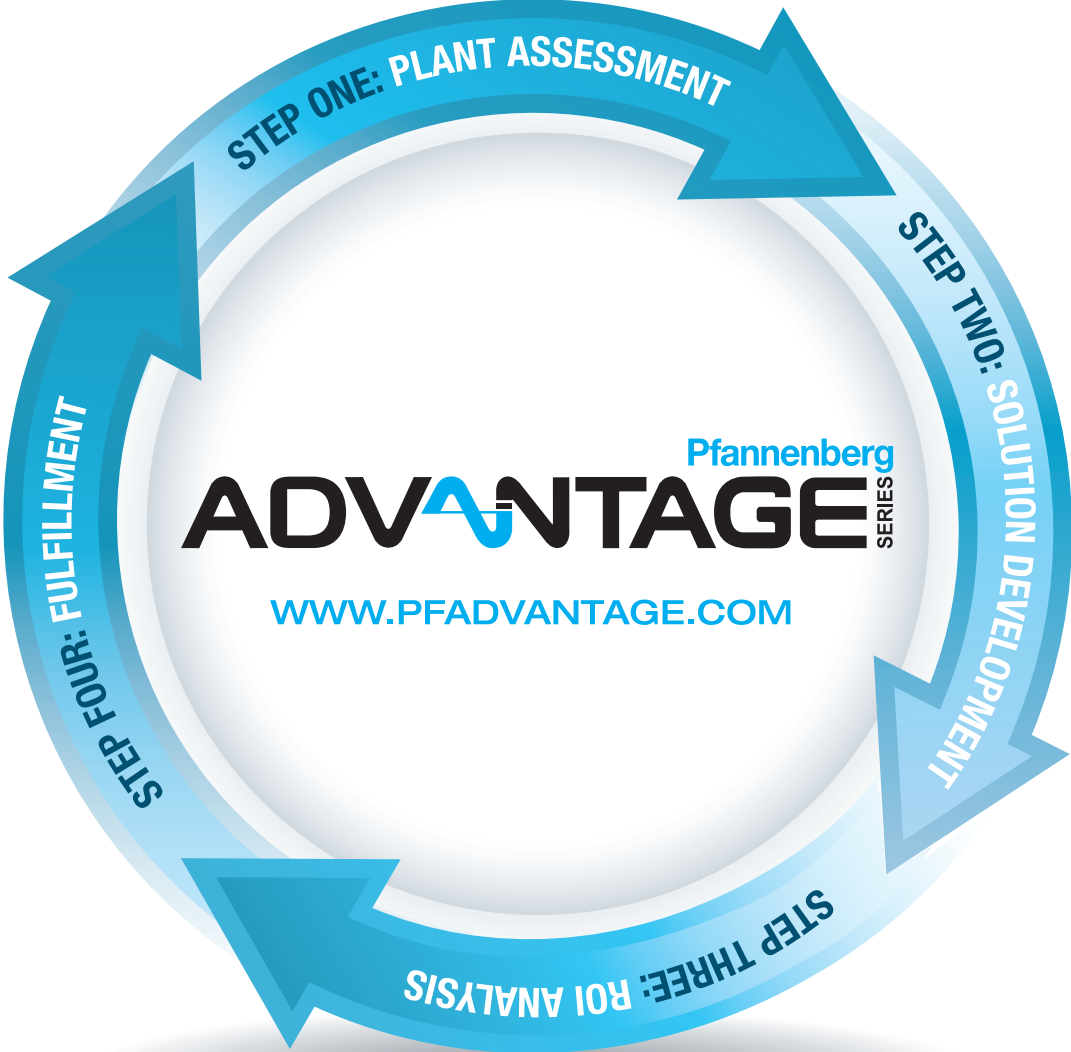
What can we do for you?

Andreas Pfannenberg, CEO



SHARING
COMPETENCE | 

WHAT IS THE PFANNENBERG ADVANTAGE™ ?



The Pfannenberg Advantage™ follows a results-driven, four-step process that begins and ends with the user.

It's a value proposition which provides solutions to problems encountered by the automation user (plant) that are associated with thermal management products. It allows Pfannenberg to take the experience gained in supplying these products to the machine builder and extend it to the point of use where it can be applied to meet specific challenges, and/or to take advantage of specific opportunities.

Step One: Plant Assessment

Pfannenberg's field engineering team visits the facility to meet with plant personnel and survey the application in order to fully understand specific thermal management challenges

Step Two: Solution Development/ Product Selection

Factory and field personnel work together to develop an application-specific solution using the best products and practices available to meet process requirements.

Step Three: ROI Analysis

Savings associated with energy usage, maintenance, "up-time", etc. are quantified and compared to total project costs to verify solution feasibility.

Step Four: Fulfillment

The complete solution is implemented through the coordinated efforts of an experienced team of factory engineers and local partners, from installation, commissioning & training to preventative maintenance & life cycle service.

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The longevity of critical electronics is ensured with proper enclosure climate control.

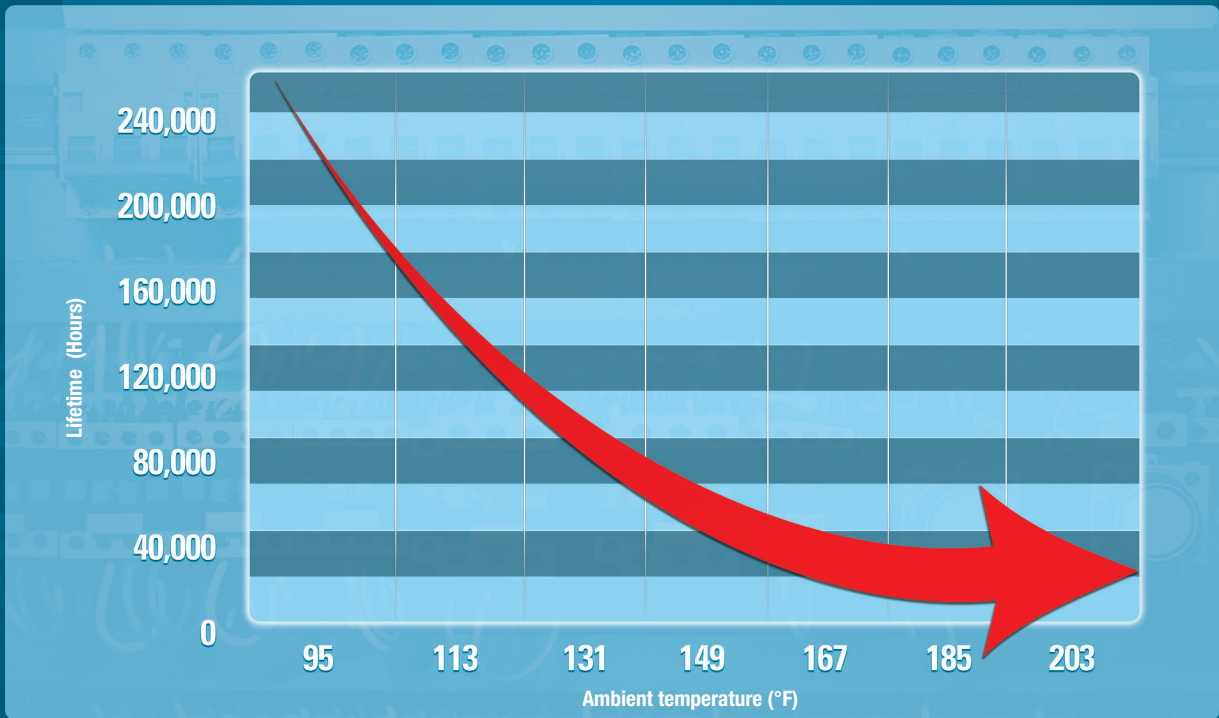
Electrical enclosures house high performance components that are critical for the control of today's production processes. These electrical components generate a significant amount of heat. Imagine the consequences when sensitive circuitry, VFDs and PLCs begin to overheat. If not properly managed this high heat leads to premature aging of electrical components and eventual shutdown of systems, leading to downtime and loss of revenue.

To ensure that sensitive electronics maintain their rated life expectancy and that they function reliably, proper regulation of the enclosure climate is necessary. Electronics are typically most efficient in an environment

where the humidity is low and the temperature is approximately 95°F. As the temperature in an enclosure rises it can have a lasting effect on the electronics. Tests have shown that an increase in temperature of as little as 18°F shortens the life expectancy of electrical components by more than 50%.

Proper thermal management is necessary. This prevents critical temperature fluctuations, avoids overheating and protects against the formation of condensate. It is essentially the backbone of your entire production process, prolonging the life of your electronics and protecting your investment.

The life expectancy of capacitors fall as the ambient temperature increases.



An increase in temperature of 18°F shortens the life time of electrical components by more than 50%.

Outside the “box” thinking is vital to protect the electronics inside.

A properly selected thermal management solution requires not only an understanding of the climate inside the enclosure but also the environment outside of the enclosure.

It is the ambient conditions around the outside of the enclosure that can have a direct effect on the best thermal management solution chosen for your application.

The environment in the electrical enclosure can be affected by weather conditions, solar radiation or other external temperature sources.

For example: An enclosure placed in an environment that is hostile to a cooling unit may require an air to

water heat exchanger. An air to water heat exchanger is not susceptible to the effects of dust and debris that would typically foul a standard air conditioner.

Electronics sensitive to electromagnetic interference, may need a shielded EMC Filterfan®.

An enclosure located outdoors or in a humid environment may require a hygostat or thermostat and a heater to eliminate the formation of condensate, leading to corrosion and short circuiting.

Contact one of our applications engineers or use our sizing software online at pfannenbergsusa.com/pss to determine the proper thermal management solution.

Both internal thermal losses and external conditions make thermal management necessary.



Determining the correct thermal management products for your application.



3 Basic Cooling Methods for Enclosure Cooling:

It is important to understand the types of cooling methods available and the how the ambient conditions may effect the product chosen. Choosing the wrong method may lead to a solution that is undersized or oversized, or fails due to being specified for incompatible ambient conditions.

1 Natural Convection

The use of louvers or grills with filters (see **PFA Exhaust Filters**) can be effective when the amount of heat being removed from your enclosure is minimal. This method usually provides less of a cooling effect than is necessary with today's components.



2 Forced Convection

If the installation will be in a clean, non-hazardous environment with an acceptable ambient (outside the enclosure) temperature range, a simple forced-air cooling system utilizing outside air is usually adequate. Combined with an air filter, such devices generally meet the heat removal needs of typical electronic equipment and many electrical applications. An example of forced convection air cooling is Filterfans®.

When can Filterfans® be used for Forced Convection Cooling?

- If the ambient temperature is always lower than the temperature required in the electrical enclosure, then Filterfans® represent an economical solution for thermal management of electrical enclosures.

Important for the use of Filterfans®:

- Use Filterfans® to force the surrounding air into the electrical enclosure, so that a slight overpressure builds up inside the enclosure.
- The surrounding air enters the electrical cabinet exclusively via the Filterfans®, which ensures that it is filtered.
- Install the Filterfans® in the lower third of the electrical enclosure and the exhaust filter as close to the top as possible. This assists the natural convection of the air and avoids hot spots within the enclosure.



3 Closed-loop Cooling

In harsh environments involving high temperatures, wash-down requirements, heavy particulate matter or the presence of chemicals capable of damaging components (NEMA 4 or 12 environments), ambient air must be kept out of the enclosure. Closed-loop cooling consists of two separate circulation systems. One system seals out the ambient air, cooling and re-circulating clean, cool air throughout the enclosure. The second system uses ambient air or water to remove and discharge the heat. Example of closed-loop cooling equipment employed with electronics and process controls are cooling units and heat exchangers.

When are cooling units necessary?

- If cooling cannot be accomplished by the outside air.
- If the temperature required inside the electrical cabinet should be equal to or lower than the ambient temperature.
- If the ambient air is strongly contaminated with oil or conductive dusts.
- When higher ingress protection is required (Type rating).

Important for the use of cooling units:

- Ensure a good supply of air intake and outtake from the external circuit of the cooling unit, so that thermal energy can be transferred to the surroundings.
- The lowest temperature inside the enclosure may not necessarily be the best. The 95 °F (35 °C) preset by Pfannenber represents a good compromise between service life and the accumulation of condensation.



When should air to air heat exchangers be used?

- If the panel temperature is allowed to be higher than the maximum ambient temperature.
- if vapors, particulates or other foreign materials in the environment that must not be allowed to penetrate the enclosure.
- Important for air/air: Air to air units have performances that are rated on the difference in temperature between the ambient and enclosure. This makes this solution ideal for equipment that can take high temperatures or systems in environments with modern ambients.



When should air to water heat exchangers be used?

- If a chilled water supply is available.
- If the ambient air cannot be used to provide cooling.
- If a very high IP class is required (up to IP 65).
- If a maintenance-free cooling solution is desired.
- If looking for an energy efficient "green" solution.

Using Chillers for efficient equipment and process cooling.

Understanding How a Chiller Works:

A chiller uses a refrigeration cycle to remove the collected heat from a circulating liquid. As the liquid moves through a system of tubes and pipes it absorbs the heat generated by equipment and processes. This generated heat is then transferred by the liquid back to the chiller where it is dissipated. Fluid is cooled and sent back into the system.

When can a chiller be used for thermal management?

- When higher heat loads that exceed traditional enclosure cooling methods need to be managed.
- When precise temperature control is required as part of the manufacturing process.
- Large fluctuations in heat load requirements need to be managed.
- When efficient cooling is desired, liquid is more efficient for cooling vs. air.
- It allows the source of cooling to be located separately from harsh environments.

Important for the use of Chillers:

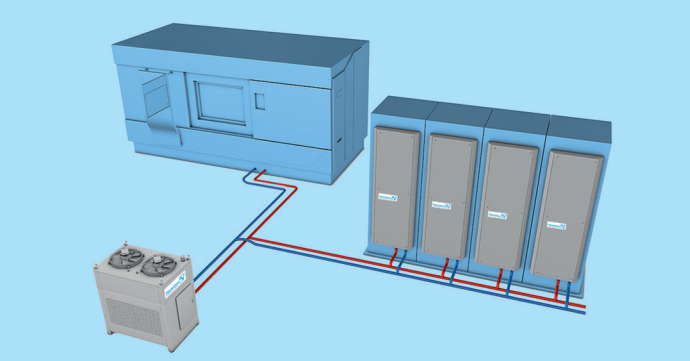
- Chillers can be installed indoors if the area around the unit is relatively clean and the air is temperate.
- Locating the chiller outside can be a good option and can improve the efficiency of the chiller depending on temperature.
- Extreme temperatures can cause capacity issues or the need for additional options such as a low ambient package.
- A chiller should be sized as close to the required capacity based on the desired chilled liquid supply temperature and the highest expected ambient temperature.



Combining products to create a complete system solution.

Chillers and PWS Air/Water Heat Exchangers

Use the combination of chillers and air/water heat exchangers to simplify the cooling of your processes, machines and controllers as part of a system based solution. Via a closed pipeline system that uses a highly economical supply of cooled liquid (e.g. water, glycol or oil) as the cooling medium, temperature can be managed within your process and as the cooling medium for the air conditioning of control cabinets. When cooling cabinets with PWS Air/Water Heat Exchangers the thermal management is 100% independent from the ambient temperatures at the installation location.






PWW Water to Water Heat Exchanger and Chiller

PWW units are ideal for use within a system when the available coolant from a chiller needs to be separated from process equipment.

An example of this would be regulating the temperature of a liquid cooled drive. Using 2 separate closed loop systems, one that cools the drive using a PWW Water to Water Heat Exchanger and one that cools the PWW using liquid from a separate chiller. Heat is exchanged between the 2 systems, tempering the coolant delivered to the drive so that the liquid is not too cold causing thermal shock or excessive condensation.

CHILLER APPLICATION EXAMPLES

 Automotive (Manufacturing)	 Food & Beverage	 Renewable Energy
Spindle Motor Cooling – High speed spindles need continuous cooling to insure accuracy and motor life. Temperature control of the tooling is required for high precision cutting applications.	Pouch Sealer Cooling – The heat used to melt the pouch material must be dissipated to allow the joined materials to cool and create the seal before moving the pouch. Efficient liquid cooling accommodates this high speed process.	Solar Inverter Cooling – Power inverters are used to convert the DC power created by solar collectors to the AC power that can be transferred to the power grid. Inverters lose up to 3% of their rated capacity in the form of heat and liquid cooling provides reliable thermal management to keep this renewable energy source on line.
Cutting Oil Cooling – Temperature control of the work piece in machining applications is needed to control dimensions. Chillers provide cooling of the recirculated and filtered cutting oil.	Mold Cooling (Injection, Thermoforming, Blow Molding) – Plastic molding involves melting (heating) the material to allow it to take the shape of the mold and then solidifying (cooling) it before the mold is opened so the shape is maintained. The use of chilled water allows rapid cooling of the molds between heating cycles in this high speed process.	Hydrogen Fuel Cell Compressor Cooling – A byproduct of raising the pressure of hydrogen gas for use in fuel cell “engines” is the heat associated with compression. Recirculated chilled water manages the temperature of the both the hydrogen gas and the mechanical compressor.
Hydraulic Oil Cooling – Hydraulic power systems are often the primary driver in manufacturing processes. The heat added to the oil by the hydraulic pump is removed by the chiller either directly, or through an intermediate heat exchanger.	Baking Process Cooling – Control for baking processes are normally subjected to the high air temperature and flour-laden environment of the oven system. Cooling control enclosures with chilled water keeps process controls operating in these “hostile” areas.	Storage Battery Cooling – Heat is created in the electrochemical process associated with the storage of electrical energy. Maintaining the temperature of the cells by removing this heat increases the overall efficiency of the storage system. Liquid cooling provides a convenient solution regardless of ambient conditions.
Polyurethane Foam Mixer – Cooling is required to remove the heat created by the mixing of the two chemicals in this process. The chiller also provides cooling for the high pressure pumps needed to convey the foam product.	Glass Inspection Camera Cooling – The inspection of glass bottles takes place in immediate proximity to this extreme high temperature process. Inspection cameras include a liquid cooled housing that protects the sensitive optics.	
Automation Control Cooling		
Automation Control Cooling – Variable frequency drives (VFDs) are used to precisely control the motion in highly automated manufacturing and packaging processes. VFDs can lose up to 3% of their rated capacity in the form of heat, so the enclosures that house them must be continuously cooled. As these enclosures are usually located close to the process machinery, cooling with recirculated liquid provided by a Pfannenberg packaged chiller offers an efficient, low maintenance solution regardless of the process environment.		

Filterfans® and Thermostats

When combining a Pfannenberg thermostat with a Filterfan®, the fan can be controlled to turn on and off based on the temperature inside the cabinet.

The benefits to this combined system are:

- Extended fan life.
- Reduced energy consumption.
- Reduced consumables and maintenance.

Improving performance, lowering costs and providing greater reliability in your manufacturing processes and bottom line.



Cooling Units, Heaters, Thermostats and Hygrostats

Adding an accessory such as a heater or thermostat to an enclosure with a cooling unit can help protect electronics from being exposed to temperatures below the recommended operating range. Another benefit to using a heater and thermostat in an enclosure is to protect from the formation of condensation within the cabinet. In a very humid environment where condensation may form at higher temperatures the hygrostat will control the heater based upon relative humidity. As a system; cooling units, heaters, thermostats and hygrostats will ensure that the environment within the enclosure is ideal for performance and service life of the critical electronics.

PSS - Pfannenberg Sizing Software

Online step-by-step product selection tool.



Need Help? Use our free software to find the recommended thermal management solution for your application?

Our Thermal Management will guide you through the sizing process, step-by-step to calculate the correct solution for your application. The sizing software is available directly on your computer visit <https://www.pfannenbergusa.com/pss>



Use your smartphone or tablet's QR Code Reader to access the web version of our sizing software. May not be compatible on all devices. You may also download an app version from the App Store or Google Play.

Also available as an app for iOS and Android. Search for Pfannenberg



Proper thermal management is key for saving resources and keeping electronics (and machinery) up and running on a consistent basis. To provide the best thermal management engineering support in the industry, Pfannenberg has developed a powerful web-based sizing application containing an easy-to-use interface. The software can be customized to your applications by allowing you to enter your own components and enclosure styles in the database for easy and fast calculations. The software also accounts for indoor/outdoor applications and assists in calculating heat dissipation within enclosure cabinets.

Selection of the preferred thermal management method, based on various environmental conditions

PRODUCTS			AMBIENT TEMPERATURE				DUST			WATER			SPECIFIC		
			Low <40 °F	Climate Controlled 65-80 °F	Medium 80-100 °F	High 100 + °F	Clean	Moderate	Heavy	Dry	Light (rain)	Washdown	Corrosive	Oily	Sea Air
FILTERFANS®	PF	p.14	○	+	○	-	+	○	-	+	○	○*	-	-	-
	Air/Air ▶ PAI 6000	p. 28	+	+	○	-	+	○	-	+	-	-	-	-	-
COOLING UNITS	Indoor ▶ DTS 3000	p. 36	-	○	+	○	+	○	-	+	-	-*	-*	-	-
	Outdoor ▶ DTS 3000	p. 36	+	○	+	+	+	○	-	○	+	-	○	○	○
	Washdown ▶ DTS 3000	p. 36	+	○	+	+	+	○	-	○	○	+	+	+	+
	£Cool ▶ DTS / DTI 9000 DTT / DTI 6000	p. 56	-	○	+	○	+	○	-	+	-	-	-	○	-
AIR / WATER HEAT EXCHANGERS	Air/Water ▶ PWS 3000	p. 76	+	○	+	+	+	+	+	+	+	+	+	+	+
CHILLERS	CC	p.104	-	+	+	-	+	○	-	+	○	-	-	-	-
	EB	p.106	○	+	+	○	+	○	-	+	○	-	-	-	-
	PWW	p.110	**	+	+	+	+	+	+	+	○	-	-	○	-
HEATERS	FLH / PFH	p.114	+	+	○	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

- +

Best Option
- Consult Factory for Best Solution
- **

Requires Special Options
- Good
- *

W/Rainhood
- N/A

Not Applicable





PF/PFA Series Filterfans 4.0™ and Exhaust Filters

Trust in the Original

Otto Pfannenber's invention of the Filterfan® in 1958 was a milestone in the area of industrial thermal management. As a result of over 50 years of experience and continuous development, Pfannenber's Filterfans® have evolved into the trusted name for forced convective cooling to circulate and cool the air in your cabinets.

With our flow optimized fins and rotor blades, the Filterfan 4.0™ reaches a particularly high airflow and at the same time provide an IP 55, Type 12 system of protection. The flat-profile, uni-colored design complements modern machines and plants.

Pfannenber's patented click mechanism on our Filterfans 4.0™ have a unique patented 4-corner fastening system enabling safe and quick, tool-free installation allowing the filter medium to be replaced in seconds.

The fluted filter mat's folded structure provides an unrivaled airflow guaranteeing Nema Type 12 protection, while also extending the filters lifetime 300% longer than conventional filter.

All in all, our Filterfans 4.0™ contain 11 field-proven patented features.



THE TECHNOLOGY OF COOLING

Cooling with Filterfans®

If the installation will be in a clean, non-hazardous environment with an acceptable ambient (outside the enclosure) temperature range, a simple forced-air cooling system utilizing outside air is usually adequate. Combined with an air filter, such devices generally meet the heat removal needs of typical electronic equipment and many electrical applications.

How do I know if a Filterfan® is the right product for my application?

- If the temperature rise inside the enclosure can be higher than the ambient.
- If multiple configurations are needed. Filterfans® can be located in a number of locations within complex enclosure configurations.

Calculating the required airflow

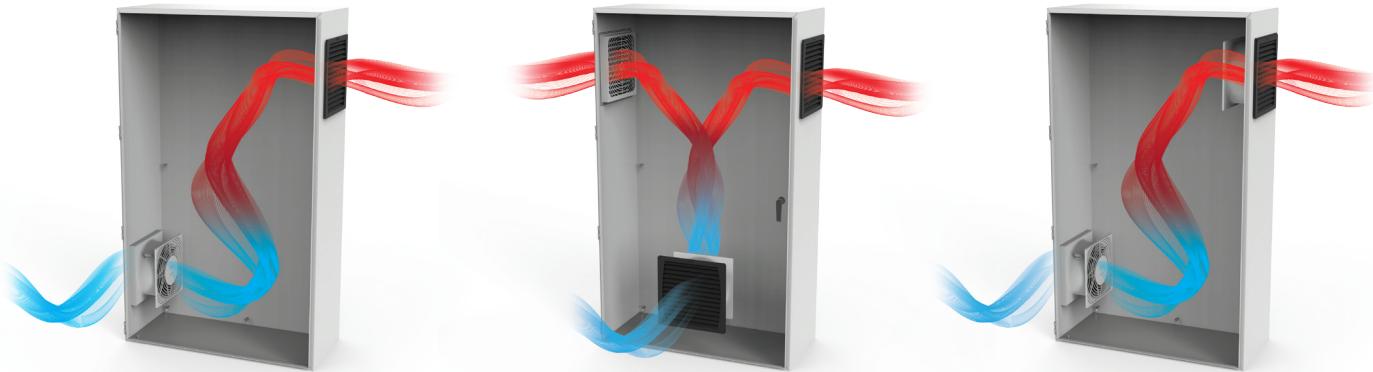
To properly size a Filterfan® it's important to understand how static pressure effects the performance of a fan. See [Understanding CFM](#) on the opposite page.

$$V = \frac{1.82 (P_D)}{\Delta T} [cfm]$$

- **V[cfm]:**
Airflow volume of Filterfans®
- **P_D [Watt]:**
Dissipation loss: Thermal power generated inside a cabinet by the dissipation loss of components
- **ΔT[°C]:**
Difference in temperature between the ambient and inside the electronic cabinet

Utilizing Filterfans®

- Always use the Filterfans® to propel the cool ambient air into enclosure.
- Slight positive pressure builds up inside the cabinet so that only air filtered by the Filterfans® flows into the enclosure.
- The air propelled into the cabinet displaces the warm air which exits through the exhaust filter.
- When installing a combination of Filterfans® and exhaust filters, fit the Filterfans® in the lower third of the cabinet and the exhaust filter(s) near the top of the cabinet.



Model No.	CFM (Filterfan® + exhaust filter)
PF11000	11
PF22000	28
PF32000	38
PF42500	74
PF43000	122
PF65000	224
PF66000	295
PF 67000	368

Model No.	CFM (Filterfan® + 2 exhaust filters)
PF11000	12
PF22000	31
PF32000	47
PF42500	79
PF43000	138
PF65000	256
PF66000	335
PF 67000	452

Model No.	CFM (Filterfan® intake + Filterfan® exhaust)
PF11000	31
PF22000	68
PF32000	95
PF42500	109
PF43000	202
PF65000	440
PF66000	832
PF 67000	1008

FILTERFANS 4.0™ QUICK SELECTION CHART

Type	Air flow rate¹	Rated voltage	Cut-out dimensions (HxW)³ inches (mm)	Approvals					Page
	CFM² (Type 12 / IP 55)			UL	cUL	GOST	CSA	CE	
PF Series Filterfans 4.0™									
PF 11000	17	115 V / 230 V AC	3.62 x 3.62 (92 x 92)	●	●	●	●	●	19
		24 V DC							
PF 22000	38	115 V / 230 V AC	4.92 x 4.92 (125 x 125)	●	●	●	●	●	19
		24 V DC							
PF 32000	65	115 V / 230 V AC	6.97 x 6.97 (177 x 177)	●	●	●	●	●	20
		24 V DC							
PF 42500	94	115 V / 230 V AC	8.78 x 8.78 (223 x 223)	●	●	●	●	●	21
		24 V DC							
PF 43000	169	115 V / 230 V AC	8.78 x 8.78 (223 x 223)	●	●	●	●	●	21
		24 V DC							
PF 65000	297	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●	●	●	●	22
PF 66000	462	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●	●	●	●	23
		400 V / 460 V 3 Ø							
PF 67000	560	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●	●	●	●	23
		400 V / 460 V 3 Ø							
PF Slim Line Filterfans 4.0™									
PF 33000 SL	152	115 V / 230 V AC	6.97 x 6.97 (177 x 177)	●	●			●	20
PF 65000 SL	325	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●		●	●	22
PF 67000 SL	427	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●		●	●	23
		400 V / 460 V 3 Ø							
PTF Series Top-Mounted Filterfans 4.0™									
PTF 60500	206	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●	●		●	24
PTF 60700	324	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●	●		●	24
		400 V / 460 V 3 Ø							
PTF 61000	441	115 V / 230 V AC	11.46 x 11.46 (291 x 291)	●	●	●		●	24
PTFA Series Top Exhaust Filters									
PTFA 60000	N/A	N/A	11.46 x 11.46 (291 x 291)	●	●	●		●	24
PFA Series exhaust filters									
PFA 10000	N/A	N/A	3.62 x 3.62 (92 x 92)	●	●	●	●	●	25
PFA 20000			4.92 x 4.92 (125 x 125)	●	●	●	●	●	25
PFA 30000			6.97 x 6.97 (177 x 177)	●	●	●	●	●	25
PFA 40000			8.78 x 8.78 (223 x 223)	●	●	●	●	●	25
PFA 60000			11.46 x 11.46 (291 x 291)	●	●	●	●	●	25

¹ free-blowing

• available ○ pending

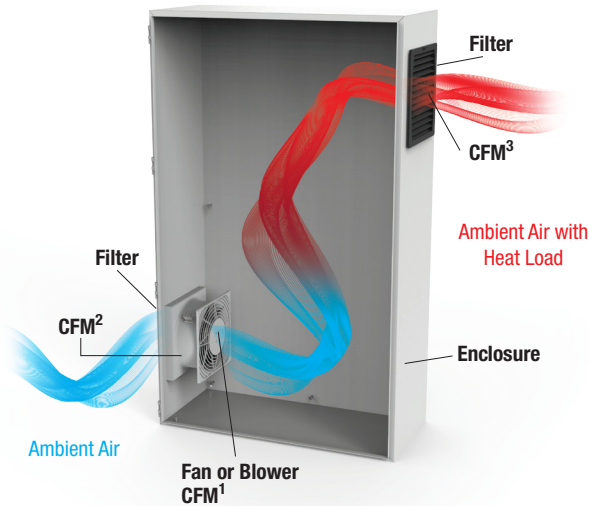
Understanding CFM

Model No.	CFM¹	CFM²	CFM³
PF11000	36	17	11
PF22000	105	38	28
PF32000	105	65	38
PF42500	121	94	74
PF43000	224	155	122
PF65000	489	297	224
PF66000	1024	462	295
PF 67000	1250	560	368

¹ Fan only (unfiltered)

² Filterfan® assembly (uninstalled)

³ Single Filterfan® installed on an enclosure with one filtered exhaust assembly
(Note: Always calculate cooling capacity of Filterfans® with the CFM³ value.)



FILTERFANS 4.0™

Filterfans® / Exhaust Filters

Trust in the Original. Otto Pfannenberg's invention of the Filterfan® in 1958 was a milestone in the area of industrial thermal management. Today Pfannenberg provides a wide range of different solutions for industrial thermal management and is thus one of the few specialists that can provide the appropriate devices for virtually all industrial requirements – worldwide.

NEMA Type 12 Protection

The closed frame design prevents unfiltered air from penetrating the cabinet.

Highest Quality Fans

German manufactured fans that exceed industry standards for quality, performance and service life.

Highest System Airflow Compared to Competitors Filter Fans.

The design of the louvers supports the greatest airflow while further protecting against airborne dust and dirt.

Patented Tool-Less 4 Corner Fastening System

The patented fastening system allows for fast installation (possible to install in seconds) and easy removal reducing MITR.

Aesthetically Pleasing Design Using Neutral Colors

Available in a standard RAL 7035 Grey and an optional Black color. These units blend in well with the modern styles and colors used for existing machines and systems.

300% Longer Service Time via Patented Fluted Filter Mat

A larger surface area on the filter mat allows for a high filtration level, greater service life and maximum airflow. Saving time and money.

Globally Compatible

ERP compliant to meet European efficiency directives. Units also comply with additional national and international standards, e.g. TÜV, NEMA, UL, CSA and EAC.

Versatile Options

Options including UV Protected Plastic for use in direct sunlight, EMC shielding to attenuate RF signals and exhausting fans for custom applications.

PF SERIES

FILTERFANS 4.0™



PF 11000

- Airflow rate up to 17 CFM
- System of protection IP 54, NEMA type 12
- Cut-out dimensions: 92 x 92 mm



PF 11000 FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 24 VDC	System of protection (UL 50)	NEMA Type 12 - standard filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 3
Service life L ₁₀ (+ 40 °C)	52,500 h / 55,000 h / 70,000 h (DC)	Unimpeded airflow	17 CFM
Weight	1.2 lb / .35 (DC)	Airflow rate in combination (PF + PFA 20.000)	11 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	88%
Noise level (EN ISO 3741)	33 dB (A)	Part no. * 115 V, Lt. Grey	11611151055
Type of connection	cable, 2-core, length 310 mm	Part no. * 115 V, Black	11611151050
Bearing type	sleeve bearing / ball bearing (DC)	Part no. * 230 V, Lt. Grey	11611101055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11611101050
Power consumption	11 W / 2.4 W (DC)	Part no. * 24 VDC, Lt. Grey	11611801055
Width x height x depth	4.29 x 4.29 x 2.44 in	Part no. * 24 VDC, Black	11611801050
System of protection (EN 60529)	IP 54	Part no. Spare part filter mats (5 pieces)	18611600029
		Part no. NEMA Type 3R Rainhood *	See page 27 for part no.

PF 22000

- Airflow rate up to 38 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 125 x 125 mm



PF 22000 FILTERFANS®			
Available voltages± 10%	115 V, 230 V, 24 VDC	System of protection (UL 50)	NEMA Type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h / 37,500 h / 62,500 h (DC)	Unimpeded airflow18	38 CFM
Weight	1.5 lb / .97 (DC)	Airflow rate in combination (PF + PFA 20.000)	28 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	44 dB (A)	Part no. * 115 V, Lt. Grey	11622154055
Type of connection	terminal strip / cable, 2 core, length 310 mm	Part no. * 115 V, Black	11622154050
Bearing type	sleeve bearing / ball bearing (DC)	Part no. * 230 V, Lt. Grey	11622104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11622104050
Power consumption	20 W /18 W / 5 W (DC)	Part no. * 24 VDC, Lt. Grey	11622804055
Width x height x depth	5.71 x 5.71 x 2.76 in	Part no. * 24 VDC, Black	11622804050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600034
		Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

*Consult factory for additional options



Energy Savings Solution

DID YOU KNOW?

Installing a thermostat with a Filterfan® can save energy and extend the service life of the Filterfan®.

Pfannenberg's FLZ 530 Thermostats are designed to work directly with our Filterfans®. This provides efficient operation of the Filterfan® based on the temperature setting leading to greater reliability within the production process.

For additional thermostat models please visit the Heaters & Thermostat section found within this catalog.

FLZ Series Thermostats		
Model number	Range	Part Number RAL 7035 (Light Grey)
FLZ 530	0-60 °C	17121000000
	32-140 °F	17121000010



PF SERIES

FILTERFANS 4.0™

PF 32000

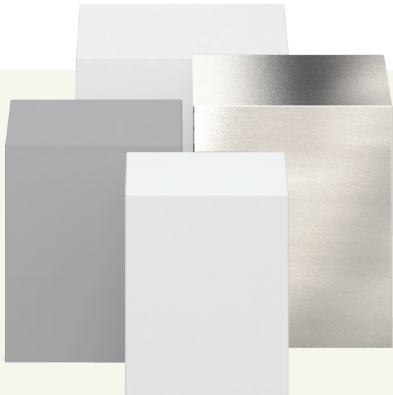
- Airflow rate up to 65 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 177 x 177 mm



PF 32000 FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 24 VDC	System of protection (UL 50)	NEMA Type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h / 37,500 h / 62,500 h (DC)	Unimpeded airflow	65 CFM
Weight	1.9 lb / 1.3 lb (DC)	Airflow rate in combination (PF + PFA 30.000)	38 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	40 dB (A)	Part no. * 115 V, Lt. Grey	11632154055
Type of connection	terminal strip / cable, 2 core, length 310 mm	Part no. * 115 V, Black	11632154050
Bearing type	sleeve bearing / ball bearing (DC)	Part no. * 230 V, Lt. Grey	11632104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11632104050
Power consumption	20 W / 18 W / 5 W (DC)	Part no. * 24 VDC, Lt. Grey	11632804055
Width x height x depth	7.95 x 7.95 x 3.66 in	Part no. * 24 VDC, Black	11632804050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600035
		Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

PF 33000 SL SLIM LINE FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 24 VDC	System of protection (UL 50)	NEMA Type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h / 80,000 h (DC)	Unimpeded airflow	152 CFM
Weight	3.68 lb	Airflow rate in combination (PF + PFA 30.000)	115 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	42 dB (A)	Part no. * 115 V, Lt. Grey	11633156055
Type of connection	cables (DC) / Terminal (AC)	Part no. * 115 V, Black	11633156050
Bearing type	ball bearing (DC)	Part no. * 230 V, Lt. Grey	11633106055
Approvals	UL, CE, CSA	Part no. * 230 V, Black	11633106050
Power consumption	40 W / 39 W / 12 W (DC)	Part no. * 24 VDC, Lt. Grey	11633806055
Width x height x depth	7.95 x 7.95 x 3.70 in	Part no. * 24 VDC, Black	11633806050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600035
		Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

*Consult factory for additional options



DID YOU KNOW?

That if you need to install a Filterfan® in an environment that requires additional protection from the weather or a directed water spray, Pfannenberg offers protective hoods. These NEMA 3R/4 Rain Hoods offer protection from falling water, snow/ice and washdown spray with minimal airflow reduction. The hoods are available in light grey or dark grey to match your enclosures and a 4X stainless steel option. **Note: This technique will not prevent hazardous gases or humidity from entering the cabinet.**

Turn to page 27 for an overview of our new and improved rainhoods.

PF SERIES

FILTERFANS 4.0™

PF 42500

- Airflow rate up to 94 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 223 x 223 mm



PF 42500 FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 24 VDC	System of protection (UL 50)	NEMA Type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	42,500 h / 40,000 h / 70,000 h (DC)	Unimpeded airflow	94 CFM
Weight	3 lb / 2 lb (DC)	Airflow rate in combination (PF + PFA 40.000)	74 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	43 dB (A)	Part no. * 115 V, Lt. Grey	11642154055
Type of connection	spring-type terminal	Part no. * 115 V, Black	11642154050
Bearing type	ball bearing	Part no. * 230 V, Lt. Grey	11642104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11642104050
Power consumption	17 W / 4.7 W (DC)	Part no. * 24 VDC, Lt. Grey	11642804055
Width x height x depth	9.92 x 9.92 x 4.05 in	Part no. * 24 VDC, Black	11642804050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600036
		Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

PF 43000 FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 24 VDC	System of protection (UL 50)	NEMA Type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h / 80,000 h (DC)	Unimpeded airflow	155 CFM
Weight	3.68 lb / 3.33 lb (DC)	Airflow rate in combination (PF + PFA 40.000)	122 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	46 dB (A) / 42 dB (A) (DC)	Part no. * 115 V, Lt. Grey	11643154055
Type of connection	spring-type terminal	Part no. * 115 V, Black	11643154050
Bearing type	ball bearing	Part no. * 230 V, Lt. Grey	11643104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11643104050
Power consumption	40 W / 39 W / 12 W (DC)	Part no. * 24 VDC, Lt. Grey	11643804055
Width x height x depth	9.92 x 9.92 x 4.69 in	Part no. * 24 VDC, Black	11643804050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600036
		Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

*Consult factory for additional options

DID YOU KNOW?

Untreated plastics exposed to continuous sunlight will experience UV degradation; becoming damaged, cracked and brittle. Pfannenberg's specially treated IP55 UV-Resistant Plastic Filterfans® and UV-Resistant Plastic Exhaust Filters are the best option for use in outdoor applications exposed to the sun.

Protect your investment, reduce maintenance costs and extend the life of the product.

Available in PF 22000 - PF 67000 series models. Just add "UV" to the model number when ordering.



PF SERIES

FILTERFANS 4.0™

PF 65000

- Airflow rate up to 297 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PF 65000 FILTERFANS®			
Available voltages ± 10%	115 V, 230 V	System of protection (EN 60529)	IP 55
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	System of protection (UL 50)	NEMA Type 12 - fluted filter
Service life L ₁₀ (+ 40 °C)	40,000 h	Filter mat quality class	G 4
Weight	7 lb	Unimpeded airflow	297 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Airflow rate in combination (PF + PFA 60.000)	224 CFM
Noise level (EN ISO 3741)	52 dB (A)	Filtration efficiency	91%
Type of connection	spring-type terminal	Part no. * 115 V, Lt. Grey	11665154055
Bearing type	ball bearing	Part no. * 115 V, Black	11665154050
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Lt. Grey	11665104055
Power consumption	90 W / 80 W	Part no. * 230 V, Black	11665104050
Width x height x depth	12.6 x 12.6 x 6.18 in	Part no. Spare part filter mats (5 pieces)	18611600037
System of protection (EN 60529)	IP 55	Part no. NEMA Type 3R Rainhood *	See page 27 for part no.

PF 65000 SL

- Airflow rate up to 325 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PF 65000 SL SLIM LINE FILTERFANS®			
Available voltages ± 10%	115 V, 230 V	System of protection (UL 50)	NEMA type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h	Unimpeded airflow	325 CFM
Weight	7 lb	Airflow rate in combination (PF + PFA 60.000)	249 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	52 dB (A)	Part no. * 115 V, Lt. Grey	11675154055
Type of connection	spring-type terminal	Part no. * 115 V, Black	11675154050
Bearing type	ball bearing	Part no. * 230 V, Lt. Grey	11675104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11675104050
Power consumption	80 W	Part no. Spare part filter mats (5 pieces)	18611600037
Width x height x depth	12.6 x 12.6 x 5.16 in	Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.
System of protection (EN 60529)	IP 55		

*Consult factory for additional options

DID YOU KNOW?

Installing a standard intake Filterfan® lower than the exhaust filter is the most efficient method for removing heat from an enclosure. There are times when the placement of internal electronics prevents this type of installation. You can flip the fan in the field or you can order reverse flow Filterfans® that exhausts air from the upper portion of the enclosure. This process creates a partial vacuum allowing air to be drawn in through a PFA Exhaust Filter maintaining the same system airflow. Reverse Filterfans® can also be used in series with intake Filterfans® to increase airflow through the system.

Reverse flow Filterfans® are available for all models. Just add "A" to the model number when ordering. Consult factory for 11 digit part number.

PF SERIES

FILTERFANS 4.0™

PF 66000

- Airflow rate up to 462 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PF 66000 FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 400 / 460 V	System of protection (UL 50)	NEMA type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h	Unimpeded airflow	462 CFM
Weight	7 lb	Airflow rate in combination (PF + PFA 60.000)	295 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	64 dB (A)	Part no. * 115 V, Lt. Grey	11666154055
Type of connection	spring-type terminal	Part no. * 115 V, Black	11666154050
Bearing type	ball bearing	Part no. * 230 V, Lt. Grey	11666104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11666104050
Power consumption	160 W / 150 W / 155 W	Part no. * 400/460 V, Lt. Grey	11666024055
Width x height x depth	12.6 x 12.6 x 6.18 in	Part no. * 400/460 V, Black	11666024050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600037
		Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

PF 67000

- Airflow rate up to 560 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PF 67000 FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 400 / 460 V	System of protection (UL 50)	NEMA type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h	Unimpeded airflow	560 CFM
Weight	8.16 lb	Airflow rate in combination (PF + PFA 60.000)	368 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	66 / 69 dB (A)	Part no. * 115 V, Lt. Grey	11667154055
Type of connection	spring-type terminal	Part no. * 115 V, Black	11667154050
Bearing type	ball bearing	Part no. * 230 V, Lt. Grey	11667104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11667104050
Power consumption	195 W / 200 W / 170 W	Part no. * 400/460 V, Lt. Grey	11667024055
Width x height x depth	12.6 x 12.6 x 6.18 in	Part no. * 400/460 V, Black	11667024050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600037
		Part no. NEMA Type 3R Rainhood *	See page 27 for part no.

PF 67000 SL

- Airflow rate up to 427 CFM
- System of protection IP 55, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PF 67000 SL SLIM LINE FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 400 / 460 V	System of protection (UL 50)	NEMA type 12 - fluted filter
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO	Filter mat quality class	G 4
Service life L ₁₀ (+ 40 °C)	40,000 h	Unimpeded airflow	427 CFM
Weight	8.82 lb / 8.93 lb / 8.49 lb	Airflow rate in combination (PF + PFA 60.000)	342 CFM
Color	RAL 7035 (Lt. Grey) RAL 9011 (Black)	Filtration efficiency	91%
Noise level (EN ISO 3741)	69 dB (A)	Part no. * 115 V, Lt. Grey	11677154055
Type of connection	spring-type terminal	Part no. * 115 V, Black	11677154050
Bearing type	ball bearing	Part no. * 230 V, Lt. Grey	11677104055
Approvals	UL, cUL, CE, (on request: GOST)	Part no. * 230 V, Black	11677104050
Power consumption	165 W / 180 W / 165 W	Part no. * 400/460 V, Lt. Grey	16677124055
Width x height x depth	12.6 x 12.6 x 5.27 in	Part no. * 400/460 V, Black	16677124050
System of protection (EN 60529)	IP 55	Part no. Spare part filter mats (5 pieces)	18611600037
		Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

*Consult factory for additional options

DID YOU KNOW?

Pfannenberg's Filterfans 4.0™ were developed and optimized after more than 1,000 tests in our modern test laboratory. Our engineers use specially designed climate chambers to test and measure the capabilities of our thermal management products.



PTF SERIES
ROOF MOUNT FILTERFANS®

PTF 60500

- Airflow rate up to 206 CFM
- Tool-less mounting, patented quick fastening system
- System of protection IP 54, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PTF 60500 ROOF MOUNT FILTERFANS®			
Available voltages ± 10%	115 V, 230 V	Width x Depth x Height	16.93 x 16.93 x 4.92
Design (housing and protection against accidental contact)	sheet steel, cover powder-coated; snap-in housing made of injection-molded thermoplastic (ABS-FR) self-extinguishing, UL 94 VO	System of protection (EN 60529 / UL 50)	IP 54
		Filter mat quality class	G 3
Service life L ₁₀ (+ 40 °C)	approx. 50,000 h	Unimpeded airflow	206 CFM
Weight	5.5 lb	Airflow rate in combination (PF + PFA 60.000)	142 CFM
Color	RAL 7035 (Lt. Grey)	Filtration efficiency	81% 0%
Noise level (EN ISO 3741)	67 dB (A)		
Type of connection	terminal strip	Part no. * (115 V)	11685151055
Bearing type	ball bearing	Part no. Spare part filter mats (20 pieces)	18611600038
Approvals	UL, cUL, CE, (on request: GOST)		
Power consumption	4 x 24 W / 4 x 29 W		

PTF 60700

- Airflow rate up to 324 CFM
- Tool-less mounting, patented quick fastening system
- System of protection IP 54, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PTF 60700 ROOF MOUNT FILTERFANS®			
Available voltages ± 10%	115 V, 230 V, 400 / 460 V	Width x Depth x Height	18.5 x 18.5 x 5.51 in
Design (housing and protection against accidental contact)	sheet steel, cover powder-coated; snap-in housing made of injection-molded thermoplastic (ABS-FR) self-extinguishing, UL 94 VO	System of protection (EN 60529 / UL 50)	IP 54
		Filter mat quality class	G 3
Service life L ₁₀ (+ 40 °C)	approx. 40,000 h	Unimpeded airflow	324 CFM
Weight	5.8 lb	Airflow rate in combination (PF + PFA 60.000)	218 CFM
Color	RAL 7035 (Lt. Grey)	Filtration efficiency	81%
Noise level (EN ISO 3741)	69 dB (A)		
Type of connection	terminal strip	Part no. * (115 V)	11687152055
Bearing type	ball bearing	Part no. Spare part filter mats (20 pieces)	18611600039
Approvals	UL, cUL, CE, (on request: GOST)		
Power consumption	90 W / 80 W		

PTF 61000

- Airflow rate up to 441 CFM
- Tool-less mounting, patented quick fastening system
- System of protection IP 54, NEMA type 12
- Cut-out dimensions: 291 x 291 mm



PTF 61000 ROOF MOUNT FILTERFANS®			
Available voltages ± 10%	115 V, 230 V	Width x Depth x Height	18.5 x 18.5 x 5.51 in
Design (housing and protection against accidental contact)	sheet steel, cover powder-coated; snap-in housing made of injection-molded thermoplastic (ABS-FR) self-extinguishing, UL 94 VO	System of protection (EN 60529 / UL 50)	IP 54
		Filter mat quality class	G 3
Service life L ₁₀ (+ 40 °C)	approx. 40,000 h	Unimpeded airflow	441 CFM
Weight	6 lb	Airflow rate in combination (PF + PFA 60.000)	294 CFM
Color	RAL 7035 (Lt. Grey)	Filtration efficiency	81%
Noise level (EN ISO 3741)	77 dB (A)		
Type of connection	terminal strip	Part no. * (115 V)	11681152055
Bearing type	ball bearing	Part no. Spare part filter mats (20 pieces)	18611600039
Approvals	UL, cUL, CE, (on request: GOST)		
Power consumption	160 W / 150 W		

PTFA 60000

- Tool-less mounting, patented quick fastening system
- System of protection IP 54, NEMA type 12
- W x D x H: 16.93 x 16.93 x 4.92 in
- Cut-out dimensions: 291 x 291 mm



PTFA 60000 TOP MOUNT EXHAUST FILTERS	
Design (housing and protection against accidental contact)	sheet steel, cover powder-coated; snap-in housing made of injection-molded thermoplastic (ABS-FR) self-extinguishing, UL 94 VO
Color	RAL 7035 (Lt. Grey)
Approvals	UL, cUL, CE, (on request: GOST)
System of protection (EN 60529 / UL 50)	IP 54
Filter mat quality class	G 3
Part no. *	11186002054
Part no. Spare filter mats (20 pieces)	18611600038

*Consult factory for additional options

PFA SERIES
EXHAUST FILTERS

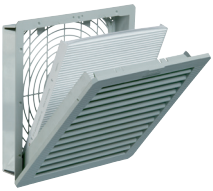
PFA 10000

- Snap fastener without screws
- Simple filter mat exchange
- With integrated foam seal to enclosure
- W x H x D: 4.29 x 4.29 x .90 in
- Cut-out dimensions: 92 x 92 mm
- Color: RAL 7035 (Lt. Grey) RAL 9011 (Black)



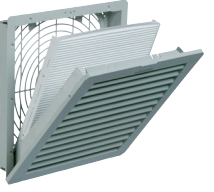
PFA 20000

- Snap fastener without screws
- Simple filter mat exchange
- With integrated foam seal to enclosure
- W x H x D: 5.71 x 5.71 x 1.22 in
- Cut-out dimensions: 125 x 125 mm
- Color: RAL 7035 (Lt. Grey) RAL 9011 (Black)



PFA 30000

- Snap fastener without screws
- Simple filter mat exchange
- With integrated foam seal to enclosure
- W x H x D: 7.95 x 7.95 x 1.57 in
- Cut-out dimensions: 177 x 177 mm
- Color: RAL 7035 (Lt. Grey) RAL 9011 (Black)



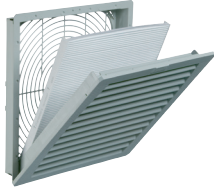
PFA 40000

- Snap fastener without screws
- Simple filter mat exchange
- With integrated foam seal to enclosure
- W x H x D: 9.92 x 9.92 x 1.74 in
- Cut-out dimensions: 223 x 223 mm
- Color: RAL 7035 (Lt. Grey) RAL 9011 (Black)



PFA 60000

- Snap fastener without screws
- Simple filter mat exchange
- With integrated foam seal to enclosure
- W x H x D: 12.6 x 12.6 x 1.8 in
- Cut-out dimensions: 291 x 291 mm
- Color: RAL 7035 (Lt. Grey) RAL 9011 (Black)



PFA 10000 EXHAUST FILTERS	
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO
Approvals	UL, cUL, CE, (on request: GOST)
Version	IP 54
System of protection (EN 60529 / UL 50)	NEMA type 12 - standard filter
Filter mat quality class	G 3
Part no. *	11710001055 (Lt. Grey)
Part no. *	11710001050 (Black)
Part no. Spare filter mats (5 pieces)	18611600029
Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

PFA 20000 EXHAUST FILTERS	
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO
Approvals	UL, cUL, CE, (on request: GOST)
System of protection (EN 60529 / UL 50)	NEMA type 12 - fluted filter
Filter mat quality class	G 4
Part no. *	11720004055 (Lt. Grey)
Part no. *	11720004050 (Black)
Part no. Spare filter mats (5 pieces)	18611600034
Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

PFA 30000 EXHAUST FILTERS	
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO
Approvals	UL, cUL, CE, (on request: GOST)
System of protection (EN 60529 / UL 50)	NEMA type 12 - fluted filter
Filter mat quality class	G 4
Part no. *	11730004055 (Lt. Grey)
Part no. *	11730004050 (Black)
Part no. Spare filter mats (5 pieces)	18611600035
Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

PFA 40000 EXHAUST FILTERS	
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO
Approvals	UL, cUL, CE, (on request: GOST)
System of protection (EN 60529 / UL 50)	NEMA type 12 - fluted filter
Filter mat quality class	G 4
Part no. *	11740004055 (Lt. Grey)
Part no. *	11740004050 (Black)
Part no. Spare filter mats (5 pieces)	18611600036
Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

PFA 60000 EXHAUST FILTERS	
Design (housing and protection against accidental contact)	made of injection-molded thermoplastic, self-extinguishing, UL 94 VO
Approvals	UL, cUL, CE, (on request: GOST)
System of protection (EN 60529 / UL 50)	NEMA type 12 - fluted filter
Filter mat quality class	G 4
Part no. *	11760004055 (Lt. Grey)
Part no. *	11760004050 (Black)
Part no. Spare filter mats (5 pieces)	18611600037
Part no. NEMA Type 3R/4/4X Rainhoods *	See page 27 for part no.

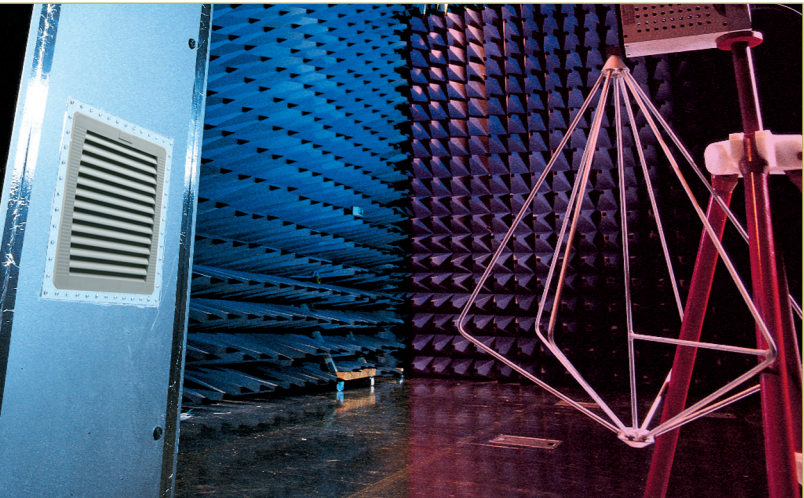
*Consult factory for additional options



PF/PFA EMC SERIES

EMC FILTERFANS 4.0™ / EXHAUST FILTERS

Protect your sensitive electronics from electromagnetic interference when cooling with Filterfans®. The use of a Filterfan® for thermal management requires an opening to be cut into the cabinet. These openings can allow electromagnetic radiation to pass in or out unhindered. **Pfannenbergs EMC Filterfans® offer the widest range of protection against electromagnetic interference.** We offer several combinations of EMC Filterfans® and exhaust filters for air flow rates from 17 to 560 CFM2. To better protect the environment, our EMC Filterfans® and exhaust filters do not use metalized plastics, because these are difficult to recycle.

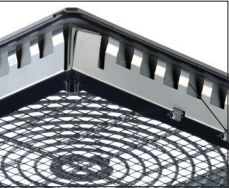


EMC – Electromagnetic Compatibility

In standards, electromagnetic compatibility, or ‘EMC’ for short, is defined as the ability of a component, device or system to function satisfactorily under the influence of electromagnetic fields in its surroundings, without influencing its surroundings, to which other electrical equipment also belongs, in an impermissible way. We guarantee that our EMC shielded Filterfans® provide protection against electromagnetic interference by ensuring continuity between the shielding part of the fan and the metal structure of the cabinet based on the attenuation characteristics below:

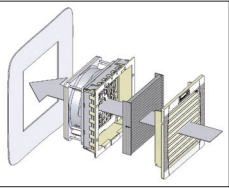
Attenuation at 30 MHz approx. 71 dB
Attenuation at 400 MHz approx. 57 dB
Measured in accordance with EN 50 147-1 (1996): absorber rooms, part 1, measurement of screening attenuation.

Type	Part Number	Replacement Filter Mat	Air flow rate¹	Rated voltage	Cut-out dimensions (HxW)³ inches (mm)	Approvals			
			CFM2 (Type 12 / IP 55)			UL	cUL	GOST	CE
PF Series EMC Filterfans 4.0™									
PF 11000 EMC	11811151055 115 V, LT. Grey	18611600029	Same as PF series	Same as PF series	3.66 x 3.66 (93 x 93)	●	●	●	●
PF 22000 EMC	11822153055 115 V, LT. Grey	18611600034			4.96 x 4.96 (126 x 126)	●	●	●	●
PF 32000 EMC	11832153055 115 V, LT. Grey	18611600035			7.01 x 7.01 (178 x 178)	●	●	●	●
PF 42500 EMC	11842153055 115 V, LT. Grey	18611600036			8.82 x 8.82 (224 x 224)	●	●	●	●
PF 43000 EMC	11843153055 115 V, LT. Grey	18611600036			8.82 x 8.82 (224 x 224)	●	●	●	●
PF 65000 EMC	11865153055 115 V, LT. Grey	18611600037			11.50 x 11.50 (292 x 292)	●	●	●	●
PF 66000 EMC	11866153055 115 V, LT. Grey	18611600037			11.50 x 11.50 (292 x 292)	●	●	●	●
PF 67000 EMC	11867153055 115 V, LT. Grey	18611600037			11.50 x 11.50 (292 x 292)	●	●	●	●
PFA Series EMC Exhaust Filters									
PFA 10000 EMC	11710001055 (Lt. Grey)	18611600029	N/A	N/A	3.66 x 3.66 (93 x 93)	●	●	●	●
PFA 20000 EMC	11720004055 (Lt. Grey)	18611600034			4.96 x 4.96 (126 x 126)	●	●	●	●
PFA 30000 EMC	11730004055 (Lt. Grey)	18611600035			7.01 x 7.01 (178 x 178)	●	●	●	●
PFA 40000 EMC	11740004055 (Lt. Grey)	18611600036			8.82 x 8.82 (224 x 224)	●	●	●	●
PFA 60000 EMC	11760004055 (Lt. Grey)	18611600037			11.50 x 11.50 (292 x 292)	●	●	●	●



Superior metal shielding
Unequaled worldwide: contact surfaces without beryllium-copper seal!

Contact springs



No elaborate reworking of the cut-out

- No adhering of copper tape or similar aids
- No time-consuming scratching off of coatings in order to ensure a good contact
- Contact is made via the cut edge of the cut-out for the Filterfans® or exhaust filter

FILTERFAN® RAINHOODS

NEMA 3R/4/4X* WASHDOWN RAINHOODS



NEMA Rated Seal
Poured gasket eliminates the need for a secondary sealing gasket, ensuring a proper NEMA rated seal to the enclosure.

Easy Installation
The mounting bracket can easily be installed to the enclosure around the existing cut-out.

NEMA 3R/4 Design
This mounting system was designed to ensure a proper NEMA rating and protection when used with Pfannenbergs Filterfans® and exhaust filters.

Easy Maintenance
Easily remove the rain hood without tools for maintenance and filter mat replacement.
(Optional tamper resistant fasteners available to eliminate unauthorized access)

Maximized Airflow & Superior Overspray Protection
Direct spray barrier allows for superior protection from overspray entering the cabinet, **while only reducing airflow <7%.**

Rugged Steel Construction
Powder coated or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

NEMA 3R/4 or 4/4X Wash Down (WD) series Rainhoods for Filterfans®		
NEMA 3R/4 Model Number	Compatible with these 4th Gen FF	Part Number RAL 7035 (Light Grey)
PF-RH 20000-WD-LG	PF/PFA 2x000	18182000010
PF-RH 30000-WD-LG	PF/PFA 3x000	18182000013
PF-RH 40000-WD-LG	PF/PFA 4x000	18182000016
PF-RH 60000-WD-LG	PF/PFA 6x000	18182000019
NEMA 3R/4 Model Number	Compatible with these 4th Gen FF	Part Number ANSI 61 (Grey)
PF-RH 20000-WD-GY	PF/PFA 2x000	18182000009
PF-RH 30000-WD-GY	PF/PFA 3x000	18182000012
PF-RH 40000-WD-GY	PF/PFA 4x000	18182000015
PF-RH 60000-WD-GY	PF/PFA 6x000	18182000018
NEMA 4/4X Model Number	Compatible with these 4th Gen FF	Part Number 304 (Stainless Steel)
PF-RH 20000-WD-SS	PF/PFA 2x000	18182000011
PF-RH 30000-WD-SS	PF/PFA 3x000	18182000014
PF-RH 40000-WD-SS	PF/PFA 4x000	18182000017
PF-RH 60000-WD-SS	PF/PFA 6x000	18182000020

* Note: UL Type approval pending at time of publication



This technique will not prevent hazardous gases or humidity from entering the cabinet.

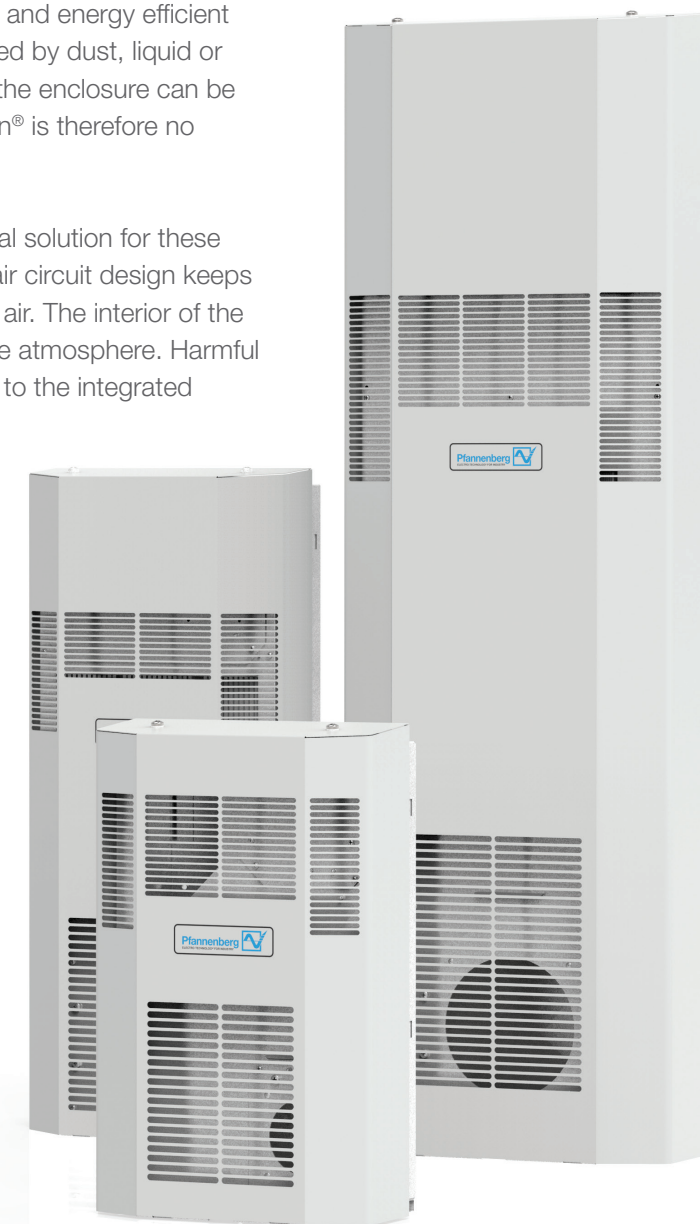
PAI 6043, 6133, 6203 Series **&COOL** Air/Air Heat Exchangers

Efficient Cooling with Ambient Air

Cooling with ambient air is the most economical and energy efficient type of cooling. When ambient air is contaminated by dust, liquid or gases, the components which are integrated in the enclosure can be damaged if contact occurs. The use of a Filterfan® is therefore no longer recommended.

Pfannenberger Air/Air Heat Exchangers are an ideal solution for these application areas with contaminated air. A dual air circuit design keeps complete separation of the internal and external air. The interior of the enclosure is thus hermetically separated from the atmosphere. Harmful dust, gas or fluids can no longer cause damage to the integrated components.

The robust steel construction of the air/air heat exchangers makes their operation in harsh industrial processes possible. Our **&COOL** products feature a maintenance friendly design. Installation and maintenance of these units requires much less time compared to other closed loop products. The **&COOL** Air/Air Heat Exchanger's feature an energy efficient, minimal maintenance design that is a proven solution in harsh environments.



THE TECHNOLOGY OF COOLING

Cooling with Closed Loop Air/Air Heat Exchangers

Air to air heat exchangers are used when the complete separation between the enclosure and the environment is required and the internal enclosure temperature to be cooled can be higher than the ambient. The air to air units have a rating showing how much heat can be removed based on the difference in the ambient and the internal temperatures. This is traditionally rated on W/°C which is the **watts of heat that the unit can remove per temperature difference in °C**.

How do I know if an air to air heat exchanger is the right product for my application?

- If the temperature inside the enclosure can be higher than the ambient.
- If a total separation between ambient air and enclosure air is required.

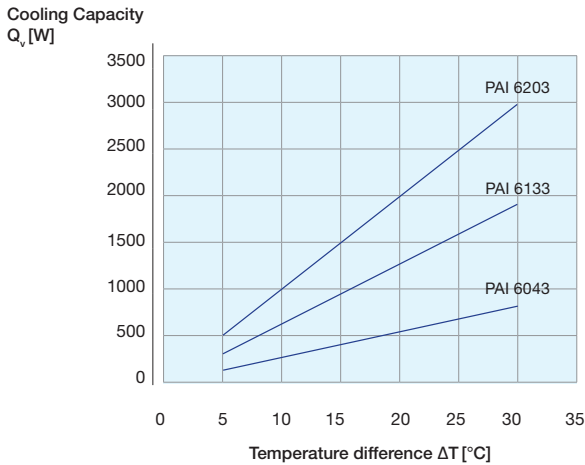
Properly sizing an air to air heat exchanger

To properly size an air to air heat exchanger you must know the **required cooling capacity in Watts, target temperature rise over ambient and the dimensions of the heat exchanger and enclosure**.

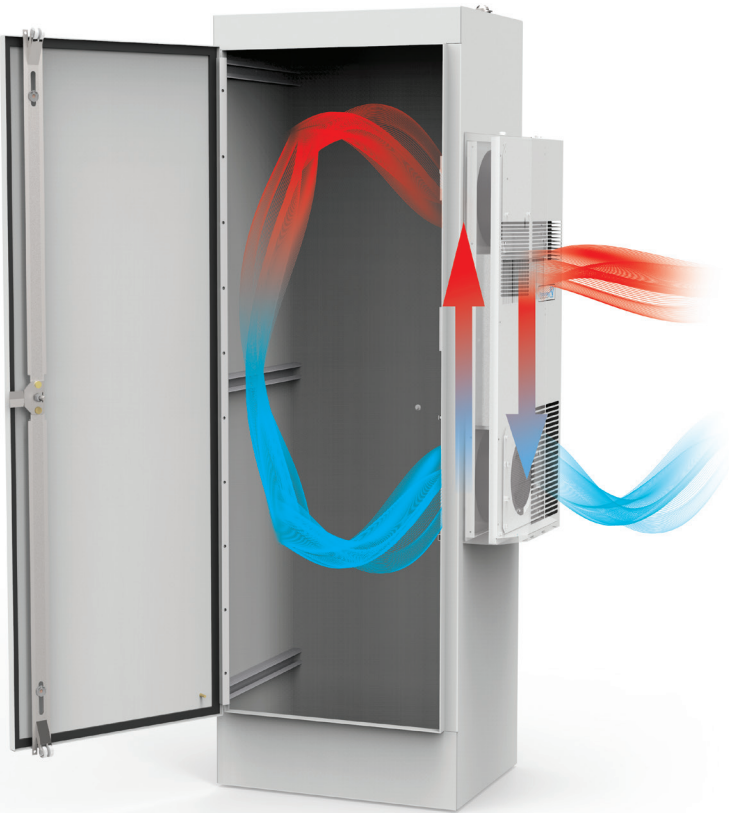
$$\{Q_v = q_w \times \Delta T\}$$

- **Q_v [Watt]:**
Total performance of air to air heat exchanger.
- **ΔT[°C]:**
Difference in temperature between the ambient air and the air inside the electronics cabinet.
- **q_w [Watts/ °C]:**
Specific cooling capacity of the air to air heat exchanger.

Utilizing performance curves to properly size air/air heat exchangers:
Pfannenbergl utilizes watts of heat that the unit can remove per temperature difference in °C. Customers should use their own application temperatures to determine the proper cooling capacity of the system.



- Important information when utilizing air/air heat exchangers:**
- The max ambient is 35 °C (95 °F) and the max internal temperature that the system can take is 45 °C (113 °F).
 - Can be used when the temperature difference is 10 °C.
 - If you apply this temperature difference to the rating of the air to air unit you will get the total amount of heat that can be removed.
 - A unit rated 100 W/°C could remove 1000 Watts (100 x 10) of heat under these conditions.



AIR/AIR HEAT EXCHANGERS QUICK SELECTION CHART

Type	Specific cooling capacity	Rated voltage	Dimensions (HxWxD) inches (mm)	Approvals				Page
				UR	cUR	CSA	CE	
PAI 6043	20 W/°C	115 V	24.09 x 14.96 x 8.35 (612 x 380 x 212)	●	●	○	●	32-33
PAI 6133	65 W/°C	115 V	36.73 x 16.14 x 7.83 (933 x 410 x 199)	●	●	○	●	
PAI 6203	100 W/°C	115 V	60.98 x 19.09 x 14.65 (1549 x 485 x 252)	●	●	○	●	

● available
○ pending

Cut-out compatibility with DTI series cooling units

Components in the enclosure are often updated and the requirements to thermal management change. An air/air heat exchanger which was previously the optimal solution is not suitable any more. The refitting of an active **ECOOL** cooling unit can be carried out easily and without problems, because the units have the same cut-out dimensions. Thus, the process stability is also ensured after extensive modifications.

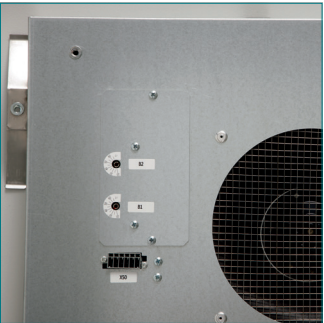


DTI Cooling Unit PAI Air/Air Heat Exchanger

Why Pfannenbergl PAI Air to Air Heat Exchangers



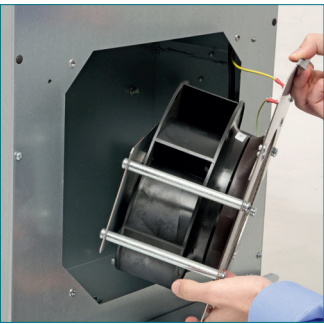
- Tool-free assembly for partially recessed mounting.
- Tried and tested partially recessed mounting.
- Integrated handles makes it possible for one mechanic to assemble the device.
- Assembly possible in less than 3 minutes.
- Simple color matching.
- Robust front design.



- Temperature can be adjusted using the primary mechanical thermostat.
- The secondary thermostat can be used for an alarm, making optimal adjusting of the alarm limit possible.



- Tool-free retrofit of filter adapter.
- Tool-free filter change.
- Filter can be changed in less than one minute.



- Maintenance friendly.
- All fans are easily accessible from the outside.
- Not necessary to open the enclosure.
- Fan can be replaced in less than 6 minutes.
- Secure selection via PSS software.

PAI 6043/6133/6203

AIR/AIR HEAT EXCHANGERS

20 - 100 W/°C

ECOOL

The PAI series ECOOL Air/Air Heat Exchangers are ideal for the replacement of a Filterfan® solution when the ambient air is too contaminated to enter the cabinet.

Available in 3 models; PAI 6043, PAI 6133 and PAI 6203, which are designed to be compatible with our European DTI Series cut-outs.

Energy Efficient
Ambient air is used for the thermal management of the enclosure.

Maintenance Free
Complete separation of the internal and external air flow and robust steel construction adapted to most environments (dust, solid particulate, vapors ...).

Rugged Design
One piece steel cover design for manufacturing environments which protects internal components.

Easy Electrical Installation
Pluggable connection allows for wiring to be done before the unit is installed.

Space Saving Integrated Design
Units have minimal depth off enclosure making door mounting feasible.

Easy Mechanical Installation
Tool free mounting. Can be mounted by one person with our spring plate design. This unit also features a mounting-friendly seal, no elaborate reworking of the mounting cut-out.

Optimized Airflow Design
Long air path design efficiently delivers cool air below the critical components while removing damaging hot air from the top of the enclosure. The high volume of air flow will eliminate hot spots.

Integrated Thermostats
Primary mechanical thermostat can be used to adjust temperature, saving energy. The secondary thermostat can be used as an independent alarm set point.

Filterless Design
Maintenance time can be minimized due to the wider fin spacing of the heat exchanger. If required a filter can be added to the unit at any time for more protection in harsh environments.

Reduced Fan Maintenance
Life expectancy of fans exceed industry standards. When replacement is required both fans can be removed from exterior to avoid lock out for maintenance and reduced MTTR.

PAI 6043/6133/6203 Series (20 - 100 W/°C) ECOOL Air/Air Heat Exchangers

Model Number	Part Number RAL 7035 (Light Grey)*	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Current Consumption A	Specific Cooling Capacity (W/°C)	Noise Level (according to EN ISO 3741) dB(A)	Width (in)	Depth (in)	Height (in)	Weight (without packaging) lb (kg)
PAI 6043	12991114055	115	60	56	0.52	20	<63	14.96	5.98	24.09	33.5 (15.2)
Design	Housing: galvanized sheet steel Cover: galvanized/electrostatically powder coated (200 °C)										
PAI 6133	12992414055	115	60	420	3.6	65	<71	16.14	7.56	36.73	52.8 (24)
Design	Housing: galvanized sheet steel Cover: galvanized/electrostatically powder coated (200 °C)										
PAI 6203	12993614055	115	60	420	3.4	100	<69	19.09	9.92	60.98	46 (20.9)
Design	Housing: galvanized sheet steel Cover: galvanized/electrostatically powder coated (200 °C)										

Additional Data		PAI 6043	PAI 6133	PAI 6203	
Ambient Temperature Range		- 25 ... + 55/ - 13 ... + 131			°F / °C
Control range (adjustable)	Control Thermostat	+ 20 ... + 55 / + 68 ... + 131; factory setting + 35 / + 95			
	Alarm Thermostat	+ 30 ... + 65 / + 86 ... + 149; factory setting + 45 / + 113			
Protection system according to EN 60529	IP 54	towards the electrical enclosure if used as intended by the manufacturer			
	IP 34	towards the surroundings if used as intended by the manufacturer			
Accessories		Piece	Part Number		
Filter Adapter (RAL 7035)		1	18060200000 / 18060200001 / 18310000151		
Fibermat Filter		5	18066100000 / 18066100001 / 18300000147		

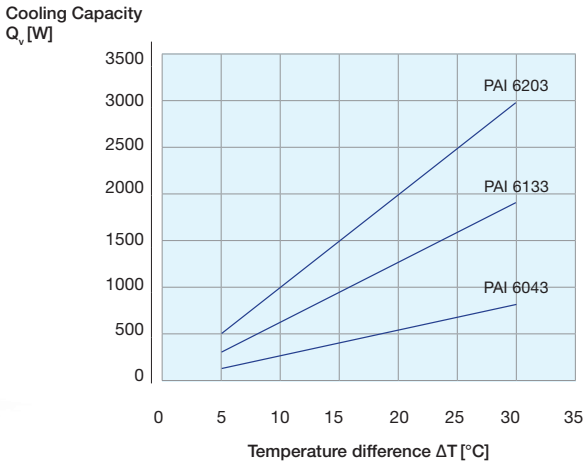
For additional technical data, drawings and templates. www.pfannenberguna.com

Available Models:



PAI 6043 Indoor Rated PAI 6133 Indoor Rated PAI 6203 Indoor Rated

Cooling Capacity Performance Curve



*Note: The size listed on this page is for the PAI 6133. Please see the chart on the opposite page for the dimensions of our PAI 6043 and PAI 6203 Models.

DTS 3000, DTT 6000 & DTI 6000 Series Cooling Units

Thermal Protection for Critical Electronics

Utilize closed loop cooling in tough industrial or outdoor applications with Pfannenberger's 'service-friendly' cooling units.

Pfannenberger's **DTS 3000 Series Cooling Units** are driven to meet the demands of our North American NEMA market. These units meet the needs on indoor NEMA Type 12 applications, NEMA Type 3R/4 outdoor applications and NEMA Type 4/4x stainless steel for washdown applications.

Pfannenberger's revolutionary designed **DTT Top Mount Cooling Units** offer unique protection through our innovative, patented condensate management system. These units can be safely installed above critical components with peace of mind.

The **DTI 6000 Series** allows for European-style recessed mounting on enclosure doors and/or side panels on modular systems. These "click & fit" units reduce installation times by more than 90%.



THE TECHNOLOGY OF COOLING

Cooling with Closed Loop Cooling Units

Pfannenbergl cooling units operate on the principle of the Carnot cycle. This means that the cooling unit functions as a heat pump that “pumps” the thermal energy transferred from the electronic cabinet (heat dissipated from the components) up to a higher level of temperature (the ambient temperature can reach levels as high as + 55 °C). The air inside the enclosure is cooled down by the evaporator and at the same time dehumidified.

How do I know if a cooling unit is the right product for my application?

- If the ambient temperature is greater than the target internal temperature of the enclosure, active cooling is required.
- If a NEMA Type 12 to 4x rating is required - closed loop systems can maintain the NEMA Type rating of the cabinet.

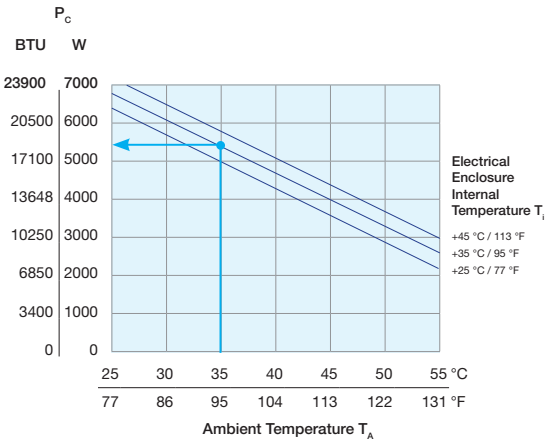
Properly sizing a cooling unit

To properly size a cooling unit you must know the required cooling capacity in Watts, mounting requirements (side, integrated or top mount) and the dimensions of the cooling unit and enclosure.

{P_C = P_D - P_R} {P_R = C x A x ΔT}

- **P_C [Watt]:**
Refrigeration capacity of a cooling unit.
- **C [W/m²°C]:**
Coefficient of heat transmission.
- **P_D [Watt]:**
Dissipation loss: Thermal power generated inside a cabinet by the dissipation loss of components.
- **A [m²]:**
Surface area of electronics cabinet.
- **ΔT [°C]:**
Difference in temperature between the ambient air and the air inside the electronics cabinet.
- **P_R [Watt]:**
Radiant heat gain/loss: Heat transfer through the skin of the enclosure (insulation factor not included).

Utilizing performance curves to properly size cooling units:
Pfannenbergl utilizes the DIN standard 35/35 °C when rating our cooling units. Many other companies use 50/50 °C, which provides a higher, non-usable value. Customers should use their own application temperatures to determine the proper cooling capacity of the system.



Note: Cooling capacity may vary between voltage and configurations.

Important information when utilizing cooling units:

- The refrigeration capacity should exceed the dissipation loss from the installed components by approximately 10%.
- The enclosure should be sealed to prevent the inflow of ambient air.
- Use the door contact switch to impede operation with open doors and consequent excessive accumulation of condensation.
- Use cooling units with maximum clearance between air inflow and air outflow to prevent poor circulation.
- Make sure that the air inflow and air outflow in the external circuit is not hindered, preventing proper heat exchanging at the condenser.
- When using top-mounted cooling units, make sure that components with their own fans do not expel the air directly into the cooling units cool air outflow.
- Make sure unit is level.
- Setting the temperature to the lowest setting is not the optimal solution due to the condensation issues. The value we have preset on the cooling unit is a sound compromise between cooling the inside of the enclosure and the accumulation of condensation.



COOLING UNITS QUICK SELECTION CHART

Type	Cooling Capacity Btu/h	Rated Voltage	Dimensions H x W x D Inches (mm)	Approvals				Page
				UL	cUL	UR	CE	
DTS Series Indoor Side Mount NEMA Type 12 Cooling Units								
DTS 3021	900 - 1300	115 V / 230 V	15.5 (393.7) x 7 (177.8) x 7.53 (191.4)	●	●		●	38
DTS 3041	2000 - 3000	115 V / 230 V	20.15 (512) x 10 (254) x 10.8 (274)	●	●		●	40
DTS 3141	3000 - 4000	115 V / 230 V / 400/460 V	29.46 (748) x 15.55 (395) x 9.3 (237)	●	●		●	42
DTS 3141 SL	3000 - 5000	115 V / 230 V / 400/460 V	36 (914) x 12 (305) x 12 (304)	●	●		●	44
DTS 3145	5000 - 7000	115 V / 230 V / 400/460 V	36 (914) x 12 (305) x 12 (304)	●	●		●	46
DTS 3241	7000 - 8500	115 V / 230 V / 400/460 V	47.60 (1209) x 15.6 (395) x 10.6 (269)	●	●		●	48
DTS 3245	9000 - 12000	115 V / 230 V / 400/460 V	53 (1347) x 16 (406) x 11.9 (301)	●	●		●	50
DTS 3441	15000 - 20000	230 V / 400/460 V	56.75 (1440) x 16 (406) x 16 (405)	●	●		●	52
DTS 3641	20000 - 24000	230 V / 400/460 V	65.5 (1665) x 19 (485) x 20.5 (520)	●	●		●	54
DTS Series Outdoor Cooling Units - NEMA Type 3R/4								
DTS 3031	900 - 1300	115 V / 230 V	15.5 (393.7) x 7 (177.8) x 7.53 (191.4)	●	●		●	38
DTS 3061	2000 - 3000	115 V / 230 V	20.15 (512) x 10 (254) x 10.8 (274)	●	●		●	40
DTS 3161	3000 - 4000	115 V / 230 V / 400/460 V	29.46 (748) x 15.55 (395) x 11.55 (294)	●	●		●	42
DTS 3161 SL	3000 - 5000	230 V / 400/460 V	36 (914) x 12 (305) x 14.4 (366.2)	●	●		●	44
DTS 3165	5000 - 7000	115 V / 230 V / 400/460 V	36 (914) x 12 (305) x 14.5 (368.3)	●	●		●	46
DTS 3261	7000 - 8500	115 V / 230 V / 400/460 V	47.1209 (1209) x 15.55 (395) x 12.83 (326)	●	●		●	48
DTS 3265	9000 - 12000	115 V / 230 V / 400/460 V	53 (1347) x 16.2 (411) x 14.4 (365.2)	●	●		●	50
DTS 3461	15000 - 20000	230 V / 400/460 V	56.75 (1440) x 16 (406) x 16 (405)	●	●		●	52
DTS 3661	20000 - 24000	230 V / 400/460 V	65.5 (1665) x 19 (485) x 24.5 (620)	●	●		●	54
DTS Series Washdown Cooling Units - NEMA Type 4/4X								
DTS 3031 SS	900 - 1300	115 V / 230 V	15.5 (393.7) x 7 (177.8) x 7.53 (191.4)	●	●		●	38
DTS 3081	2000 - 3000	115 V / 230 V	20.15 (512) x 10 (254) x 10.8 (274)	●	●		●	40
DTS 3181	3000 - 4000	115 V / 230 V / 400/460 V	29.45 (748) x 15.55 (395) x 11.55 (294)	●	●		●	42
DTS 3181 SL	3000 - 5000	230 V / 400/460 V	36 (914) x 12 (305) x 14.4 (366.2)	●	●		●	44
DTS 3185	5000 - 7000	115 V / 230 V / 400/460 V	36 (914) x 12 (305) x 14.5 (368.3)	●	●		●	46
DTS 3281	7000 - 8500	115 V / 230 V / 400/460 V	47 (1209) x 15.55 (395) x 12.83 (326)	●	●		●	48
DTS 3285	9000 - 12000	115 V / 230 V / 400/460 V	53 (1347) x 16.2 (411) x 14.4 (365.2)	●	●		●	50
DTS 3481	15000 - 20000	230 V / 400/460 V	56.75 (1440) x 16 (406) x 19 (484.5)	●	●		●	52
DTS 3681	20000 - 24000	230 V / 400/460 V	65.5 (1665) x 19 (485) x 24.5 (620)	●	●		●	54
DTI Series Integrated/Recessed (European)								
DTI 6201 C	3000-4000	230 V / 400/460 V	37.87 (962) x 16.14 (410) x 9.57 (243)			●	●	58
DTI 6301 C	5000-6000	230 V / 400/460 V	37.87 (962) x 16.14 (410) x 9.57 (243)			●	●	58
DTI 6201	3000 - 4000	230 V / 400/460 V	60.47 (1536) x 19.09 (485) x 8.58 (218)			●	●	60
DTI 6301	5000 - 6000	230 V / 400/460 V	60.47 (1536) x 19.09 (485) x 8.58 (218)			●	●	60
DTI 6401	7000 - 8000	400/460 V	60.47 (1536) x 19.09 (485) x 10.94 (278)			●	●	62
DTI 6501	9000 - 11000	400/460 V	60.47 (1536) x 19.09 (485) x 10.94 (278)			●	●	62
DTI 6801	13000 - 16000	400/460 V	60.59 (1539) x 19.09 (485) x 14.64 (372)			●	●	64
DTT Series Top Mount NEMA 12 Cooling Units								
DTT 6101	1200 - 2000	115 V / 230 V	17.13 (435) x 23.43 (595) x 15.55 (395)			●	●	68
DTT 6201	2500 - 4000	115 V / 230 V / 400/460 V	17.13 (435) x 23.43 (595) x 15.55 (395)			●	●	68
DTT 6301	4000 - 5500	115 V / 230 V / 400/460 V	17.13 (435) x 23.43 (595) x 19.49 (495)			●	●	70
DTT 6401	5500 - 7000	115 V / 230 V / 400/460 V	17.13 (435) x 23.43 (595) x 19.49 (495)			●	●	70
DTT 6601	7000 - 10000	400/460 V	19.09 (485) x 31.30 (795) x 22.64 (575)			●	●	72
DTT 6801	12000 - 14000	400/460 V	19.09 (485) x 31.30 (795) x 22.64 (575)			●	●	72

● available



DTS 3021/31/SS | COOLING UNITS

900 - 1300 Btu/h

The DTS 3021/31/SS series cooling units are ideal for small enclosures and for the cooling of hot spots in larger control cabinets. These units are particularly suited for the food industry and outdoor applications. Available in 3 models; **DTS 3021 (NEMA Type 12)** for indoor use, **DTS 3031 (NEMA Type 3R/4)** designed for outdoor use, and the stainless steel **DTS 3031 SS (NEMA Type 4/4x)** designed for wash-down applications.

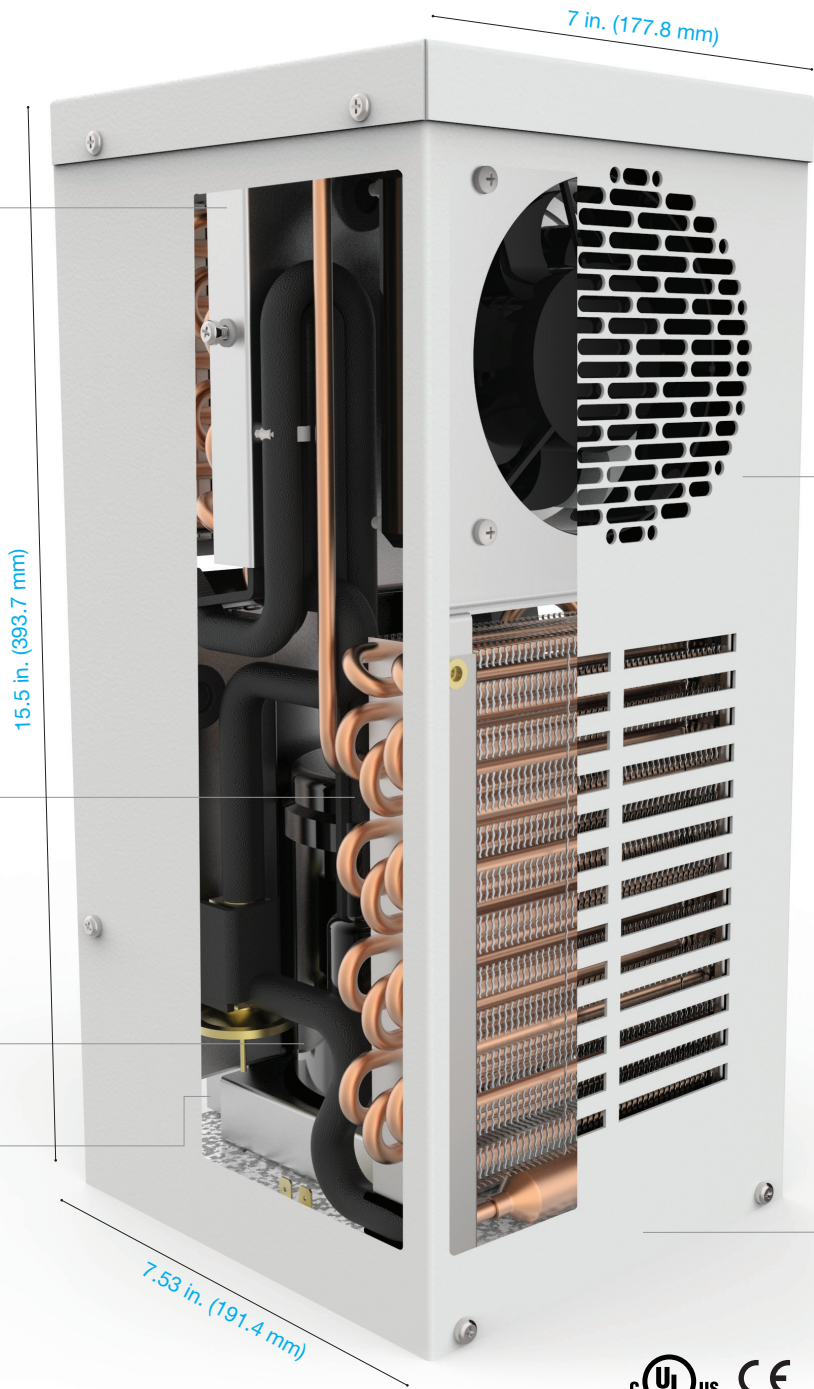
Closed Loop Design
Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

Thermal Overload Protection
Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

Thermal Expansion Valve
Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Hermetically Sealed Compressor
The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.

Condensate Drain Port
Permits effective collection and drainage of condensation.



ERP Efficiency Certified
As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberger proudly utilizes components which adhere to these requirements.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Environmentally Friendly
Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

Highest in Class Capacity
The compact, 7 inch width is ideal for small enclosures with a relatively small heat load.



DTS 30X1 Series (900 - 1300 Btu/h) Side-Mount Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current* @ 35A/35A °C	Fuse (maximum)** Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTS 3021 Indoor Rated (NEMA Type 12)	13383144255	115	60	243	2.1	15	<64	30 (13.6)
	13383141255	230	50/60	253	1.2	15	<64	30 (13.6)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251							
DTS 3031 Outdoor Rated (NEMA Type 3R/4)	13383144355	115	60	243	2.1	15	<64	30 (13.6)
	13383141355	230	50/60	253	1.2	15	<64	30 (13.6)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...351							
DTS 3031 SS Washdown (NEMA Type 4/4x)	13383144158	115	60	243	2.1	15	<64	30 (13.6)
	13383141158	230	50/60	253	1.2	15	<64	30 (13.6)
Design	Housing: stainless steel 304 Cover: stainless steel 304							

Additional Data		DTS 3021	DTS 3031	DTS 3031 SS	
Ambient Temperature Range		+ 46 ... + 114/ + 8 ... + 45			°F / °C
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 40; factory setting + 95 / + 35			
Refrigerant	type	R134a			
	quantity	145 - 150			g
Condensate management		condensate drain			
Protection system according to NEMA Type	12	3R/4	4/4X	against enclosure when properly installed	
	NEMA 1 towards the surroundings when properly installed				
Accessories		For spare part kits and additional accessories visit pgs. 74-75 in this catalog			

* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

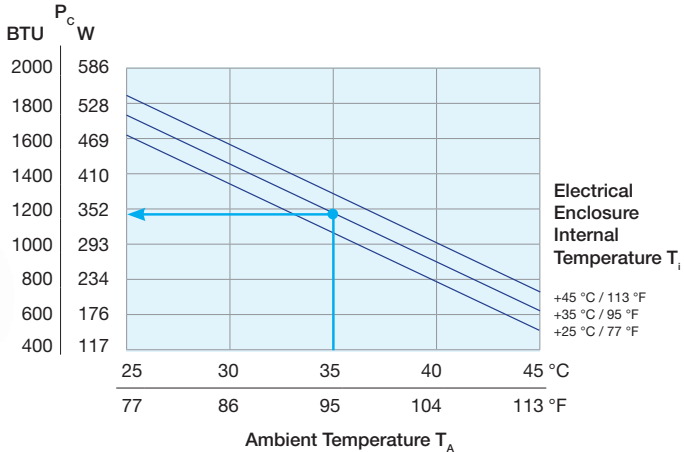
For additional technical data, drawings and templates. www.pfannenberguna.com

Available Models:



Cooling Capacity Performance Curve

How to use this chart
Example: @ 95 °F (ambient, X-axis), @ 95 °F (internal, diagonal lines) = 1194 Btu/h cooling capacity (Y-axis)



Note: Cooling capacity may vary between voltage and configurations.

DTS 30X1 | COOLING UNITS
2000 - 3000 Btu/h

The DTS 30X1 series cooling units are ideal for small enclosures and for the cooling of hot spots in larger control cabinets. These units are particularly suited for the food industry and outdoor applications. Available in 3 models; DTS 3041 (NEMA Type 12) for indoor use, DTS 3061 (NEMA Type 3R/4) designed for outdoor use, and the stainless steel DTS 3081 (NEMA Type 4/4x) designed for wash-down applications.

Closed Loop Design
Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

Thermal Overload Protection
Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

Pressure Overload Protection
High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Thermal Expansion Valve
Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Hermetically Sealed Compressor
The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.

ERP Efficiency Certified
As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberger proudly utilizes components which adhere to these requirements.

Environmentally Friendly
Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

High Airflow Backward Curve Impeller Fan
Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.

Highest in Class Capacity
The compact, 10 inch width is ideal for small enclosures with a relatively small heat load. The integral power cord helps simplify installation. An integral ingress filter is provided on type 12/3R/4 versions.

Corrosion Protection
Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.

Optimized Condenser Designs
The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

High Ambient Performance
The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F. High ambient options are also available to 140° F.

Easy to Maintain
Both the indoor and outdoor 30X1 cooling units include an integrated Pfannenberger PFA Exhaust Filter for simple replacement of the filter.



DTS 30X1 Series (2000 - 3000 Btu/h) Side-Mount Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current* @ 35A/35A °C	Fuse (maximum)** Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTS 3041 Indoor Rated (NEMA Type 12)	13382344255	115	60	690	6.0	15	<64	51 (23)
	13382341255	230	50/60	663	4.1	15	<64	51 (23)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251							
DTS 3061 Outdoor Rated (NEMA Type 3R/4)	13382344355	115	60	690	5.2	15	<64	51 (23)
	13382341355	230	50/60	663	4.1	15	<64	51 (23)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...351							
DTS 3081 Washdown (NEMA Type 4/4x)	13382344300	115	60	690	5.2	15	<64	55 (25)
	13382341300	230	50/60	663	4.1	15	<64	55 (25)
Design	Housing: stainless steel 304 Cover: stainless steel 304							

Additional Data		DTS 3041	DTS 3061	DTS 3081		
Ambient Temperature Range		+ 46 ... + 114 / + 8 ... + 45		+ 46 ... + 131 / + 8 ... + 55		°F / °C
Control range (adjustable)		SC	+ 50 ... + 104 / + 10 ... + 40; factory setting + 95 / + 35			
Refrigerant	type	R134a				
	quantity	400				g
Condensate management		condensate drain				
Protection system according to NEMA Type	12	3R/4		4/4X		against enclosure when properly installed
	NEMA 1 towards the surroundings when properly installed					
Accessories		For spare part kits and additional accessories visit pgs. 74-75 in this catalog				

* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

For additional technical data, drawings and templates.
www.pfannenbergsusa.com

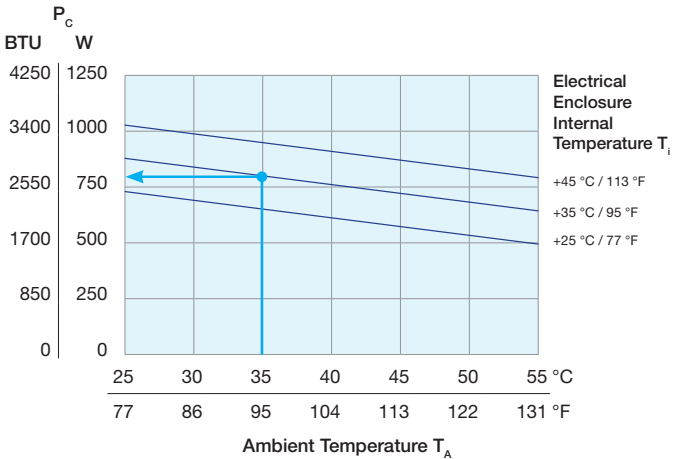
Available Models:



DTS 3041 Indoor Rated (NEMA Type 12)
DTS 3061 Outdoor Rated (NEMA Type 3R/4)
DTS 3081 Washdown (NEMA Type 4/4x)

Cooling Capacity Performance Curve

How to use this chart
Example: @ 95 °F (ambient, X-axis), @ 95 °F (internal, diagonal lines) = 2700 Btu/h cooling capacity (Y-axis)



Note: Cooling capacity may vary between voltage and configurations.

DTS 31X1

COOLING
UNITS

3000 - 4000 Btu/h

The DTS 31X1 series cooling units utilize a long internal air path to capture heat above the components and provide cool air below. Available in 3 models; **DTS 3141 (NEMA Type 12)** for indoor use, **DTS 3161 (NEMA Type 3R/4)** designed for outdoor use, and the stainless steel **DTS 3181 (NEMA Type 4/4x)** designed for washdown applications.

Closed Loop Design

Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

Thermal Overload Protection

Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

Environmentally Friendly

Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

Pressure Overload Protection

High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Hermetically Sealed Compressor

The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.

Corrosion Protection

Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.

Thermal Expansion Valve

Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

High Airflow Backward Curve Impeller Fan

Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.

ERP Efficiency Certified

As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements.

High Ambient Performance

The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Self Protected from Harsh Environments

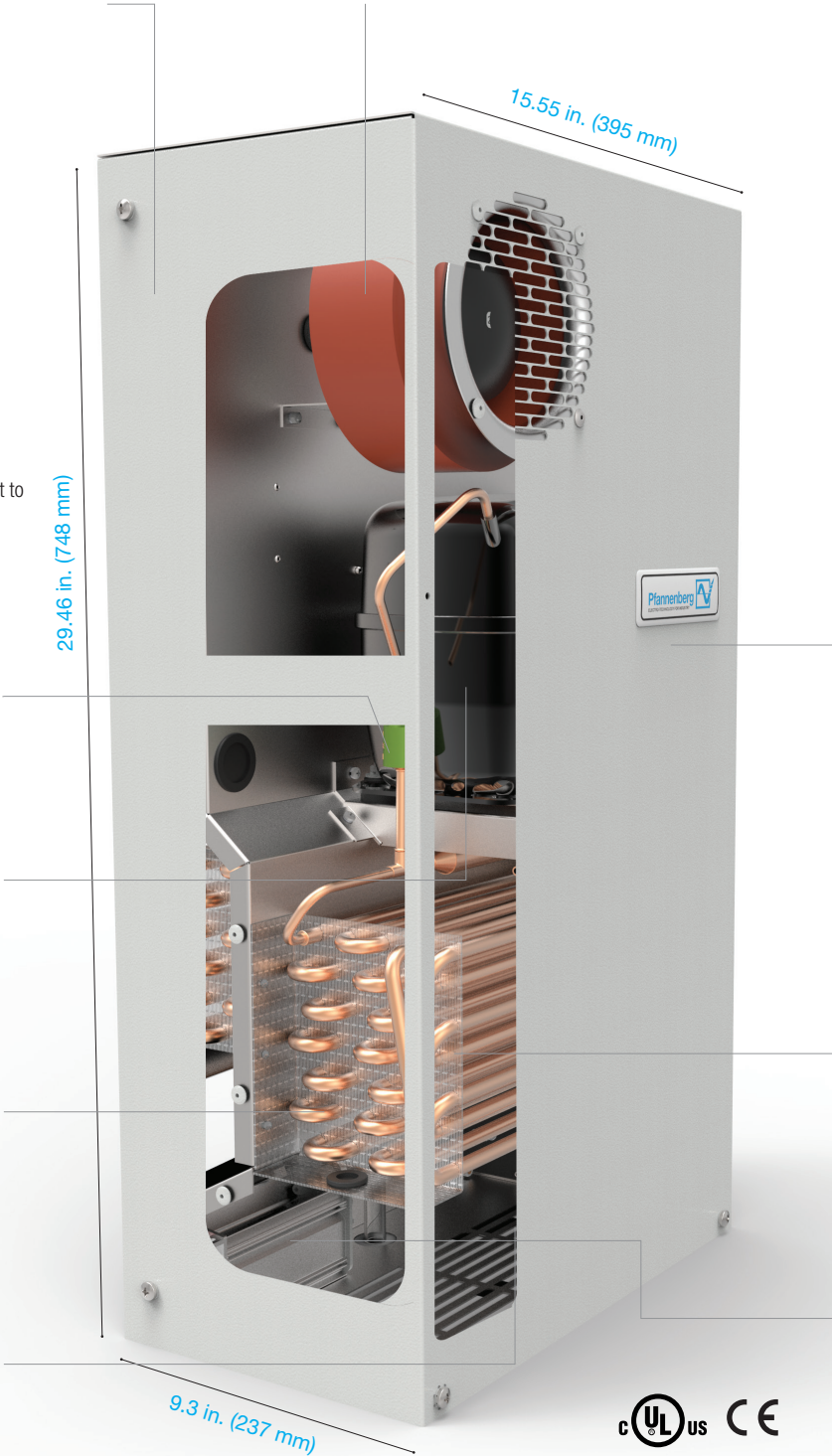
Our unit is uniquely designed to protect itself in NEMA 3R, 4, and 4X environments. An example of this is the location of our control electronics within our dry, cool interior circuit.

Maintenance Free, Filterless Design

The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.

Active Condensate Management

Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.



DTS 31X1 Series (3000 - 4000 Btu/h) Side-Mount Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current* @ 35A/35A °C	Fuse (maximum)** Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTS 3141 Indoor Rated (NEMA Type 12)	13385444255	115	60	845	7.0	15	<70	84 (38)
	13385441255	230	50/60	795	4.0	15	<70	84 (38)
	13385436255	400/460	50/60	1200	2.0	15	<70	88 (40)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251							
DTS 3161 Outdoor Rated (NEMA Type 3R/4)	13385444355	115	60	845	7.0	15	<70	89 (40)
	13385441355	230	50/60	795	4.0	15	<70	89 (40)
	13385436355	400/460	50/60	1200	2.0	15	<70	92 (42)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...351							
DTS 3181 Washdown (NEMA Type 4/4x)	13385444158	115	60	845	7.0	15	<70	92 (42)
	13385441158	230	50/60	795	4.0	15	<70	92 (42)
	13385436158	400/460	50/60	1200	2.0	15	<70	97 (44)
Design	Housing: stainless steel 304 Cover: stainless steel 304							

Additional Data		DTS 3141	DTS 3161	DTS 3181	
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55	+ 32 ... + 131 / + 0 ... + 55		°F / °C
Control range (adjustable) SC		+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35			
Refrigerant	type	R134a			
	quantity	400			g
Condensate management		active condensate evaporation system with safety overflow			
Protection system according to NEMA Type		12	3R/4	4/4X	against enclosure when properly installed
		NEMA 1 towards the surroundings when properly installed			
Accessories		For spare part kits and additional accessories visit pgs. 74-75 in this catalog			

* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

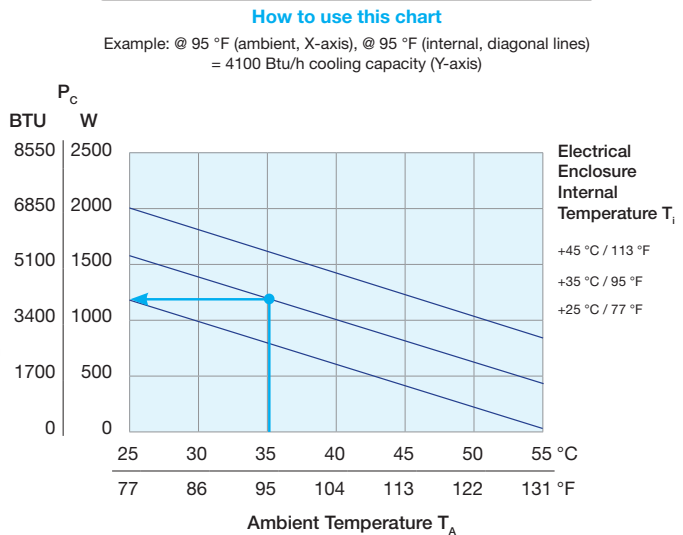


For additional technical data, drawings and templates. www.pfannenbergusa.com

Available Models:



Cooling Capacity Performance Curve



DTS 31X1SL | COOLING UNITS

3000 - 5000 Btu/h

The DTS 31X1SL series cooling units are designed to fit shallow enclosures vs 31X1 standard model. Available in 3 models; **DTS 3141 SL (NEMA Type 12)** for indoor use, **DTS 3161 SL (NEMA Type 3R/4)** designed for outdoor use, and the stainless steel **DTS 3181 SL (NEMA Type 4/4x)** designed for washdown applications.



Closed Loop Design

Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

High Ambient Performance

The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F.

Thermal Expansion Valve

Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Thermal Overload Protection

Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

Pressure Overload Protection

High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Active Condensate Management

Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

Hermetically Sealed Compressor

The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.

High Airflow Backward Curve Impeller Fan

Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.

ERP Efficiency Certified

As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Maintenance Free, Filterless Design

The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.

Corrosion Protection

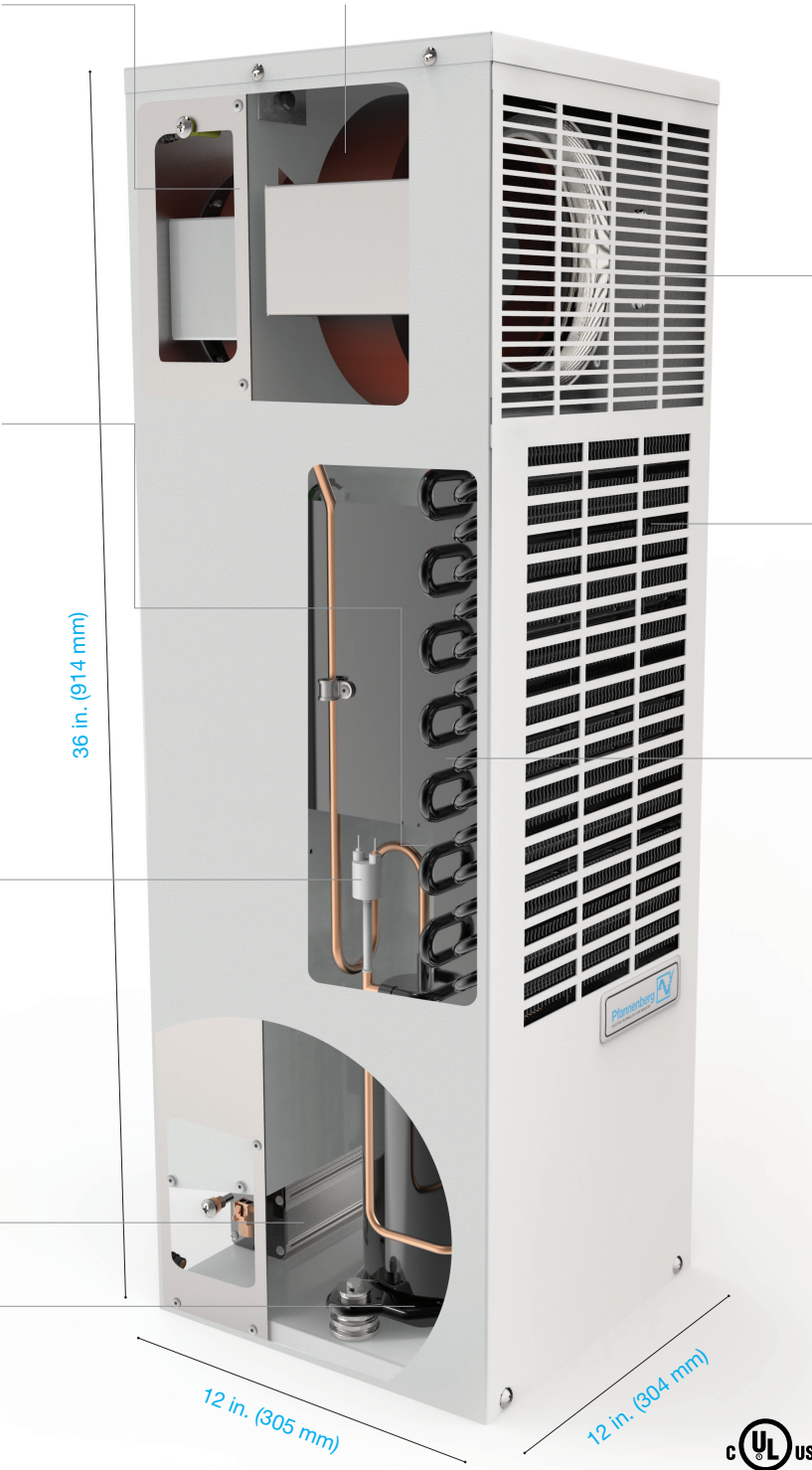
Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.

Environmentally Friendly

Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

Self Protected from Harsh Environments

Our unit is uniquely designed to protect itself in NEMA 3R, 4, and 4X environments. An example of this is the location of our control electronics within our dry, cool interior circuit.



DTS 31X1 SL Series (3000 - 5000 Btu/h) Side-Mount Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current* @ 35A/35A °C	Fuse (maximum)** Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTS 3141 SL Indoor Rated (NEMA Type 12)	13383444255	115	60	917	13.4	15	<70	108 (49)
	13383441255	230	50/60	890	6.6	15	<70	108 (49)
	13383436255	400/460	50/60	751	1.9	15	<70	108 (49)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251							
DTS 3161 SL Outdoor Rated (NEMA Type 3R/4)	13383441355	230	50/60	890	6.6	15	<70	108 (49)
	13383436355	400/460	50/60	751	1.9	15	<70	108 (49)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...351							
DTS 3181 SL Washdown (NEMA Type 4/4x)	13383441158	230	50/60	890	6.6	15	<70	108 (49)
	13383436158	400/460	50/60	751	1.9	15	<70	108 (49)
Design	Housing: stainless steel 304 Cover: stainless steel 304							

Additional Data		DTS 3141 SL	DTS 3161 SL	DTS 3181 SL	
Ambient Temperature Range	115 VAC	+ 59 ... + 113/ + 15 ... + 45	N/A	N/A	°F / °C
	460/230 VAC	+ 59 ... + 131/ + 15 ... + 55	+ 32... + 131 / + 0 ... + 55	+ 59 ... + 131 / + 15 ... + 55	
Control range (adjustable)	SC	+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35			
Refrigerant	type	R134a			
	quantity	900			g
Condensate management		active condensate evaporation system with safety overflow			
Protection system according to NEMA Type		12	3R/4	4/4X	against enclosure when properly installed
		NEMA 1 towards the surroundings when properly installed			
Accessories		For spare part kits and additional accessories visit pgs. 74-75 in this catalog			

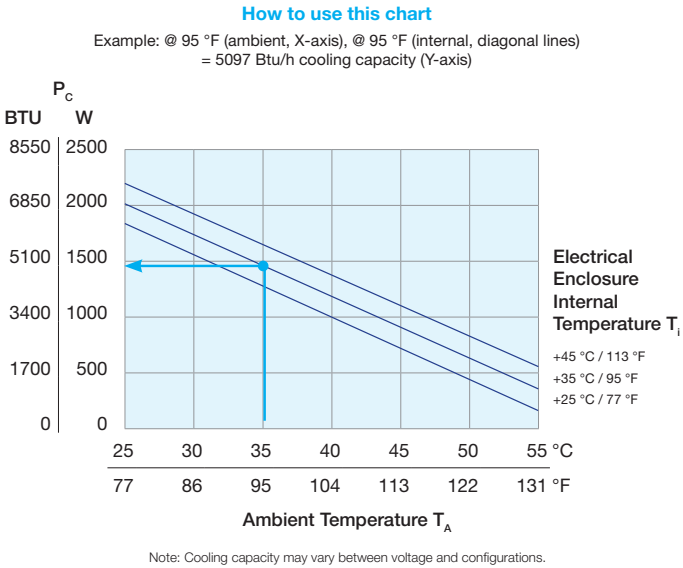
* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

For additional technical data, drawings and templates. www.pfannenbergusa.com

Available Models:



Cooling Capacity Performance Curve



DTS 31X5 | COOLING UNITS
5000 - 7000 Btu/h

Our DTS 31X5 cooling units are an ideal solution for a wide variety of applications. These units are particularly suited for compact enclosures and are available in 3 models; DTS 3145 (NEMA Type 12) for indoor use, DTS 3165 (NEMA Type 3R/4) designed for outdoor use, and the stainless steel DTS 3185 (NEMA Type 4/4x) designed for washdown applications. Available options include a low ambient package and enclosure heater.



ERP Efficiency Certified
As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements.

Phase Protection
Three-phase 400/460 VAC powered units are protected from phase mis-wiring.

Pluggable power connection
Easily made without opening the chassis.

Easy Access Control Panel
Electrical controls are easily accessible with the flip down access panel.

Pressure Overload Protection
High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Thermal Expansion Valve
Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Thermal Overload Protection
Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

Environmentally Friendly
Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

Active Condensate Management
Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

High Airflow Backward Curve Impeller Fan
Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.

Lifting Lug Ports
Threaded holes accommodate the installation of lifting lugs to facilitate safe installation.

Self Protected from Harsh Environments
Our unit is uniquely designed to protect itself in NEMA 3R, 4, and 4X environments. An example of this is the location of our control electronics within our dry, cool interior circuit.

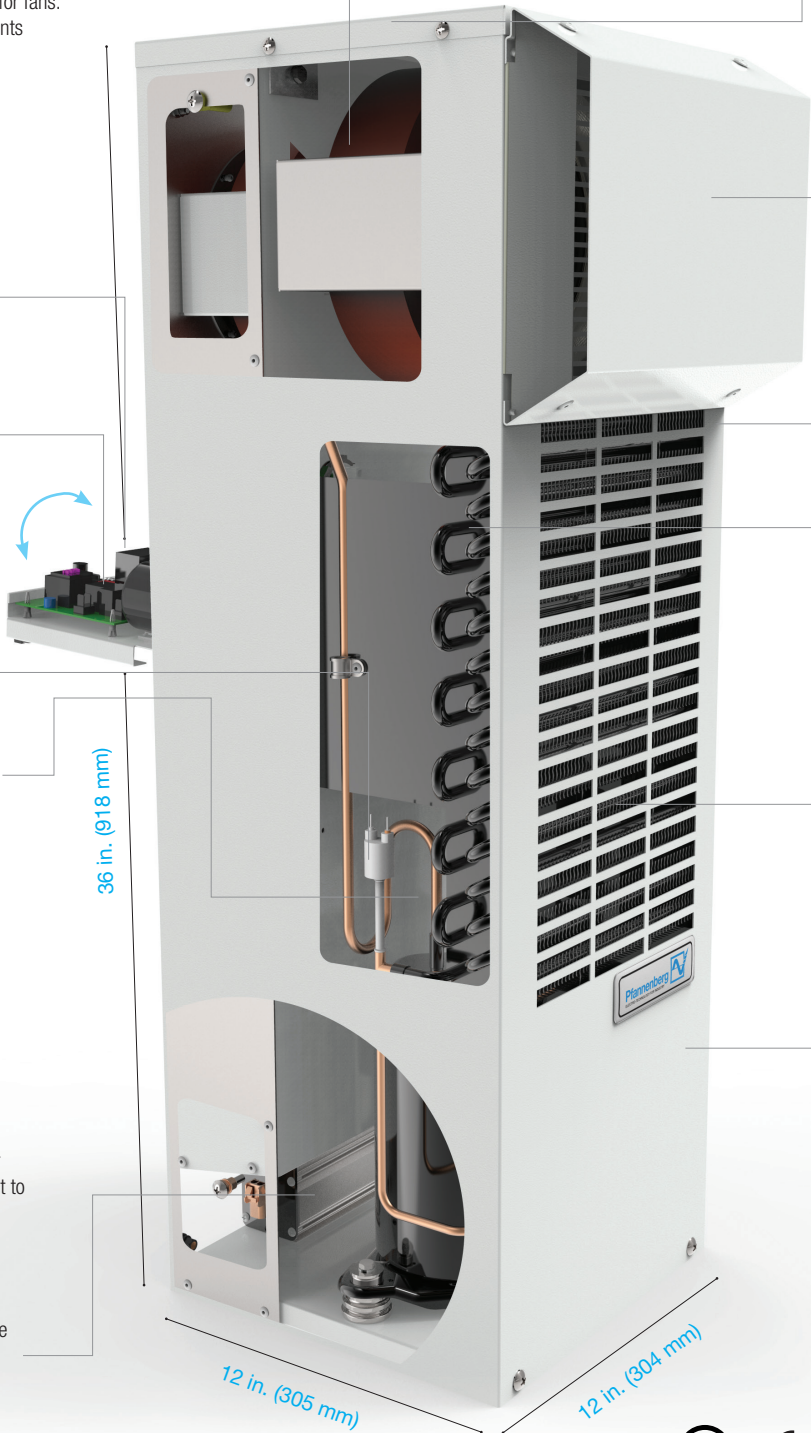
Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Corrosion Protection
Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.

Maintenance Free, Filterless Design
The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.

New Narrower Footprint
Compact design delivers high cooling capacity to enclosures as small as 12 inches (300mm) in width.

High Ambient Performance
The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F. High ambient options are also available to 140° F.



DTS 31X5 Series (5000 - 7000 Btu/h) Side-Mount Cooling Units

Table with 9 columns: Model Number, Part Number, Voltage (VAC), Frequency (Hz), Power Consumption (W), Nominal (Run) Current* @ 35A/35A °C, Fuse (maximum)** Class CC, Noise Level (according to EN ISO 3741) dB(A), Weight (without packaging) lb (kg). Rows include DTS 3145 Indoor Rated, DTS 3165 Outdoor Rated, and DTS 3185 Washdown with their respective specifications.

Table with 5 columns: Additional Data, DTS 3145, DTS 3165, DTS 3185, and a unit column. Rows include Ambient Temperature Range, Control range (adjustable), Refrigerant (type and quantity), Condensate management, Protection system according to NEMA Type, and Accessories.

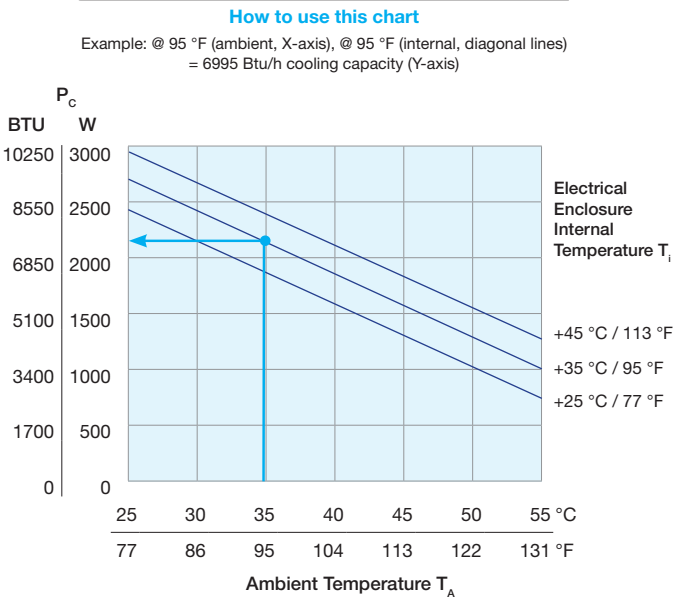
* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

For additional technical data, drawings and templates. www.pfannenberguna.com

Available Models:



Cooling Capacity Performance Curve



Note: Cooling capacity may vary between voltage and configurations.

DTS 32X1 | COOLING UNITS

7000 - 8500 Btu/h

The DTS 32X1 series cooling units utilize a long internal air path to capture heat above the components and provide cool air below. Available in 3 models; **DTS 3241 (NEMA Type 12)** for indoor use, **DTS 3261 (NEMA Type 3R/4)** designed for outdoor use, and the stainless steel **DTS 3281 (NEMA Type 4/4x)** ideal for washdown applications.

Closed Loop Design

Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

Thermal Overload Protection

Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

High Ambient Performance

The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F.

Hermetically Sealed Compressor

The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.

Pressure Overload Protection

High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Thermal Expansion Valve

Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Active Condensate Management

Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

High Airflow Backward Curve Impeller Fan

Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.

ERP Efficiency Certified

As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements.

Environmentally Friendly

Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

Self Protected from Harsh Environments

Our unit is uniquely designed to protect itself in NEMA 3R, 4, and 4X environments. An example of this is the location of our control electronics within our dry, cool interior circuit.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Maintenance Free, Filterless Design

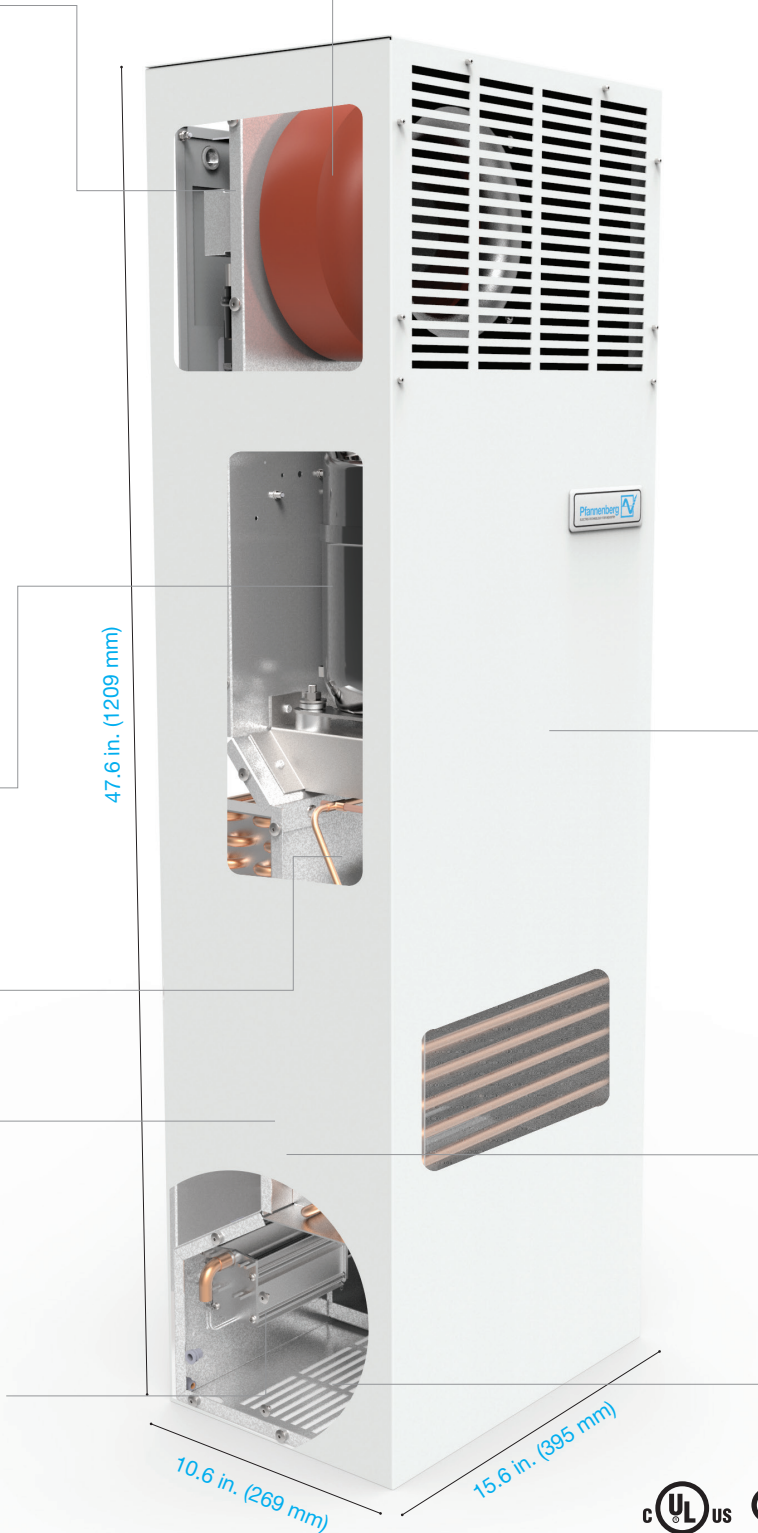
The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.

Corrosion Protection

Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.

Quiet Operation

Achieved with waste heat exhausted through the bottom.



DTS 32X1 Series (7000 - 8500 Btu/h) Side-Mount Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current* @ 35A/35A °C	Fuse (maximum)** Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTS 3241 Indoor Rated (NEMA Type 12)	13385744255	115	60	1680	7.2	25	<73	119 (54)
	13385741255	230	50/60	1425	6.2	15	<73	119 (54)
	13385736255	400/460	50/60	1400	2.0	15	<73	135.5 (61)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251							
DTS 3261 Outdoor Rated (NEMA Type 3R/4)	13385744355	115	60	1680	7.2	25	<73	123.5 (56)
	13385741355	230	50/60	1425	6.2	15	<73	123.5 (56)
	13385736355	400/460	50/60	1400	2.0	15	<73	139 (63)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...351							
DTS 3281 Washdown (NEMA Type 4/4x)	13385744158	115	60	1680	7.2	25	<73	132 (60)
	13385741158	230	50/60	1425	6.2	15	<73	132 (60)
	13385736158	400/460	50/60	1400	2.0	15	<73	148 (67)
Design	Housing: stainless steel 304 Cover: stainless steel 304							

Additional Data		DTS 3241	DTS 3261	DTS 3281	
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55	+ 32 ... + 131 / + 0 ... + 55		°F / °C
Control range (adjustable)		+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35			
Refrigerant	type	R134a			
	quantity	700			g
Condensate management		active condensate evaporation system with safety overflow			
Protection system according to NEMA Type		12	3R/4	4/4X	against enclosure when properly installed
		NEMA 1 towards the surroundings when properly installed			
Accessories		For spare part kits and additional accessories visit pgs. 74-75 in this catalog			

* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

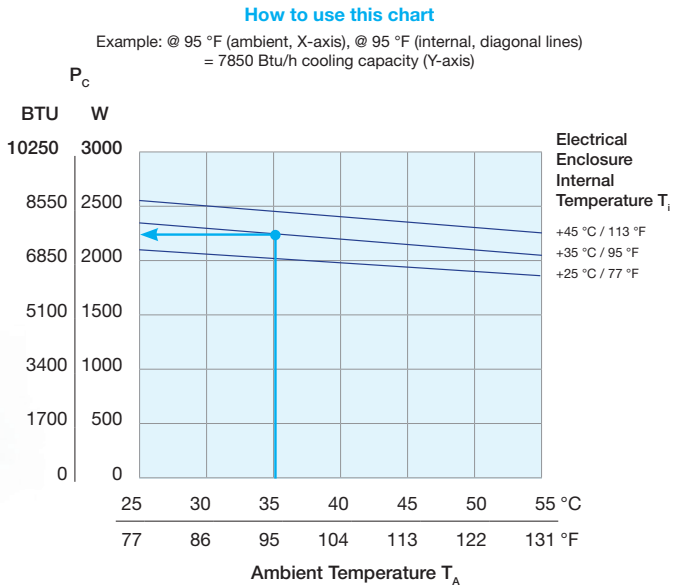
For additional technical data, drawings and templates. www.pfannenbergusa.com

Available Models:



DTS 3241 Indoor Rated (NEMA Type 12)
DTS 3261 Outdoor Rated (NEMA Type 3R/4)
DTS 3281 Washdown (NEMA Type 4/4x)

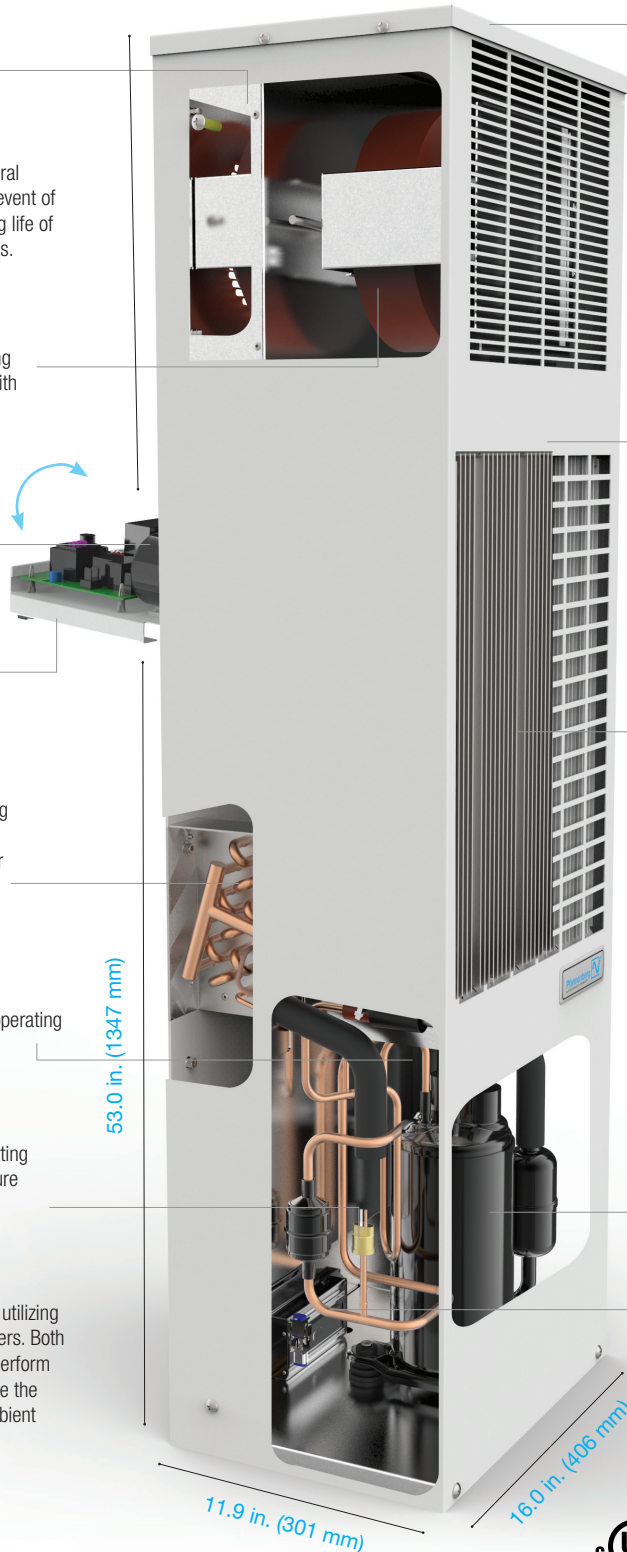
Cooling Capacity Performance Curve



DTS 32X5 | COOLING UNITS
10000 - 13000 Btu/h

The DTS 32X5 series cooling units are one of our most popular and versatile cooling units, newly redesigned with our efficient micro channel condenser. Cutout footprint is compatible with our older 12,000 Btu/h cooling units, allowing for easy upgrade or replacement. Available in 3 models; DTS 3245 (NEMA Type 12) for indoor use, DTS 3265 (NEMA Type 3R/4) designed for outdoor use, and the stainless steel DTS 3285 (NEMA Type 4/4x) designed for washdown applications.

- Closed Loop Design
Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.
- Thermal Overload Protection
Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.
- High Airflow Backward Curve Impeller Fan
Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.
- Pluggable power connection
Easily made without opening the chassis.
- Easy Access Control Panel
Electrical controls are easily accessible with the flip down access panel.
- Corrosion Protection
Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.
- Thermal Expansion Valve
Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.
- Pressure Overload Protection
High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.
- High Ambient Performance
The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F. High ambient options are also available to 140° F.



- Lifting Lug Ports
Threaded holes accommodate the installation of lifting lugs to facilitate safe installation.
- Environmentally Friendly
Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.
- Extra Protection from Water
The rain hood is a standard feature for NEMA 3R, 4, and 4X units. This hood provides protection from falling water and direct water sprays.
- Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.
- Micro Channel Condenser
Improves efficiency and durability.
- ERP Efficiency Certified
As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements.
- Hermetically Sealed Compressor
The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.
- Active Condensate Management
Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

DTS 32X5 Series (10000 - 13000 Btu/h) Side-Mount Cooling Units

Table with 9 columns: Model Number, Part Number, Voltage (VAC), Frequency (Hz), Power Consumption (W), Nominal (Run) Current*, Fuse (maximum)** Class CC, Noise Level (according to EN ISO 3741) dB(A), Weight (without packaging) lb (kg). Rows include DTS 3245 Indoor Rated, DTS 3265 Outdoor Rated, and DTS 3285 Washdown.

Table with 5 columns: Additional Data, DTS 3245, DTS 3265, DTS 3285, and a combined column for °F / °C. Rows include Ambient Temperature Range, Control range (adjustable), Refrigerant, Condensate management, Protection system according to NEMA Type, and Accessories.

* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

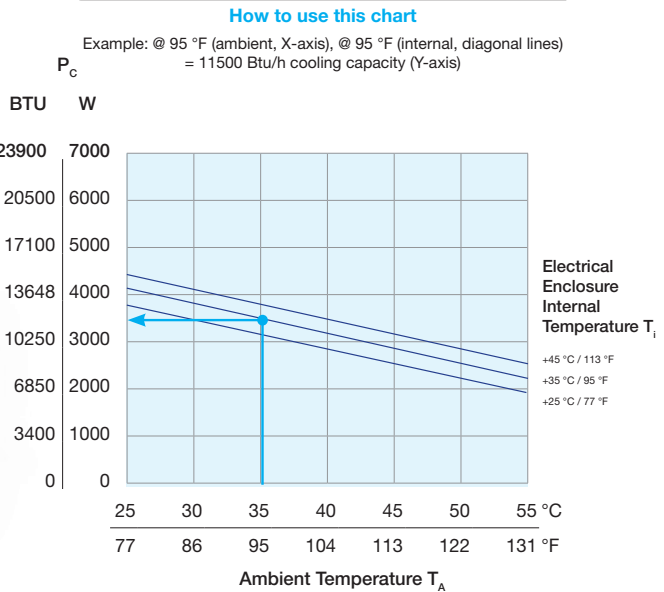
For additional technical data, drawings and templates.
www.pfannenbergusa.com

Available Models:



DTS 3245 Indoor Rated (NEMA Type 12)
DTS 3265 Outdoor Rated (NEMA Type 3R/4)
DTS 3285 Washdown (NEMA Type 4/4x)

Cooling Capacity Performance Curve



Note: Cooling capacity may vary between voltage and configurations.

DTS 34X1 | COOLING UNITS
15000 - 20000 Btu/h

The DTS 34X1 series cooling units have the highest power to cooling ratio available on the market. These units are ideal for high heat loads, especially high horsepower drive enclosures. Available in 3 models; DTS 3441 (NEMA Type 12) for indoor use, DTS 3461 (NEMA Type 3R/4) designed for outdoor use, and the stainless steel DTS 3481 (NEMA Type 4/4x) designed for washdown applications.

Closed Loop Design
Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

Dual Condenser Fans
Offer partial redundancy in a large capacity to size ratio. Micro channel condenser improves efficiency and durability.

Phase Protection
Three-phase 400/460 VAC powered units are protected from phase mis-wiring.

Pluggable power connection
Easily made without opening the chassis.

Easy Access Control Panel
Electrical controls are easily accessible with the flip down access panel.

High Ambient Performance
The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F.

Pressure Overload Protection
High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Thermal Expansion Valve
Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Corrosion Protection
Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.

Extra Protection from Water
The rain hood is a standard feature for NEMA 3R, 4, and 4X units. This hood provides protection from falling water and direct water sprays.

Lifting Lug Ports
Threaded holes accommodate the installation of lifting lugs to facilitate safe installation.

Thermal Overload Protection
Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

Environmentally Friendly
Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

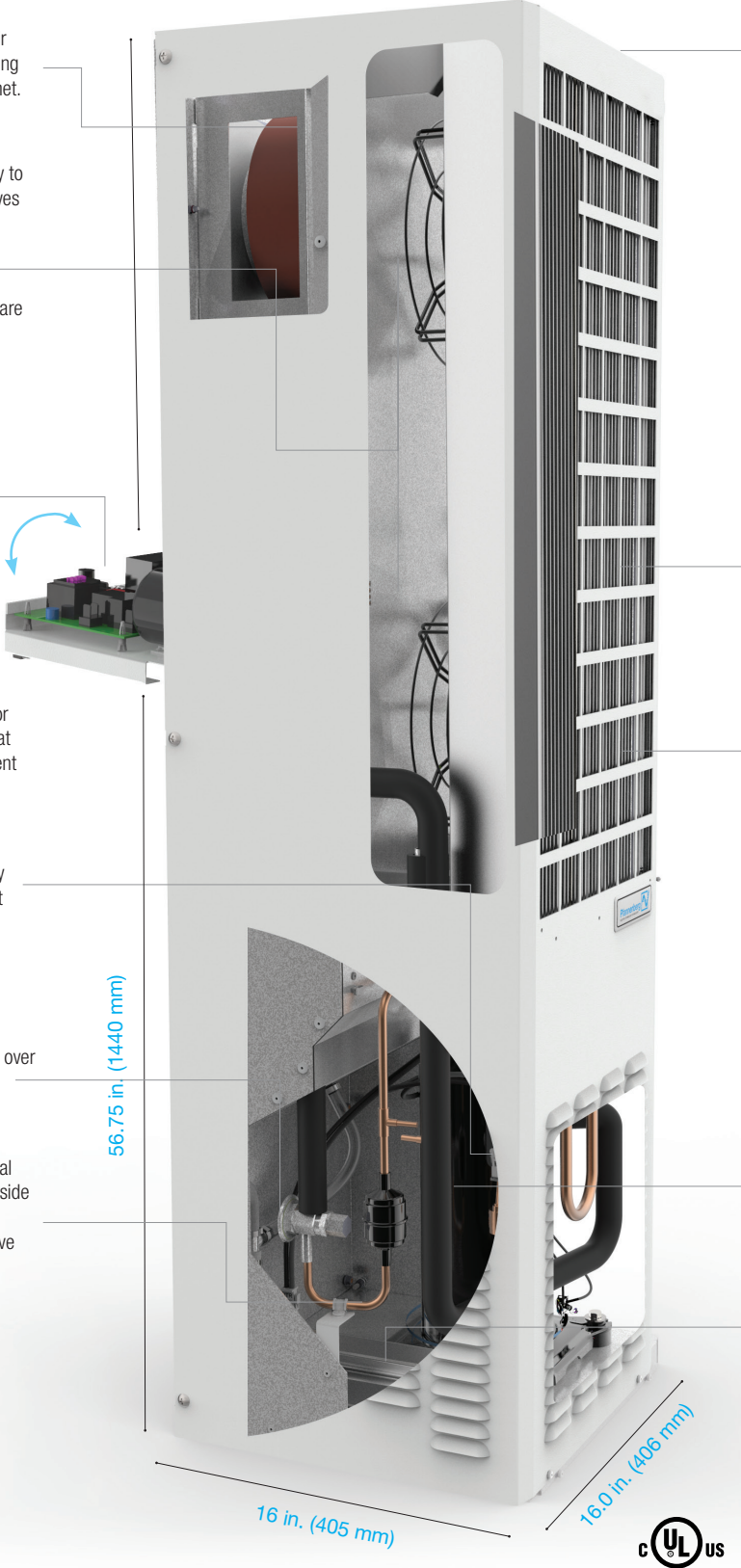
Ultra Efficient Design
Our micro-channel design provides greater efficiency. With up to 40% increased heat rejection vs. standard condensers, improving the transfer of heat from the refrigerant into the ambient air.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

ERP Efficiency Certified
As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements.

Hermetically Sealed Compressor
The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.

Active Condensate Management
Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.



DTS 34X1 Series (15000 - 20000 Btu/h) Side-Mount Cooling Units

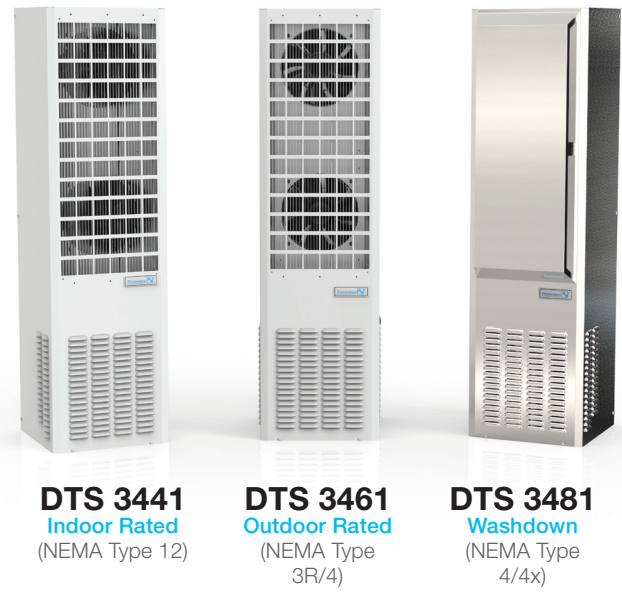
Table with 9 columns: Model Number, Part Number, Voltage (VAC), Frequency (Hz), Power Consumption (W), Nominal (Run) Current* @ 35A/35A °C, Fuse (maximum)** Class CC, Noise Level (according to EN ISO 3741) dB(A), Weight (without packaging) lb (kg). Rows include DTS 3441 Indoor Rated, DTS 3461 Outdoor Rated, and DTS 3481 Washdown.

Table with 5 columns: Additional Data, DTS 3441, DTS 3461, DTS 3481, and a unit column for °F / °C, g, and enclosure protection.

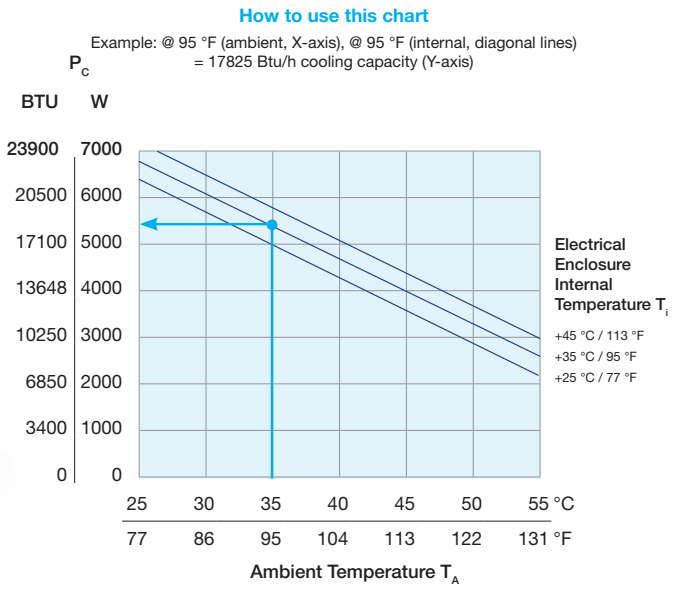
* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

For additional technical data, drawings and templates. www.pfannenbergusa.com

Available Models:



Cooling Capacity Performance Curve



DTS 36X1 | COOLING UNITS

20000 - 24000 Btu/h

The DTS 36X1 series cooling units have the largest capacity at almost 2 Tons. These units are ideally suited for high temperature, high ambient environments. Available in 3 models; **DTS 3641 (NEMA Type 12)** for indoor use, **DTS 3661 (NEMA Type 3R/4)** designed for outdoor use, and the stainless steel **DTS 3681 (NEMA Type 4/4x)** designed for washdown applications.

Closed Loop Design

Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

High Cooling Capacity

The largest capacity cooling unit for high heat load requirements. High cfm fan on evaporator side for generous air movement through the enclosure.

High Ambient Performance

The DTS 3000 Series Cooling Units were designed utilizing high temperature compressors and larger condensers. Both the indoor NEMA Type 12 units and outdoor units perform very well in environments that require cooling where the maximum ambient temperature is 131° F.

Pressure Overload Protection

High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Thermal Expansion Valve

Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Corrosion Protection

Outdoor and washdown units have a special coating on pipes and coils on the ambient side of the unit to provide maximum protection from saltwater, sour gas, and other corrosive substances.

Environmentally Friendly

Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.

Active Condensate Management

Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

High Airflow Backward Curve Impeller Fan

Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.

Lifting Lug Ports

Threaded holes accommodate the installation of lifting lugs to facilitate safe installation.

Self Protected from Harsh Environments

Our unit is uniquely designed to protect itself in NEMA 3R, 4, and 4X environments. An example of this is the location of our control electronics within our dry, cool interior circuit.

Thermal Overload Protection

Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature. This increases the operating life of the compressor by preventing thermal overload trips.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Maintenance Free, Filterless Design

The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.

ERP Efficiency Certified

As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements.

Hermetically Sealed Compressor

The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.

65.5 in. (1665 mm)

20.5 in. (520 mm)

19 in. (485 mm)



DTS 36X1 Series (20000 - 24000 Btu/h) Side-Mount Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current* @ 35A/35A °C	Fuse (maximum)** Class CC	Noise Level (according to EN ISO 3741) dBA	Weight (without packaging) lb (kg)
DTS 3641 Indoor Rated (NEMA Type 12)	13383939255	230	50/60	3142	17.1	30	<73	230 (105)
	13383936255	400/460	50/60	2275/2920	6.3	15	<73	230 (105)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251							
DTS 3661 Outdoor Rated (NEMA Type 3R/4)	13383939355	230	50/60	3142	17.1	30	<73	238 (108)
	13383936355	400/460	50/60	2275/2920	6.3	15	<73	238 (108)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...351							
DTS 3681 Washdown (NEMA Type 4/4x)	13383939158	230	50/60	3142	17.1	30	<73	240 (109)
	13383936158	400/460	50/60	2275/2920	6.3	15	<73	240 (109)
Design	Housing: stainless steel 304 Cover: stainless steel 304							

Additional Data		DTS 3641	DTS 3661	DTS 3681	
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55	+ 32 ... + 131 / + 0 ... + 55		°F / °C
Control range (adjustable) SC		+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35			
Refrigerant	type	R134a			
	quantity	1300			g
Condensate management		integrated condensate management system with condensate drain			
Protection system according to NEMA Type		12	3R/4	4/4X	against enclosure when properly installed
		NEMA 1 towards the surroundings when properly installed			
Accessories		For spare part kits and additional accessories visit pgs. 74-75 in this catalog			

* For the MCA (Maximum Current Ampacity) value per UL, please consult product technical datasheets available on our website
** SCCR rating - See user manual for instructions to achieve 50 kA (230V) or 200 kA (460V) SCCR Rating

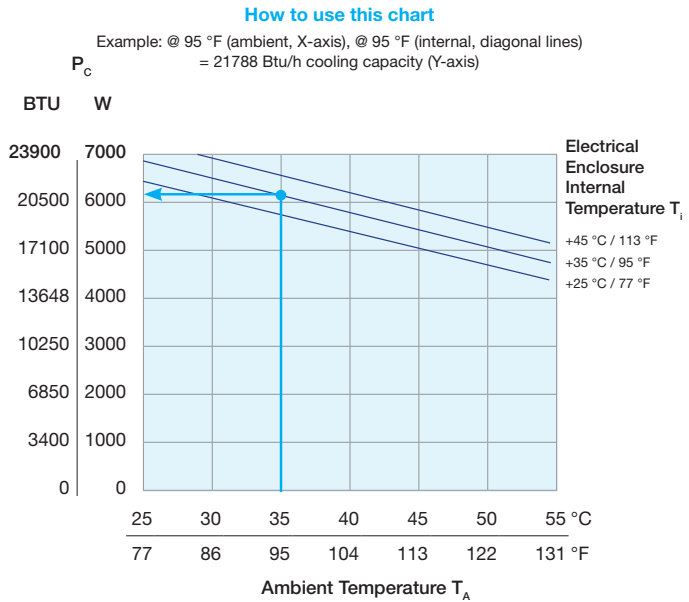
For additional technical data, drawings and templates. www.pfannenbergsusa.com

Available Models:



DTS 3641 Indoor Rated (NEMA Type 12)
DTS 3661 Outdoor Rated (NEMA Type 3R/4)
DTS 3681 Washdown (NEMA Type 4/4x)

Cooling Capacity Performance Curve



OEMs know: Looking towards the future, engineering processes will demand new and better uses of technology. Optimization is needed – with solutions that combine maximum performance, environmental friendliness and maximum cost efficiency. Our ECOOL technology sets this new standard.



ECOOL is the most efficient solution.

Raising productivity, reducing CO2 emissions and cutting costs – Pfannenberg is aware of the challenges companies are facing today. We offer a solution: ECOOL technology. Developed with the aim of maximum cost efficiency coupled with maximum performance, ECOOL technology represents a new standard for cost and energy savings in the thermal management of electrical enclosures. The result: **it enables annual savings of over 35 % in energy costs alone.**

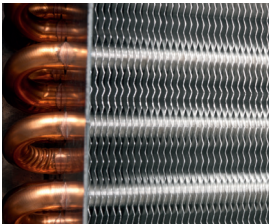
Produced out of rugged sheet metal, Pfannenberg’s cooling units are extremely resilient and long-lasting in test industrial operating conditions. Depending on requirements, they are available for traditional mounting on the door or side, for partially recessed door or side mounting and the space-saving top-mounted position. Colors can easily be integrated as well because the covers can be painted or powder coated to suit the particular industrial design.

The ECOOL series also set records in terms of ease of assembly and maintenance – which leads to more cost benefits.

ECOOL Easy Handling: Service-friendly design reduces routine costs.

Thought-out solutions for installation and service: Pfannenberg’s ECOOL series takes excellent accessibility and simple maintenance into consideration.

- Large condenser fin spacing allow for longer maintenance periods, even without an additional Nano coating.
- One mounting cut-out for 5 different performances, 1,000–4,000 W.
- Mounting possible by 1 person in a few minutes.
- Simple accessibility to all the relevant components.
- Fast component replacement.
- Integration in established network possible.
- Versatile voltage supply of 380–460 V via built-in transformer.
- Integrated condensate evaporation system.



Large fin spacing



Simple installation



Condensate evaporate system



Time-saving.

Tool-free patented mounting design allows for quick and efficient assembly that considerably reduces installation costs.



Simple installation.

Pfannenberg offers cooling units with the world largest possible cut-out compatibility providing unit replacement with the least possible installation work. Intelligent mounting systems minimize work during unit installation and replacement.

Advantages of the ECOOL Cooling Unit Series.

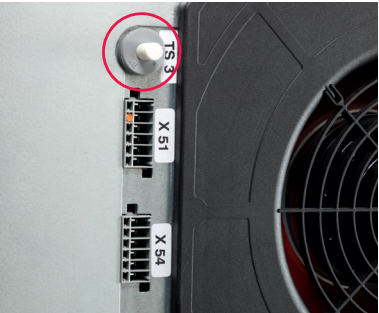


New Filter Adapter:

- Optional adapter for multiple use and all filter inserts.
- Optional filter inserts (aluminum, fleece or fluted filter inserts) depending on the environmental conditions/application.
- Patented fluted filter mats extend the service intervals by 300%.
- Tool-less installation and tool-less filter replacement.
- Filter replacement in less than one minute.
- Filter adapter available in several colors.

Controlled Energy Efficiency:

- Pfannenberg "Multi Controller" (MC) has now been upgraded with the energy savings mode (ESM) as a standard feature (DTI/DTS 6000 series).
- Internal fan switches off when no temperature increase is registered; condensate evaporator will then be deactivated.
- Cooling mode starts automatically upon exceeding the required cabinet temperature.
- Additional temperature probe for precise measurement of the internal cabinet temperature and to ensure correct operation of the energy savings mode.
- No intermediate start-up of the internal fan necessary for temperature monitoring of the cabinet.
- Fan’s length of life is significantly longer.



DTI 6000 C

RECESSED
COOLING UNITS

3000 - 6000 Btu/h

E^{COOL}

NEW

Partially Recessed

For space restricted installations, ideal for door mount.

High Airflow Backward Curve Impeller Fan

Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.

Thermal Overload Protection

Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature.

Pressure Overload Protection

High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.

Closed Loop Design

Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.

Thermal Expansion Valve

Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.

Efficient Circulation

Large distance between intake and exhaust vents for efficient air circulation and elimination of hot spots.

Environmentally Friendly

Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.


Energy Efficient Hibernation Mode


When cooling isn't necessary due to equipment shutdown or cold weather conditions, the unit conserves energy by turning fans off - except for periodic cycling for circulating air within the enclosure.

16.14 in. (410 mm)

37.87 in. (962 mm)

9.57 in. (243 mm)





The New DTI 6000C series compact cooling units are easily serviceable and easy to install. These units also feature the best energy efficiency in the market when compared against similar product. These cooling units are Ideal for mounting on a cabinet door and are partially recessed for space restricted installations.

Phase Protection

Three-phase 400/460 VAC powered units are protected from phase mis-wiring.

ERP Efficiency Certified

As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements for up to 43% energy savings and operating costs reduction.

Maintenance Free, Filterless Design

The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.

External Display

For visual temperature monitoring.

Easy Installation and Maintenance

Tool-free spring plate design keeps the unit safely in place and allows mounting by 1 person in less than 3 minutes with 55% lower mounting costs. Direct access to the PCB and the fans means 80% shorter repair times.

Hermetically Sealed Compressor

The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.


Active Condensate Management

Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

DTI 6000 C Series (3000 - 6000 Btu/h) Recessed Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current @ 35A/35A °C	Fuse (maximum) Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTI 6201C	13895221055	230	50/60	445 / 560	2.4 / 2.9	6	<62	88 (40)
	13895229055	400/460	50/60	480 / 570	1.8 / 2.1	10	<62	99 (45)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							
DTI 6301C	13895321055	230	60	705 / 820	5 / 5.2	6	<62	88 (40)
	13895329055	400/460	50/60	770 / 820	3.5 / 3.3	10	<62	99 (45)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							

Additional Data		DTI 6201C	DTI 6301C	
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55		°F / °C
Control range (adjustable)	SC	+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35		
Refrigerant	type	R134a		
	quantity	580		g
Condensate management		integrated condensate evaporation system with safety overflow		
Protection system according to EN 60529	IP54	towards the electrical enclosure if used as intended by the manufacturer		
	IP34	towards the surroundings if used as intended by the manufacturer		
Accessories		Consult Factory		



For additional technical data, drawings and templates.
www.pfannenbergusa.com

Available Models:



DTI 6201C
Indoor Rated

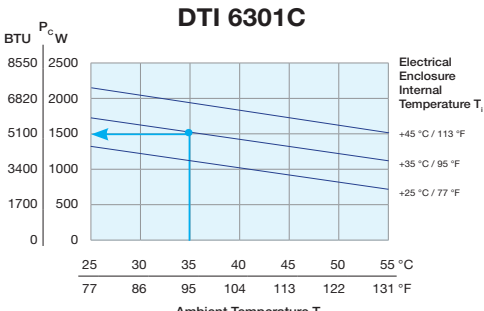
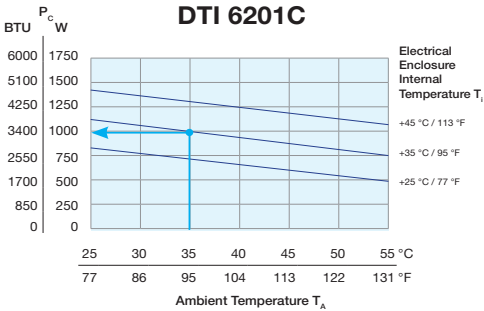


DTI 6301C
Indoor Rated

Cooling Capacity Performance Curves

How to use these charts

Example: @ 95 °F (ambient, X-axis),
@ 95 °F (internal, diagonal lines)
DTI 6201C = 3400 Btu/h cooling capacity (Y-axis)
DTI 6301C = 5100 Btu/h cooling capacity (Y-axis)



DTI 6201- 6301

RECESSED
COOLING UNITS

3000 - 6000 Btu/h

ECOOL

Partially Recessed
For space restricted installations,
ideal for door mount.

Easy Installation and Maintenance
Tool-free spring plate design keeps the
unit safely in place and allows mounting
by 1 person in less than 3 minutes
with 55% lower mounting costs. Direct
access to the PCB and the fans means
80% shorter repair times.

Thermal Overload Protection
Compressor and fan motors are
outfitted with integral temperature
switches to shut down the unit in the
event of excessive temperature.

Pressure Overload Protection
High pressure cutout switch ensures
safety by shutting off the compressor
in the event of excessive pressure
appearing in the refrigeration circuit.

Closed Loop Design
Designed to isolate the external ambient
air from the internally conditioned air
eliminating the risk of contaminants
entering the cabinet.

Thermal Expansion Valve
Regulates the flow of refrigerant
based on thermal demand for
efficient performance over the entire
operating temperature range.

Efficient Circulation
Large distance between intake and
exhaust vents for efficient air circulation
and elimination of hot spots.

Environmentally Friendly
Utilizes HFC-free R134a refrigerant
versus a blended refrigerant for eas-
ier service and minimized negative
impact to the environment.

Energy Efficient Hibernation Mode
When cooling isn't necessary due to
equipment shutdown or cold weather
conditions, the unit conserves energy by
turning fans off - except for periodic cycling
for circulating air within the enclosure.

The DTI 6201 - 6301 series cooling units
utilize a long internal air path to capture heat
above the components and provide cool
air below. These cooling units are Ideal for
mounting on a cabinet door and are partially
recessed for space restricted installations.

Phase Protection
Three-phase 400/460 VAC
powered units are protected from
phase mis-wiring.

ERP Efficiency Certified
As a component of the Kyoto
Protocol to reduce carbon
monoxide emissions, the European
Energy Related Products (ERP)
Directive includes an efficiency
rating for fans. Pfannenberg
proudly utilizes components which
adhere to these requirements for
up to 43% energy savings and
operating costs reduction.

**Maintenance Free, Filterless
Design**
The wide fin spacing is less
susceptible to clogging from dirt
buildup which can cause the
unit to work harder and hamper
efficiency.

External Display
For visual temperature monitoring.

**High Airflow Backward Curve
Impeller Fan**
Provides high airflow in a long
lasting, single bearing design.
Outperforms typical two-bearing
blowers with nearly twice the
lifespan.

Hermetically Sealed Compressor
The absence of any refrigerant
fill valves eliminates leak paths.
Recharging is never needed.
100% cooling capacity efficiency is
ensured.

Active Condensate Management
Condensation is a natural by-
product of refrigeration. The heated
condensate collection pan boils this
off thereby eliminating the need for
drain tubes and buckets.
To conserve power, this heater
only activates when necessary.

DTI 6201 - 6301 Series (3000 - 6000 Btu/h) Recessed Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current @ 35A/35A °C	Fuse (maximum) Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTI 6201	13896221055	230	50/60	454 / 567	3.08 / 3.65	16	<62	112 (51)
	13896229055	400/460	50/60	490 / 570	2.33 / 2.54	4	<62	128 (58)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							
DTI 6301	13896321055	230	60	727 / 868	5.08 / 5.17	16	<62	119 (54)
	13896329055	400/460	50/60	786 / 863	3.65 / 3.35	4	<62	132 (60)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							

Additional Data		DTI 6201	DTI 6301	
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55		°F / °C
Control range (adjustable)	SC	+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35		
Refrigerant	type	R134a		
	quantity	600		g
Condensate management		integrated condensate evaporation system with safety overflow		
Protection system according to EN 60529	IP54	towards the electrical enclosure if used as intended by the manufacturer		
	IP34	towards the surroundings if used as intended by the manufacturer		
Accessories		Consult Factory		



For additional technical data,
drawings and templates.
www.pfannenbergusa.com

Available Models:



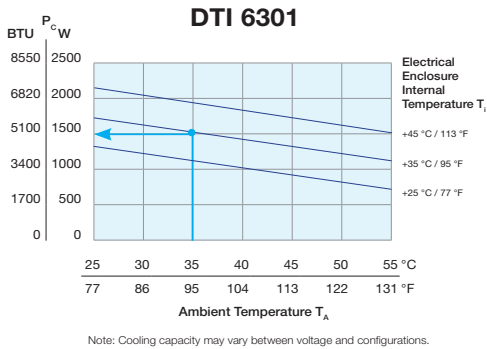
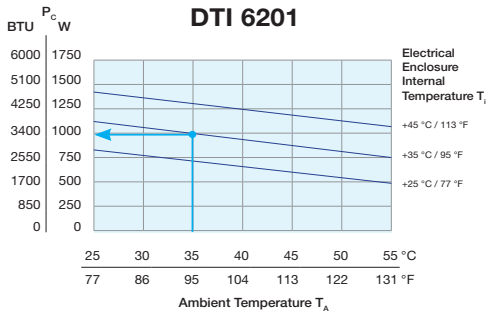
DTI 6201
Indoor Rated

DTI 6301
Indoor Rated

Cooling Capacity
Performance Curves

How to use these charts

Example: @ 95 °F (ambient, X-axis),
@ 95 °F (internal, diagonal lines)
DTI 6201 = 3400 Btu/h cooling
capacity (Y-axis)
DTI 6301 = 5100 Btu/h cooling
capacity (Y-axis)



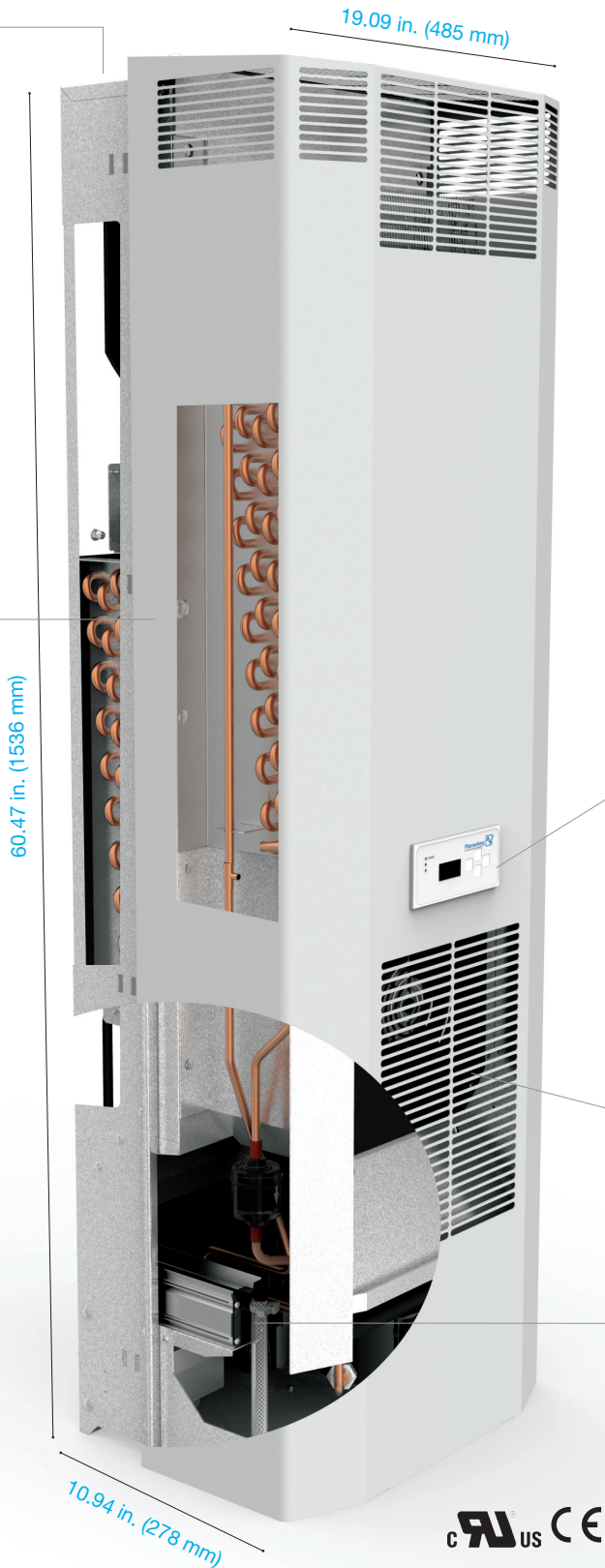
DTI 6401- 6501 | RECESSED COOLING UNITS

7000 - 11000 Btu/h

ECOOL

The DTI 6401 - 6501 series cooling units have about 2x greater cooling capacity than the DTI 6202/6301. These cooling units also utilize a long internal air path to capture heat above the components and provide cool air below. These units are Ideal for mounting on a cabinet door and are partially recessed for space restricted installations.

- Partially Recessed
- For space restricted installations, ideal for door mount.
- Easy Installation and Maintenance
- Tool-free spring plate design keeps the unit safely in place and allows mounting by 1 person in less than 3 minutes with 55% lower mounting costs. Direct access to the PCB and the fans means 80% shorter repair times.
- Thermal Overload Protection
- Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature.
- Pressure Overload Protection
- High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.
- Closed Loop Design
- Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.
- Thermal Expansion Valve
- Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.
- Efficient Circulation
- Large distance between intake and exhaust vents for efficient air circulation and elimination of hot spots.
- Environmentally Friendly
- Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.
- Energy Efficient Hibernation Mode
- When cooling isn't necessary due to equipment shutdown or cold weather conditions, the unit conserves energy by turning fans off - except for periodic cycling for circulating air within the enclosure.



- Phase Protection
- Three-phase 400/460 VAC powered units are protected from phase mis-wiring.
- ERP Efficiency Certified
- As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements for up to 43% energy savings and operating costs reduction.
- Maintenance Free, Filterless Design
- The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.
- External Display
- For visual temperature monitoring.
- High Airflow Backward Curve Impeller Fan
- Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.
- Hermetically Sealed Compressor
- The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.
- Active Condensate Management
- Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

DTI 6401 - 6501 Series (7000 - 11000 Btu/h) Recessed Cooling Units

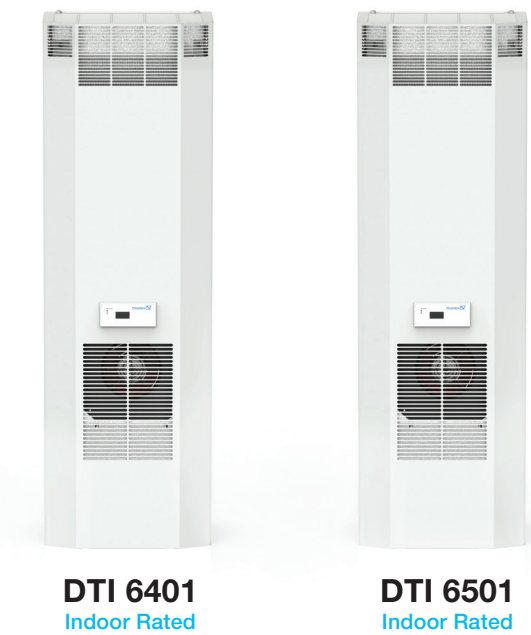
Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current @ 35A/35A °C	Fuse (maximum) Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTI 6401	13896422055	400/460	50/60	735 / 908	2.8 / 2.6	16	<65	139 (63)

Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							
DTI 6501	13896522055	400/460	50/60	1048 / 1247	3.3 / 3	16	<65	148 (67)

Additional Data	DTI 6401	DTI 6501	
Ambient Temperature Range	+ 59 ... + 131 / + 15 ... + 55		°F / °C
Control range (adjustable)	SC	+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35	
Refrigerant	type	R134a	
	quantity	1400	g
Condensate management	integrated condensate evaporation system with safety overflow		
Protection system according to EN 60529	IP54	towards the electrical enclosure if used as intended by the manufacturer	
	IP34	towards the surroundings if used as intended by the manufacturer	
Accessories	Consult Factory		

For additional technical data, drawings and templates. www.pfannenbergusa.com

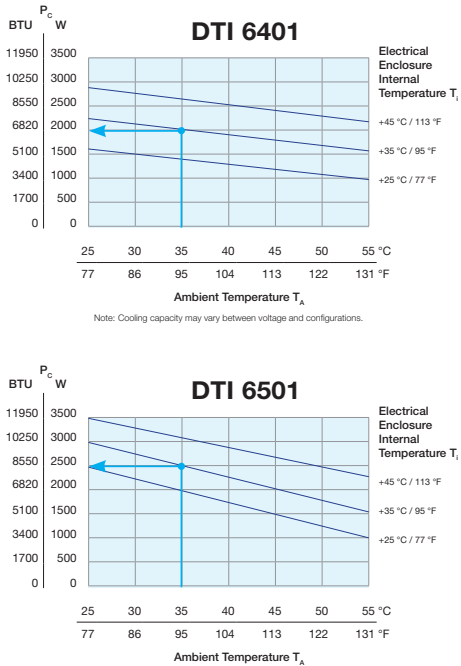
Available Models:



Cooling Capacity Performance Curves

How to use these charts

Example: @ 95 °F (ambient, X-axis), @ 95 °F (internal, diagonal lines)
DTI 6401 = 6820 Btu/h cooling capacity (Y-axis)
DTI 6501 = 8550 Btu/h cooling capacity (Y-axis)



DTI 6801

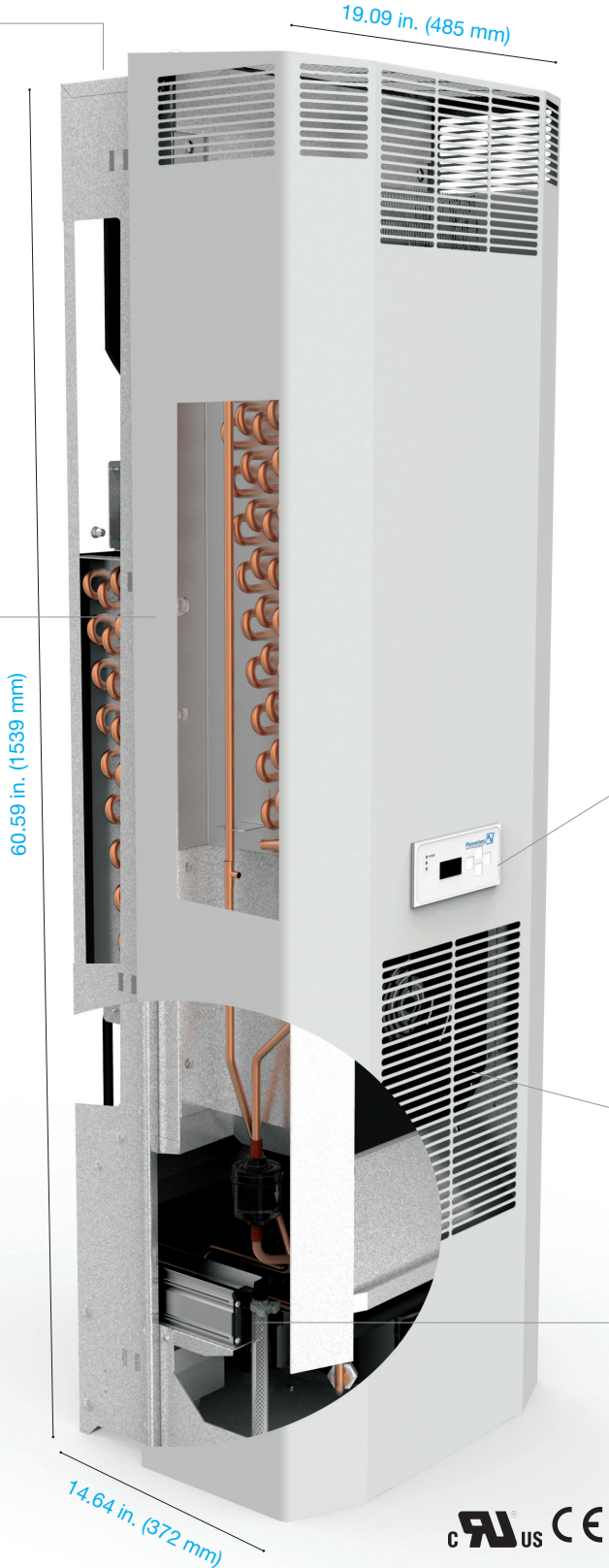
RECESSED
COOLING UNITS

13000 - 16000 Btu/h

ECOOL

The DTI 6801 series cooling units offer the greatest cooling capacity of our DTI Series Recessed Cooling Units. These cooling units also utilize a long internal air path to capture heat above the components and provide cool air below. These units are Ideal for mounting on a cabinet door and are partially recessed for space restricted installations.

- Partially Recessed**
For space restricted installations, ideal for door mount.
- Easy Installation and Maintenance**
Tool-free spring plate design keeps the unit safely in place and allows mounting by 1 person in less than 3 minutes with 55% lower mounting costs. Direct access to the PCB and the fans means 80% shorter repair times.
- Thermal Overload Protection**
Compressor and fan motors are outfitted with integral temperature switches to shut down the unit in the event of excessive temperature.
- Pressure Overload Protection**
High pressure cutout switch ensures safety by shutting off the compressor in the event of excessive pressure appearing in the refrigeration circuit.
- Closed Loop Design**
Designed to isolate the external ambient air from the internally conditioned air eliminating the risk of contaminants entering the cabinet.
- Thermal Expansion Valve**
Regulates the flow of refrigerant based on thermal demand for efficient performance over the entire operating temperature range.
- Efficient Circulation**
Large distance between intake and exhaust vents for efficient air circulation and elimination of hot spots.
- Environmentally Friendly**
Utilizes HFC-free R134a refrigerant versus a blended refrigerant for easier service and minimized negative impact to the environment.
- Energy Efficient Hibernation Mode**
When cooling isn't necessary due to equipment shutdown or cold weather conditions, the unit conserves energy by turning fans off - except for periodic cycling for circulating air within the enclosure.



- Phase Protection**
Three-phase 400/460 VAC powered units are protected from phase mis-wiring.
- ERP Efficiency Certified**
As a component of the Kyoto Protocol to reduce carbon monoxide emissions, the European Energy Related Products (ERP) Directive includes an efficiency rating for fans. Pfannenberg proudly utilizes components which adhere to these requirements for up to 43% energy savings and operating costs reduction.
- Maintenance Free, Filterless Design**
The wide fin spacing is less susceptible to clogging from dirt buildup which can cause the unit to work harder and hamper efficiency.
- External Display**
For visual temperature monitoring.
- High Airflow Backward Curve Impeller Fan**
Provides high airflow in a long lasting, single bearing design. Outperforms typical two-bearing blowers with nearly twice the lifespan.
- Hermetically Sealed Compressor**
The absence of any refrigerant fill valves eliminates leak paths. Recharging is never needed. 100% cooling capacity efficiency is ensured.
- Active Condensate Management**
Condensation is a natural by-product of refrigeration. The heated condensate collection pan boils this off thereby eliminating the need for drain tubes and buckets. To conserve power, this heater only activates when necessary.

DTI 6801 (13000 - 16000 Btu/h) Recessed Cooling Units								
Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current @ 35A/35A °C	Fuse (maximum) Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTI 6801	13896822055	400/460	50 / 60	1918 / 2369	4.5 / 4.6	16	<70	202 (92)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							
Additional Data				DTI 6801				
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55						°F / °C
Control range (adjustable)		SC	+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35					
Refrigerant	type	R134a						
	quantity	2000						g
Condensate management		integrated condensate evaporation system with safety overflow						
Protection system according to EN 60529	IP54	towards the electrical enclosure if used as intended by the manufacturer						
	IP34	towards the surroundings if used as intended by the manufacturer						
Accessories		Consult Factory						

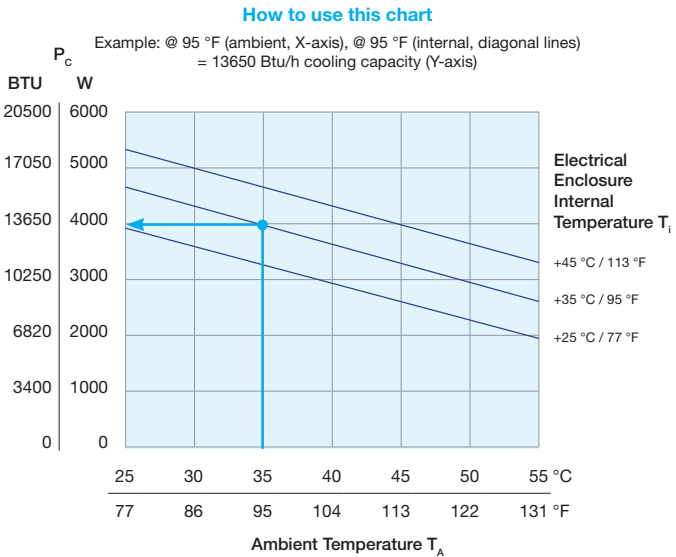
For additional technical data, drawings and templates.
www.pfannenbergusa.com

Available Models:



DTI 6801
Indoor Rated

Cooling Capacity Performance Curve



Note: Cooling capacity may vary between voltage and configurations.

THE DTT & COOL SERIES COOLING UNITS

For Top Mounted Applications

Pfannenberger's DTT Series top mounted cooling units are 100% condensate safe. These units are ideal for space-saving installation on the top of the control cabinet. One of the main features of the DTT's innovative condensate management design is the repositioning of the cooling circuits. Moving the cold area up prevents condensation from forming in the cabinet where the cooling unit meets the enclosure. A widened airflow in the evaporator stops the formation of condensate buildup. Finally return air channels are engineered to increase the speed of the air leaving the cooling unit, ensuring cool air is effectively distributed moisture-free within the enclosure.

Advantages of DTT Cooling Units:

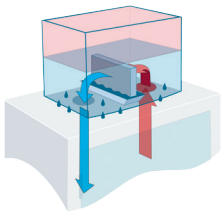
- Space-saving installation on top of the control cabinet:
 - Keep emergency exit routes and logistic paths clear.
 - Free up space on the production floor.
- Protected placement above the production floor. Unit is out of reach from fork lift trucks and other vehicles.
- DTT cooling units fit on all manufacturers' cabinets.
- 100 % protection against condensate due to patented seamless molded condensate tray.



DTT – Guaranteed 4-fold condensate protection:

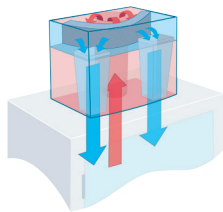
1. Repositioned cooling circuit prevents "cold bridge" formation on the ceiling of the electrical enclosure.
2. One piece leak-proof molded tub.
3. Managed water droplet control.
4. Eliminate the need for duct work inside the cabinet.

Cold Bridge



The challenge:

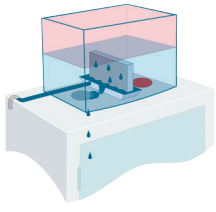
The lower, cold area of the cooling unit has direct contact with the ceiling of the warm electrical enclosure. As a result of this "cold bridge" effect, condensate can form on the inside ceiling of the electrical enclosure and drip into the inside.



The Pfannenberger solution:

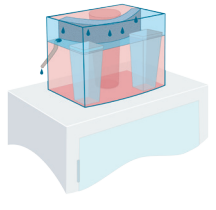
The position of the air-conditioning circuits was changed. When the cold area of the cooling unit is at the top and the warm area is at the bottom, a "cold bridge" cannot form on the inside ceiling eliminating the risk of condensate dripping inside the electrical enclosure.

Overflow of Condensate



The challenge:

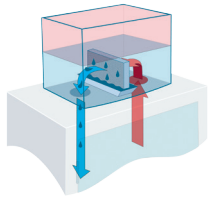
The horizontal condensate discharge which runs along the unit's floor makes the condensate drainage more difficult. Part of the condensate water that has accumulated in the cooling unit can overflow into the electrical enclosure via the air outlet opening.



The Pfannenberger solution:

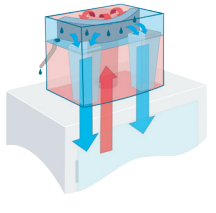
Vertical drainage of the condensate. The positioning of the evaporator in the top part of the cooling unit allows for problem-free drainage of the condensate water without contact to the electrical enclosure.

Condensate Build-up



The challenge:

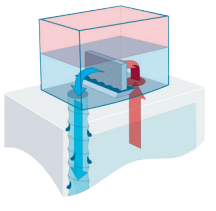
Concentrated warm air hits the evaporator. Parts of the condensate water formed there can be carried away by the airflow and can get into the electrical enclosure with the cold air.



The Pfannenberger solution:

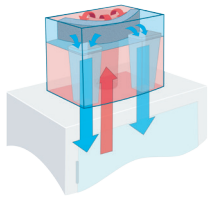
The warm air is spread out over a large evaporator. The reduced air speed at the evaporator reduces the risk of water being carried through the air, guaranteeing a condensate-free airflow in the direction of the electrical enclosure.

Air Hoses



The challenge:

The hoses conducting the cold air are surrounded by warm air from the electrical enclosure. As a result, condensate can form on the surface of the hose.



The Pfannenberger solution:

Integrated nozzles instead of air hoses. Air outlet nozzles are positioned on both sides of the cooling unit which accelerate the cold air and conduct it condensate-free down to the bottom of the electrical enclosure.

DTT 6101- 6201

1200 - 4000 Btu/h

COOLING
UNITS

ECOOL



Zero Sweat Guarantee

Condensate will not form in the cabinet where the cooling unit meets the enclosure.

Managed Water Droplet Control

As the airflow passes through the evaporator, any condensate generated on the evaporator will not be carried into the enclosure.

Eliminate the need for Duct Work

Return air channels are engineered to increase the speed of the air leaving the cooling unit, ensuring cool air is effectively distributed moisture-free within the enclosure.

One Piece Leak-Proof Molded Tub

Industry's only seamless molded condensate tray located at the top of the unit eliminates the ability for water to drip into the cabinet.

Energy Efficient

Our optional multi controller connected to a sensor, automatically turns off the fan when it is not needed.

Active Condensate Management

Condensate evaporator uses heat to eliminate condensate even when the system is not actively cooling.

Durable and Reliable Components

High quality compressor, fans and heat exchangers provide dependable cooling of electrical enclosure components. The micro-channel design provides a condenser coil that is harder to damage. Fin combing is not necessary to maintain proper airflow channels.

Ultra Efficient Design

Our micro-channel design provides greater efficiency. With up to 40% increased heat rejection vs. standard condensers, improving the transfer of heat from the refrigerant into the ambient air.

Fast and Easy Maintenance

Removable cover allows for easy access to the front facing control components. In addition the micro-channel condenser design allows for an air path that clogs less and is significantly easier to clean during general maintenance.

Reduced Maintenance Costs

Have a dirty environment? Use our optional tool-free quick release filter mat mounting frame and a standard Pfannenberg filter to extend the life of the unit and reduce maintenance costs.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

The DTI 6101 - 6201 cooling units use our 100% patented condensate safety design and new micro-channel condensers for greater efficiency. These cooling units are designed to be placed on top of the enclosure when there is a space shortage or aisles need to be kept clear.

DTT 6101 - 6201 Series (1200 - 4000 Btu/h) Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current @ 35A/35A °C	Fuse (maximum) Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTT 6101 Indoor Rated (NEMA Type 12)	13256144055	115	60	569	5.6	20	<62	73 (33)
	13256141055	230	50/60	458 / 532	2.36 / 3	10	<62	73 (33)

Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							
DTT 6201 Indoor Rated (NEMA Type 12)	13256244055	115	60	877	10	20	<62	77 (35)
	13256241055	230	50/60	663 / 805	3.98 / 4.5	10	<62	77 (35)
	13256249055	400/460	50/60	706 / 845	2.82 / 2.5	6	<62	90 (41)

Additional Data		DTT 6101	DTT 6201	
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55		°F / °C
Control range (adjustable)	SC	+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35		
Refrigerant	type	R134a		
	quantity	400		g
Condensate management		active condensate evaporation system with safety overflow		
Protection system according to EN 60529		NEMA 12 against enclosure when properly installed		
		NEMA 1 towards the surroundings when properly installed		



For additional technical data, drawings and templates.
www.pfannenbergusa.com

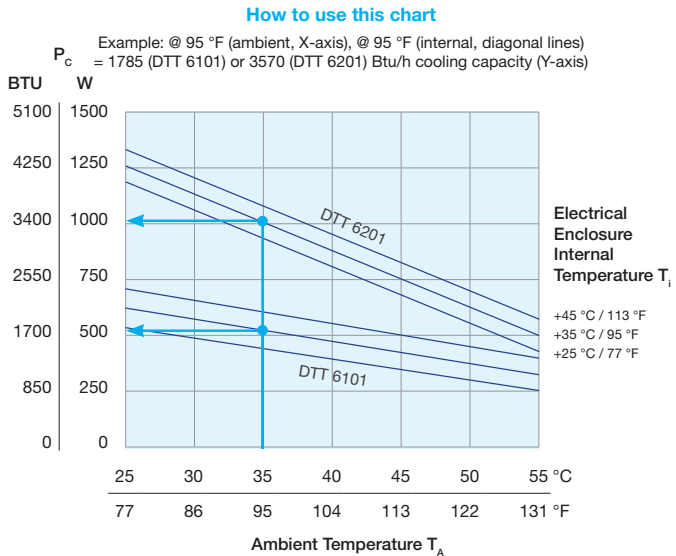
Available Models:



DTT 6101

DTT 6201

Cooling Capacity Performance Curve



DTT 6301- 6401

COOLING
UNITS

4000 - 7000 Btu/h

E^{COOL}



Zero Sweat Guarantee

Condensate will not form in the cabinet where the cooling unit meets the enclosure.

Managed Water Droplet Control

As the airflow passes through the evaporator, any condensate generated on the evaporator will not be carried into the enclosure.

Eliminate the need for Duct Work

Return air channels are engineered to increase the speed of the air leaving the cooling unit, ensuring cool air is effectively distributed moisture-free within the enclosure.

One Piece Leak-Proof Molded Tub

Industry's only seamless molded condensate tray located at the top of the unit eliminates the ability for water to drip into the cabinet.

Energy Efficient

Our optional multi controller connected to a sensor, automatically turns off the fan when it is not needed.

Active Condensate Management

Condensate evaporator uses heat to eliminate condensate even when the system is not actively cooling.

Durable and Reliable Components

High quality compressor, fans and heat exchangers provide dependable cooling of electrical enclosure components. The micro-channel design provides a condenser coil that is harder to damage. Fin combing is not necessary to maintain proper airflow channels.

Ultra Efficient Design

Our micro-channel design provides greater efficiency. With up to 40% increased heat rejection vs. standard condensers, improving the transfer of heat from the refrigerant into the ambient air.

Fast and Easy Maintenance

Removable cover allows for easy access to the front facing control components. In addition the micro-channel condenser design allows for an air path that clogs less and is significantly easier to clean during general maintenance.

Reduced Maintenance Costs

Have a dirty environment? Use our optional tool-free quick release filter mat mounting frame and a standard Pfannenberg filter to extend the life of the unit and reduce maintenance costs.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

The DTT 6301 - 6401 cooling units use our 100% patented condensate safety design and new micro-channel condensers for greater efficiency. These cooling units are designed to be placed on top of the enclosure when there is a space shortage or aisles need to be kept clear.

DTT 6301 - 6401 Series (4000 - 7000 Btu/h) Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current @ 35A/35A °C	Fuse (maximum) Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTT 6301 Indoor Rated (NEMA Type 12)	13256344055	115	60	1027	15	20	<62	88 (40)
	13256341055	230	50/60	980 / 1140	5.73 / 7	10	<62	99 (45)
	13256349055	400/460	50/60	962 / 1150	3.75 / 3.6	6	<62	116.8 (53)

Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);							
DTT 6401 Indoor Rated (NEMA Type 12)	13256444055	115	60	1894	20	20	<62	97 (44)
	13256441055	230	50/60	1049 / 1275	6.2 / 7	10	<62	101 (46)
	13256432055	400/460	50/60	1300 / 1598	3.35 / 3.3	6	<62	112 (51)

Additional Data		DTT 6301		DTT 6401		
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55				°F / °C
Control range (adjustable) SC		+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35				
Refrigerant	type	R134a				
	quantity	725		650		g
Condensate management		integrated condensate evaporation system with safety overflow				
Protection system according to EN 60529		NEMA 12 against enclosure when properly installed				
		NEMA 1 towards the surroundings when properly installed				

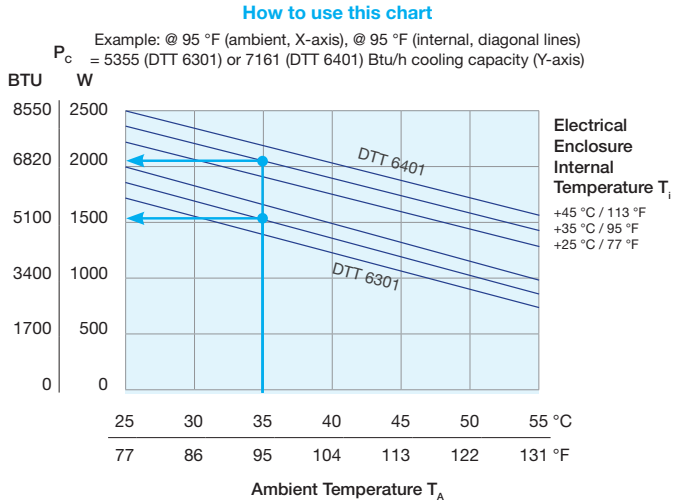
For additional technical data, drawings and templates. www.pfannenbergusa.com

Available Models:



DTT 6301 DTT 6401

Cooling Capacity Performance Curve



DTT 6601- 6801

7000 - 14000 Btu/h

COOLING
UNITS

ECOOL



Zero Sweat Guarantee

Condensate will not form in the cabinet where the cooling unit meets the enclosure.

Managed Water Droplet Control

As the airflow passes through the evaporator, any condensate generated on the evaporator will not be carried into the enclosure.

Eliminate the need for Duct Work

Return air channels are engineered to increase the speed of the air leaving the cooling unit, ensuring cool air is effectively distributed moisture-free within the enclosure.

One Piece Leak-Proof Molded Tub

Industry's only seamless molded condensate tray located at the top of the unit eliminates the ability for water to drip into the cabinet.

Energy Efficient

Our optional multi controller connected to a sensor, automatically turns off the fan when it is not needed.

Active Condensate Management

Condensate evaporator uses heat to eliminate condensate even when the system is not actively cooling.



Durable and Reliable Components

High quality compressor, fans and heat exchangers provide dependable cooling of electrical enclosure components. The micro-channel design provides a condenser coil that is harder to damage. Fin combing is not necessary to maintain proper airflow channels.

Ultra Efficient Design

Our micro-channel design provides greater efficiency. With up to 40% increased heat rejection vs. standard condensers, improving the transfer of heat from the refrigerant into the ambient air.

Fast and Easy Maintenance

Removable cover allows for easy access to the front facing control components. In addition the micro-channel condenser design allows for an air path that clogs less and is significantly easier to clean during general maintenance.

Reduced Maintenance Costs

Have a dirty environment? Use our optional tool-free quick release filter mat mounting frame and a standard Pfannenberg filter to extend the life of the unit and reduce maintenance costs.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

The DTT 6601 - 6801 cooling units use our 100% patented condensate safety design and new micro-channel condensers for greater efficiency. These cooling units are designed to be placed on top of the enclosure when there is a space shortage or aisles need to be kept clear.

DTT 6601 - 6801 Series (7000 - 14000 Btu/h) Cooling Units

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current @ 35A/35A °C	Fuse (maximum) Class CC	Noise Level (according to EN ISO 3741) dB(A)	Weight (without packaging) lb (kg)
DTT 6601 Indoor Rated (NEMA Type 12)	13256632055	400/460	50/60	1700 / 2100	3.16 / 4.5	10	<62	165 (75)

Design Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);

DTT 6801 Indoor Rated (NEMA Type 12)	13256832055	400/460	50/60	1601 / 1989	4.6 / 4.5	10	<62	170 (77)
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Design Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey);

Additional Data		DTT 6601	DTT 6801	
Ambient Temperature Range		+ 59 ... + 131 / + 15 ... + 55		°F / °C
Control range (adjustable)	SC	+ 77 ... + 113 / + 25 ... + 45; factory setting + 95 / + 35		
Refrigerant	type	R134a		g
	quantity	1250		
Condensate management		integrated condensate evaporation system with safety overflow		
Protection system according to EN 60529		NEMA 12 against enclosure when properly installed		
		NEMA 1 towards the surroundings when properly installed		



For additional technical data, drawings and templates.
www.pfannenbergusa.com

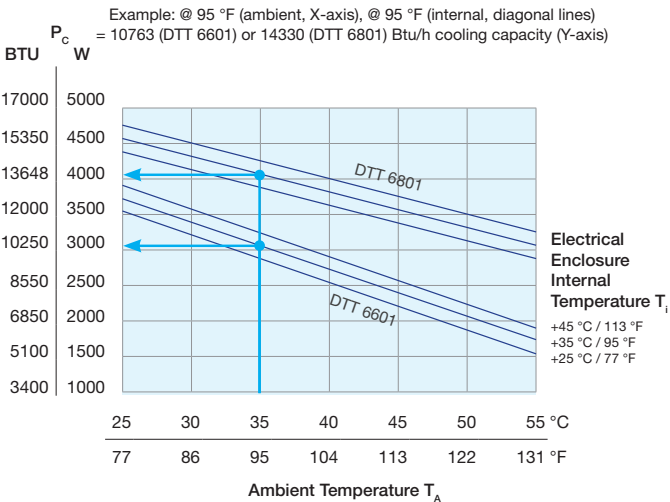
Available Models:



DTT 6601 DTT 6801

Cooling Capacity Performance Curve

How to use this chart



Note: Cooling capacity may vary between voltage and configurations.



Original Parts - Only from Pfannenberger

Why choose Pfannenberger's original parts:

A long service life and a fair price make our original parts particularly economical.

- They are the right parts.
- They fit.
- They are in stock.
- They can be delivered quickly.
- You don't lose any valuable time.
- The proper functionality is guaranteed.
- The guarantee for your whole unit remains intact.



Model Number	Voltage	Part number
Electric Kit - Includes Fans & Electronics Components.		
Electric Kit DTS 36x1	460 V	18886000000
	230 V	18886000001
Electric Kit DTS 34x1	460 V	18886000002
Electric Kit DTS 32x5	460 V	18886000003
	230 V	18886000004
	115 V	18886000005
Electric Kit DTS 32x1	460 V	18886000006
	230 V	18886000007
	115 V	18886000008
Electric Kit DTS 31x5	460 V	18886000009
	230 V	18886000010
	115 V	18886000011
Electric Kit DTS 31x1	460 V	18886000012
	230 V	18886000013
	115 V	18886000014
Electric Kit DTS 3061/3081	230 V	18886000015
	115 V	18886000016
Electric Kit DTS 3031	230 V	18886000017
	115 V	18886000018
Electric E-Box Kit		
Electric E-Box Kit DTS 31x1	-	18886000019
Electric E-Box Kit DTS 32x5	-	18886000020

Model Number	Voltage	Part number
Refrigeration Kit - Includes Compressor, Expansion Valve, Pressure Switch.		
Refrig. Kit DTS 36x1	460 V	18886100000
	230 V	18886100001
Refrig. Kit DTS 34x1	460 V	18886100002
Refrig. Kit DTS 32x5	460 V	18886100003
	230 V	18886100004
	115 V	18886100005
Refrig. Kit DTS 32x1	460 V	18886100006
	230 V	18886100007
	115 V	18886100008
Refrig. Kit DTS 31x5	460 V	18886100009
	230 V	18886100010
	115 V	18886100011
Refrig. Kit DTS 31x1	230 V	18886100012
	460 V	18886100013
	115 V	18886100014
Refrig. Kit DTS 3061/3081	230 V	18886100015
	115 V	18886100016

For harsh, dirty environments



To add more flexibility to your unit

Distribution of cold air inside the control cabinet

Model Number	Part number
PFP 100 4" panel fan 115 V	18103000000
PFP 100 4" panel fan 230 V	18103000001
PFP 200 6" panel fan 115 V	18103000002
PFP 200 6" panel fan 230 V	18103000003

(Not included with Panel Fan)

Model Number	Compatible with	Part number
PFP-BK 100	PFP 100	002006182
PFP-BK 200	PFP 200	002006183

1 comes with PFP Unit

Model Number	Compatible with	Part number
PFP-FG 100	PFP 100	005059200
PFP-FG 200	PFP 200	005059201

External container for collecting the accumulating condensed water.

Compatible with	Part number
All units	18314000100



External condensate evaporator for the accumulated condensed water.

Compatible with	Part number
115 - 230 V 50 / 60 Hz	18314000001



PWS 3000 Series Air / Water Heat Exchangers

Efficient Cooling when Ambient Conditions are at their Worst

The use of Pfannenberger Air/Water Heat Exchangers is particularly suitable where ambient temperatures are high or the atmosphere proves to be particularly oily or aggressive.

Ideal areas of use for air/water heat exchangers are wherever machines or production processes are cooled by tempered water and water is thus already provided.

With cooling capacities ranging from 2,218 BTU (650 W) to 34,121 BTU (10,000 W) these units are specifically engineered to allow safe, efficient use of liquid coolant to cool enclosure electronics. Additionally our sloped horizontal cover surfaces and optional NEMA Type 4X stainless steel type rating make the PWS 3000 series perfect for wash-down applications.



THE TECHNOLOGY OF COOLING

Cooling with Closed Loop Air to Water Heat Exchangers

Pfannenberg Air to Water Heat Exchangers use a supplied water source to remove the heat from the electrical cabinet. The heat from the enclosure is transferred to fluid and the heated fluid is then piped away adding no heat to the ambient environment. Because there is no heat transfer to the ambient environment, there is no need to de-rate the units performance in high ambient conditions.

How do I know if a Air to Water Heat Exchanger is the right product for my application?

- If there is a chilled water supply readily available at the enclosure.
- If the environment has extreme conditions like extremely high ambients, extremely dirty or caustic, that make other systems not applicable.

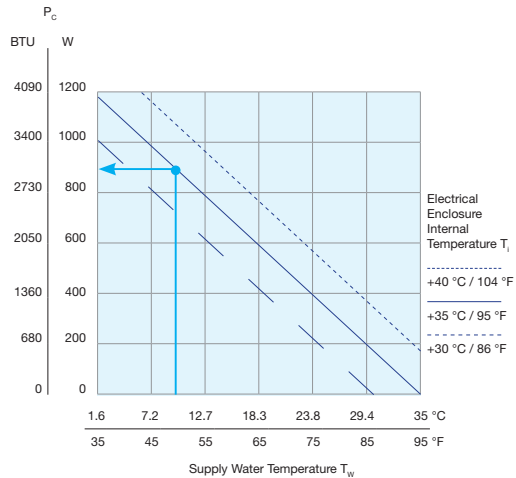
Properly sizing a Air to Water Heat Exchanger

To properly size an Air to Water Heat Exchanger you must know the **required cooling capacity in Watts, available water temperature and the dimensions of the unit and enclosure.**

$$\{P_C = P_D - P_R\} \quad \{P_R = C \times A \times \Delta T\}$$

- **P_C [Watt]:**
Refrigeration capacity of a cooling unit.
- **C [W/m²°C]:**
Coefficient of heat transmission.
- **P_D [Watt]:**
Dissipation loss: Thermal power generated inside a cabinet by the dissipation loss of components.
- **A [m²]:**
Surface area of electronics cabinet.
- **ΔT [°C]:**
Difference in temperature between the ambient air and the air inside the electronics cabinet.
- **P_R [Watt]:**
Radiant heat gain/loss: Heat transfer through the skin of the enclosure (insulation factor not included).

Utilizing performance curves to properly size cooling units:
Pfannenberg utilizes the DIN standard 35/35 °C when rating our cooling units. Many other companies use 50/50 °C, which provides a higher, non-usable value. Customers should use their own application temperatures to determine the proper cooling capacity of the system.



Important information when utilizing Air to Water Heart Exchangers:

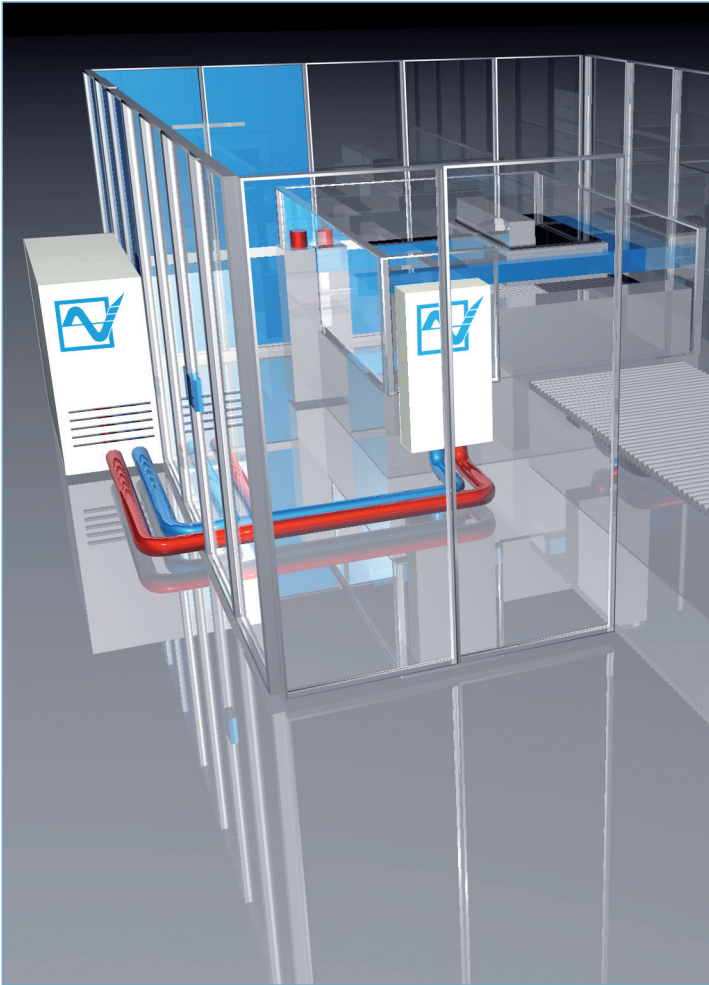
- The performance of an Air to water Heat Exchanger is directly related to the difference in the water temperature and the air temperature inside the enclosure.
- To manage condensation, an external condensation evaporator (KVDTX) can be used.
- The enclosure should be sealed to prevent the inflow of ambient air.
- Use the door contact switch to impede operation with open doors and consequent excessive accumulation of condensation.
- Make sure unit is level.
- Setting the temperature to the lowest setting is not the optimal solution due to the condensation issues. The value we have preset on the cooling unit is a sound compromise between cooling the inside of the enclosure and the accumulation of condensation.

AIR/WATER HEAT EXCHANGERS QUICK SELECTION CHART

Type	Cooling capacity Btu/h / W*	Rated voltage	Dimensions W x H x D Inches (mm)	Approvals			Page
				UL	cUL	CE	
PWS 3062	2218 / 650	115 V / 230 V	10.13 (257) x 24.14 (613) x 5.62 (142.8)	●	●	●	80
PWS 3082	2900 / 900	115 V / 230 V	10.13 (257) x 24.14 (613) x 5.62 (142.8)	●	●	●	80
PWS 3102	3753 / 1100	115 V / 230 V	15.80 (401) x 32.05 (814) x 6.28 (159)	●	●	●	82
PWS 3152	5800 / 1700	115 V / 230 V	11.78 (299) x 36.65 (931) x 8.11 (206)	●	●	●	84
PWS 3202	7165 / 2100	115 V / 230 V	15.76 (400) x 51.89 (1318) x 9.07 (230)	●	●	●	86
PWS 3302	12283 / 3600	115 V / 230 V	15.76 (400) x 51.89 (1318) x 9.07 (230)	●	●	●	88
PWS 3502	21496 / 6300	115 V / 230 V	15.76 (400) x 57.09 (1450) x 8.60 (218)	●	●	●	90
PWS 31002	34121 / 10000	230V / 460 V	19.74 (501) x 65.52 (1664) x 12.10 (307)	●	●	●	92
PWS 7102	3242 / 950	115 V / 230 V	7.87 (200) x 19.98 (500) x 5.91 (150)	●	●	●	94
PWS 7332	10748 / 3150	115 V / 230 V	15.75 (400) x 37.40 (950) x 7.48 (190)	●	●	●	94

The PWS 3000 Advantage Series has been engineered to provide enhanced performance features:

- Mounting templates that are compatible with those of the DTS 3000 cooling units provides interchangeability allowing the best Pfannenberg solution to be used for any application.
- Isolation of the water circuit components and enhanced air baffling provide the best protection of the control enclosure from water carry-over.
- An electronic thermostat with digital LED display allows easy performance verification and temperature programming.
- Free-draining heat exchanger coil design, plus manual operation of the water solenoid valve allows easy winterization for seasonal, outdoor applications.
- Sloped horizontal cover surfaces and optional NEMA Type 4X SS type rating make the PWS 3000 Advantage Series perfect for wash-down applications.



PWS 30X2 | AIR/WATER HEAT EXCHANGERS

2218 - 2900 Btu/h

The PWS 30X2 Advantage Series Air/Water Heat Exchangers is our smallest air/water heat exchanger. These units are ideal for harsh ambient conditions, requiring a cool liquid source and power. Available with either powder coated or stainless steel covers and 2 different capacities. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.



Washdown Roof Design
Metal covers are designed with a sloped top which sheds water away from the electrical enclosure as well as eliminates potential water pooling, corrosion and ice buildup.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Long Airflow Path
Heat exchangers are designed to draw hot air from the top of the enclosure and deliver cool air below the components.

Closed Loop Design
Designed to isolate the external ambient air from the internal air circuit eliminating the risk of contaminants entering the cabinet.

24.14 in. (513 mm)

10.13 in. (257 mm)

5.62 in. (142.8 mm)

Push to Connect Fittings
Hydronic connectors that supports quick connection to 1/2 inch O.D. hose or 1/2 inch I.D. hose with included adapter. Unlike other units that have rigid permanent connections.

Optimized Internal Design
Smart engineered solution, easy to service and maintain.

Intelligent Control of Water Flow
The adjustable electronic thermostat permits precise control of the electrical enclosure temperature by regulating the coolant flow by activating a solenoid valve. This regulates the coolant flow to minimize coolant waste and increase energy-efficiency.

Condensation Management
Physical barriers allow for condensation to be collected and drained from the system with zero intrusion into the cabinet.



PWS 3062 Series 2218 Btu/h (650 W) Air to Water Heat Exchangers

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 3062 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358010045	115	60	28.9	.33	6	1/2"push in fitting	<51	22 (10)
	12358020045	230	50/60	30.4	.15	6	1/2"push in fitting	<51	22 (10)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 3062 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358010048	115	60	28.9	.33	6	1/2"push in fitting	<51	22 (10)
	12358020048	230	50/60	30.4	.15	6	1/2"push in fitting	<51	22 (10)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

PWS 3082 Series 2900 Btu/h (900 W) Air to Water Heat Exchangers

PWS 3082 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358110045	115	60	21.3	0.235	6	1/2"push in fitting	<51	22 (10)
	12358120045	230	50/60	18.7	.126	6	1/2"push in fitting	<51	22 (10)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 3082 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358110048	115	60	21.3	0.235	6	1/2"push in fitting	<51	22 (10)
	12358120048	230	50/60	18.7	.126	6	1/2"push in fitting	<51	22 (10)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

Additional Data	PWS 3062	PWS 3062 SS	PWS 3082	PWS 3082 SS	
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 40; factory setting + 95 / + 35			°F / °C
Rated flow rate	2 (450)				gpm (L/H)
Maximum water pressure	145 (10)				PSIG (BAR)
NEMA Type rating	12/3R/4/4x				Against enclosure when properly installed



For additional technical data, drawings and manuals.
www.pfannenberguna.com

Available Models:

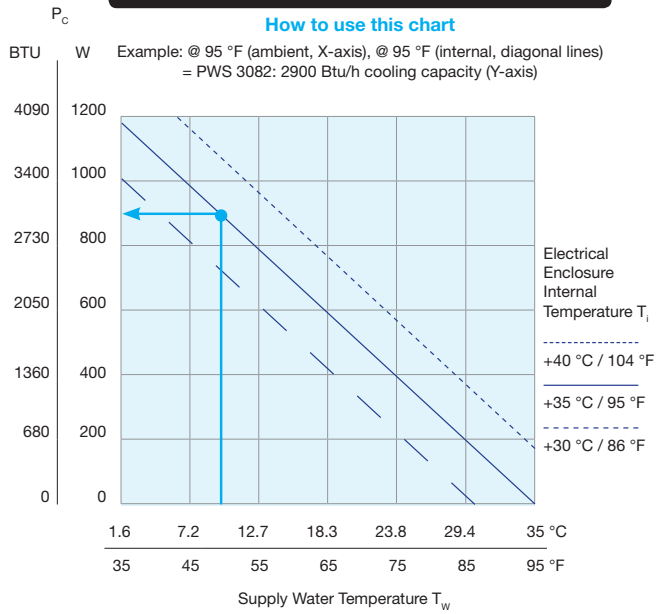


Light Grey
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)



Stainless Steel
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)

Cooling Capacity Performance Curve



Note: PWS 3062 Cooling Capacity chart can be find on www.pfannenberguna.com

PWS 3102

3753 Btu/h

AIR/WATER HEAT EXCHANGERS

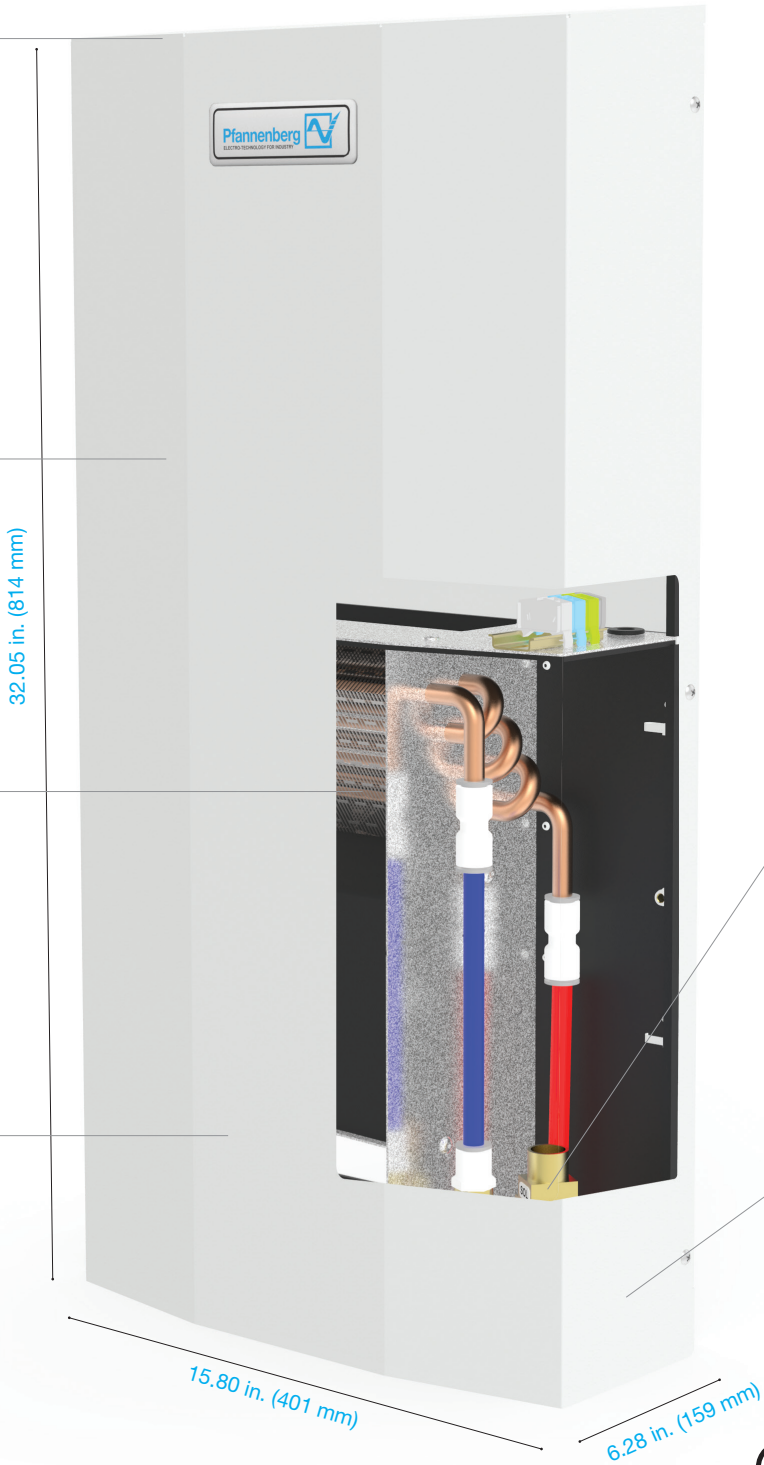
The PWS 3102 Advantage Series Air/Water Heat Exchangers offer over 3700 Btu/h cooling capacity and are ideal for harsh ambient conditions. Requiring only a cool liquid source and power. Available with either powder coated or stainless steel covers. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.

Washdown Roof Design
Metal covers are designed with a sloped top which sheds water away from the electrical enclosure as well as eliminates potential water pooling, corrosion and ice buildup.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Long Airflow Path
Heat exchangers are designed to draw hot air from the top of the enclosure and deliver cool air below the components.

Closed Loop Design
Designed to isolate the external ambient air from the internal air circuit eliminating the risk of contaminants entering the cabinet.



Push to Connect Fittings
Hydronic connectors that supports quick connection to 1/2 inch O.D. hose or 1/2 inch I.D. hose with included adapter. Unlike other units that have rigid permanent connections.

Optimized Internal Design
Smart engineered solution, easy to service and maintain.

Intelligent Control of Water Flow
The adjustable electronic thermostat permits precise control of the electrical enclosure temperature by regulating the coolant flow by activating a solenoid valve. This regulates the coolant flow to minimize coolant waste and increase energy-efficiency.

Condensation Management
Physical barriers allow for condensation to be collected and drained from the system with zero intrusion into the cabinet.



PWS 3102 Series 3753 Btu/h (1100 W) Air to Water Heat Exchangers

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 3102 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358210045	115	60	52.9	0.571	6	1/2"push in fitting	<59	33 (15)
	12358220045	230	50/60	58	0.29	6	1/2"push in fitting	<59	33 (15)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 3102 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358210048	115	60	52.9	0.571	6	1/2"push in fitting	<59	33 (15)
	12358220048	230	50/60	58	0.29	6	1/2"push in fitting	<59	33 (15)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

Additional Data		PWS 3102	PWS 3102 SS
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 45; factory setting + 95 / + 35	
Rated flow rate		2 (450)	
Maximum water pressure	PSIG	145 (10)	
NEMA Type rating		12/3R/4/4x	
			against enclosure when properly installed



For additional technical data, drawings and manuals.
www.pfannenbergusa.com

Available Models:



Light Grey
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)

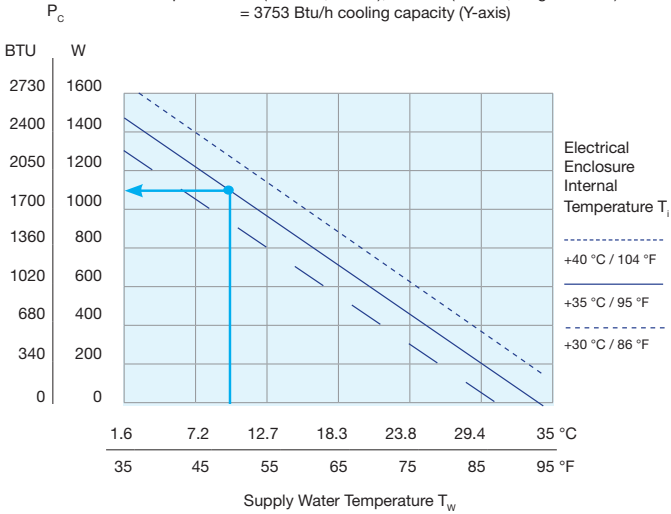


Stainless Steel
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)

Cooling Capacity Performance Curve

How to use this chart

Example: @ 95 °F (ambient, X-axis), @ 95 °F (internal, diagonal lines)
= 3753 Btu/h cooling capacity (Y-axis)



PWS 3152

AIR/WATER HEAT EXCHANGERS

5800 Btu/h

The PWS 3152 Advantage Series Air/Water Heat Exchangers offer over 5000 Btu/h cooling capacity and are ideal for harsh ambient conditions. Requiring only a cool liquid source and power. Available with either powder coated or stainless steel covers. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.



Washdown Roof Design
Metal covers are designed with a sloped top which sheds water away from the electrical enclosure as well as eliminates potential water pooling, corrosion and ice buildup.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Long Airflow Path
Heat exchangers are designed to draw hot air from the top of the enclosure and deliver cool air below the components.

Closed Loop Design
Designed to isolate the external ambient air from the internal air circuit eliminating the risk of contaminants entering the cabinet.

36.65 in. (931 mm)

11.78 in. (299 mm)

8.11 in. (206 mm)

Push to Connect Fittings
Hydronic connectors that supports quick connection to 1/2 inch O.D. hose or 1/2 inch I.D. hose with included adapter. Unlike other units that have rigid permanent connections.

Optimized Internal Design
Smart engineered solution, easy to service and maintain.

Intelligent Control of Water Flow
The adjustable electronic thermostat permits precise control of the electrical enclosure temperature by regulating the coolant flow by activating a solenoid valve. This regulates the coolant flow to minimize coolant waste and increase energy-efficiency.

Condensation Management
Physical barriers allow for condensation to be collected and drained from the system with zero intrusion into the cabinet.



PWS 3152 Series 5800 Btu/h (1700 W) Air to Water Heat Exchangers

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 3152 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358610005	115	60	55.7	0.56	6	1/2"push in fitting	<60	34 (15.5)
	12358620005	230	50/60	58	0.29	6	1/2"push in fitting	<60	34 (15.5)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 3152 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358610008	115	60	55.7	0.56	6	1/2"push in fitting	<60	34 (15.5)
	12358620008	230	50/60	58	0.29	6	1/2"push in fitting	<60	34 (15.5)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

Additional Data		PWS 3152	PWS 3152 SS	
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 45; factory setting + 95 / + 35		°F / °C
Rated flow rate		2 (450)		gpm (L/H)
Maximum water pressure	PSIG	145 (10)		PSIG (BAR)
NEMA Type rating		12/3R/4/4x		against enclosure when properly installed



For additional technical data, drawings and manuals.
www.pfannenberguna.com

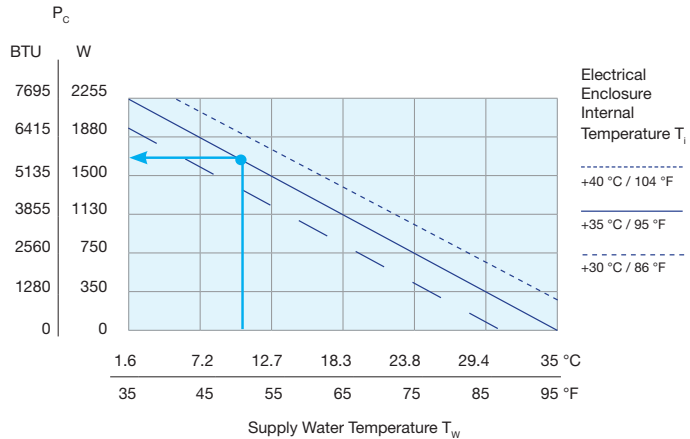
Available Models:

Light Grey
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)

Stainless Steel
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)

Cooling Capacity Performance Curve

How to use this chart
Example: @ 95 °F (ambient, X-axis), @ 95 °F (internal, diagonal lines)
= 5800 Btu/h cooling capacity (Y-axis)



PWS 3202 | AIR/WATER HEAT EXCHANGERS

7165 Btu/h

The PWS 3202 Advantage Series Air/Water Heat Exchangers offer over 7000 Btu/h cooling capacity and are ideal for harsh ambient conditions. Requiring only a cool liquid source and power. Available with either powder coated or stainless steel covers. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.



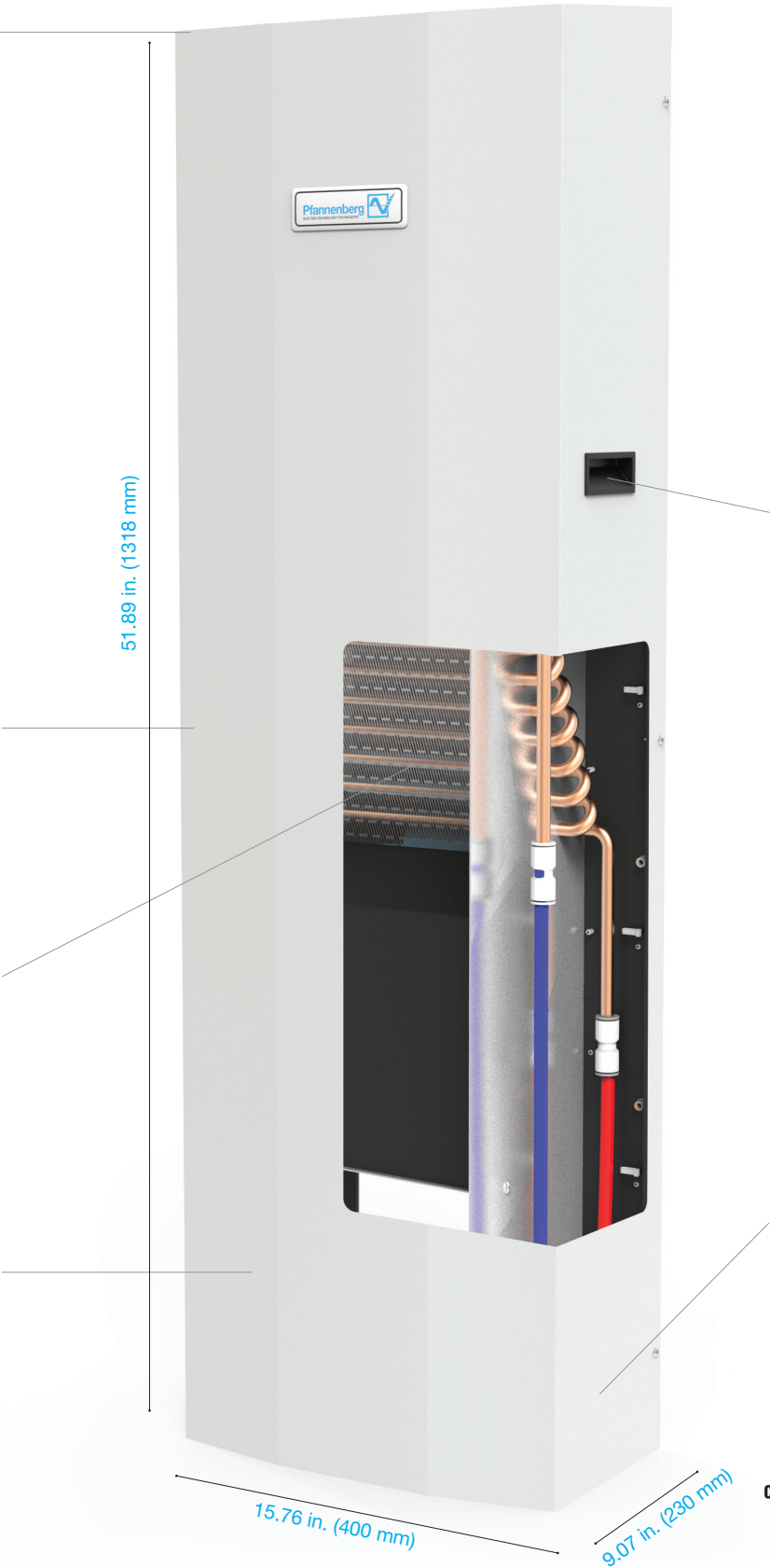
Washdown Roof Design
Metal covers are designed with a sloped top which sheds water away from the electrical enclosure as well as eliminates potential water pooling, corrosion and ice buildup.

Optimized Internal Design
Smart engineered solution, easy to service and maintain.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Long Airflow Path
Heat exchangers are designed to draw hot air from the top of the enclosure and deliver cool air below the components.

Closed Loop Design
Designed to isolate the external ambient air from the internal air circuit eliminating the risk of contaminants entering the cabinet.



Push to Connect Fittings
Hydronic connectors that supports quick connection to 1/2 inch O.D. hose or 1/2 inch I.D. hose with included adapter. Unlike other units that have rigid permanent connections.

Lifting Handles
Handles are mounted on the cover for easy handling and installation.

Intelligent Control of Water Flow
The adjustable electronic thermostat permits precise control of the electrical enclosure temperature by regulating the coolant flow by activating a solenoid valve. This regulates the coolant flow to minimize coolant waste and increase energy-efficiency.

Condensation Management
Physical barriers allow for condensation to be collected and drained from the system with zero intrusion into the cabinet.



PWS 3202 Series 7165 Btu/h (2100 W) Air to Water Heat Exchangers

Model Number	Part Number RAL 7035 (Light Grey)	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 3202 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358310045	115	60	77.6	0.694	6	1/2"push in fitting	<62	62 (28)
	12358320045	230	50/60	66.2	0.312	6	1/2"push in fitting	<62	62 (28)
Design	Housing: galvanized sheet steel Cover: galvanized/electrostatically powder coated (200 °C)								
PWS 3202 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358310048	115	60	77.6	0.694	6	1/2"push in fitting	<62	62 (28)
	12358320048	230	50/60	66.2	0.312	6	1/2"push in fitting	<62	62 (28)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

Additional Data		PWS 3202	PWS 3202 SS	
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 45; factory setting + 95 / + 35		°F / °C
Rated flow rate		2 (450)		gpm (L/H)
Maximum water pressure	PSIG	145 (10)		PSIG (BAR)
NEMA Type rating		12/3R/4/4x		against enclosure when properly installed

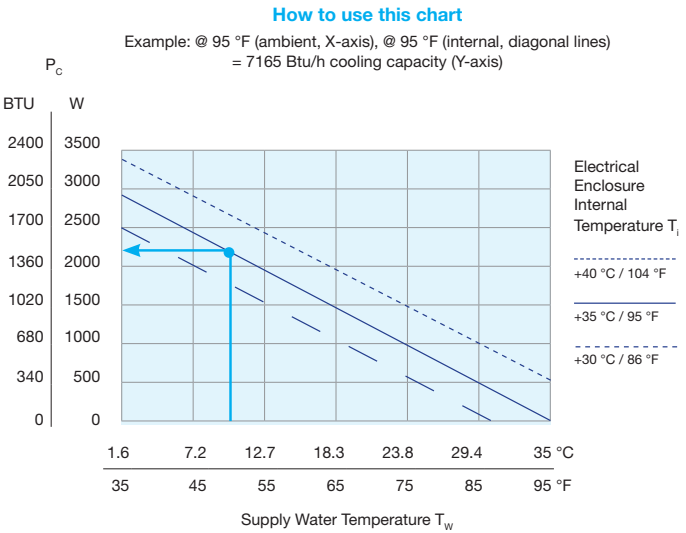


For additional technical data, drawings and manuals.
www.pfannenberguna.com

Available Models:



Cooling Capacity Performance Curve



PWS 3302

AIR/WATER HEAT EXCHANGERS

12283 Btu/h

The PWS 3302 Advantage Series Air/Water Heat Exchangers offer over 12000 Btu/h cooling capacity and are ideal for harsh ambient conditions. Requiring only a cool liquid source and power. Available with either powder coated or stainless steel covers. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.

Washdown Roof Design

Metal covers are designed with a sloped top which sheds water away from the electrical enclosure as well as eliminates potential water pooling, corrosion and ice buildup.

Optimized Internal Design

Smart engineered solution, easy to service and maintain.

Rugged Design

Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Long Airflow Path

Heat exchangers are designed to draw hot air from the top of the enclosure and deliver cool air below the components.

Closed Loop Design

Designed to isolate the external ambient air from the internal air circuit eliminating the risk of contaminants entering the cabinet.

Push to Connect Fittings

Hydronic connectors that supports quick connection to 1/2 inch O.D. hose or 1/2 inch I.D. hose with included adapter. Unlike other units that have rigid permanent connections.

Lifting Handles

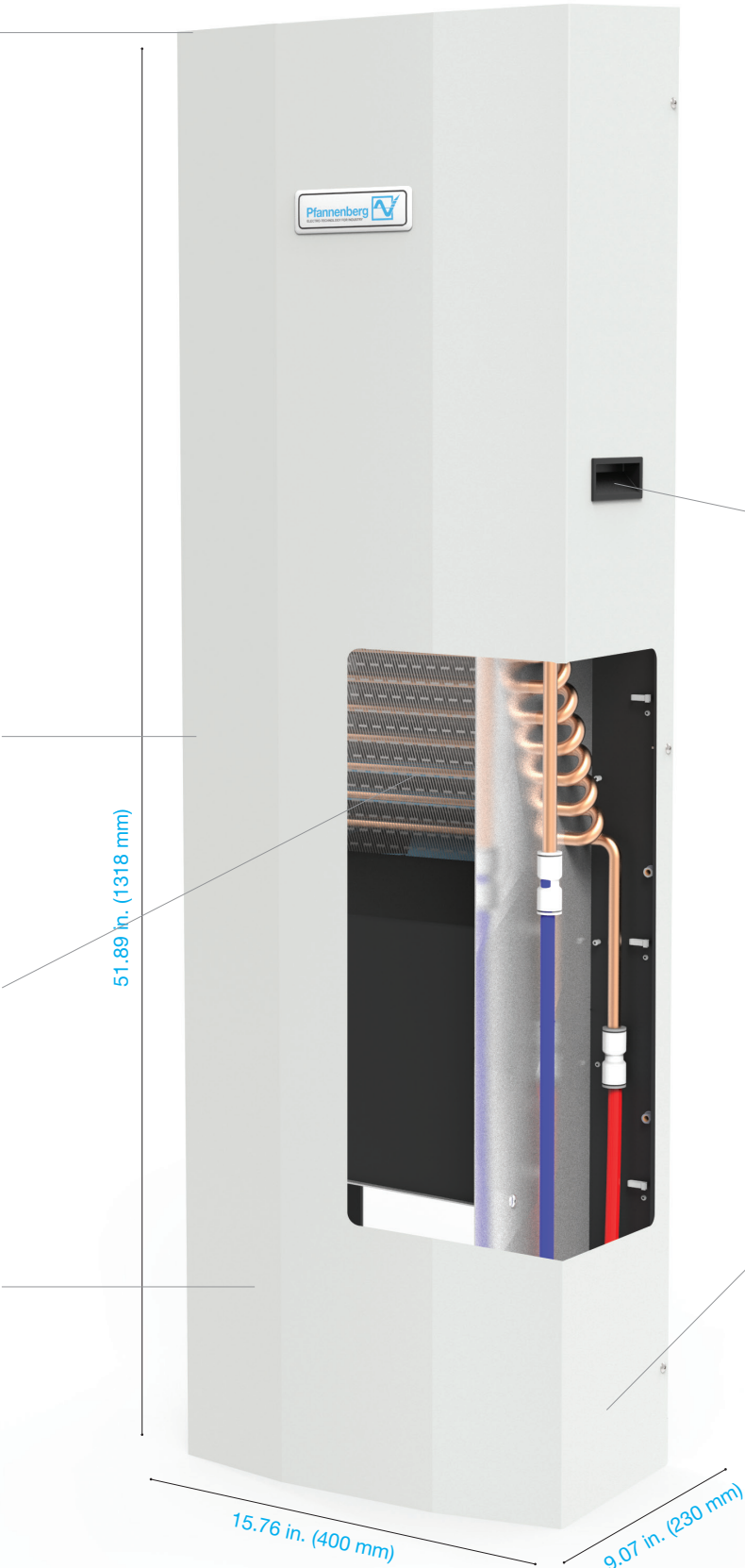
Handles are mounted on the cover for easy handling and installation.

Intelligent Control of Water Flow

The adjustable electronic thermostat permits precise control of the electrical enclosure temperature by regulating the coolant flow by activating a solenoid valve. This regulates the coolant flow to minimize coolant waste and increase energy-efficiency.

Condensation Management

Physical barriers allow for condensation to be collected and drained from the system with zero intrusion into the cabinet.



PWS 3302 Series 12283 Btu/h (3600 W) Air to Water Heat Exchangers

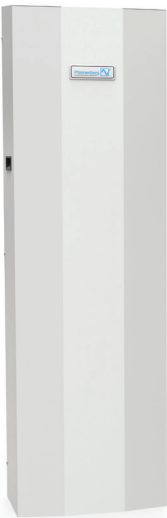
Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 3302 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358410045	115	60	77.9	0.698	6	1/2"push in fitting	<62	66 (30)
	12358420045	230	50/60	59	0.311	6	1/2"push in fitting	<62	66 (30)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 3302 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358410048	115	60	77.9	0.698	6	1/2"push in fitting	<62	66 (30)
	12358420048	230	50/60	59	0.311	6	1/2"push in fitting	<62	66 (30)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

Additional Data		PWS 3302	PWS 3302 SS	
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 45; factory setting + 95 / + 35		°F / °C
Rated flow rate		2 (450)		gpm (L/H)
Maximum water pressure	PSIG	145 (10)		PSIG (BAR)
NEMA Type rating		12/3R/4/4x		against enclosure when properly installed



For additional technical data, drawings and manuals.
www.pfannenbergusa.com

Available Models:



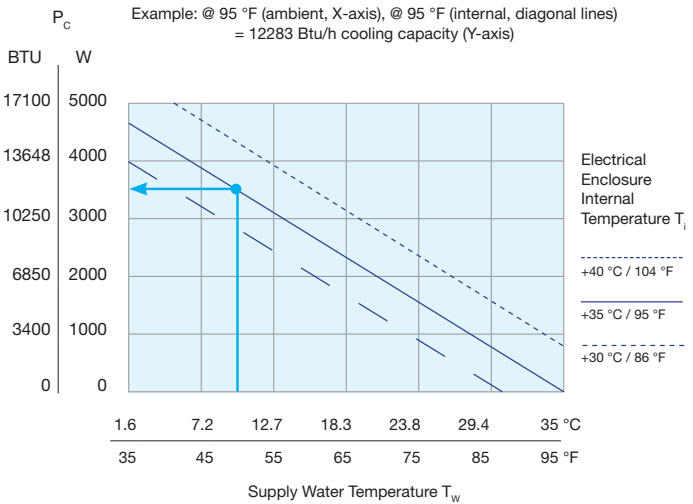
Light Grey
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)



Stainless Steel
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)

Cooling Capacity Performance Curve

How to use this chart



PWS 3502 | AIR/WATER HEAT EXCHANGERS

21496 Btu/h

The PWS 3502 Advantage Series Air/Water Heat Exchangers offer over 20000 Btu/h cooling capacity and are ideal for harsh ambient conditions. Requiring only a cool liquid source and power. Available with either powder coated or stainless steel covers. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.



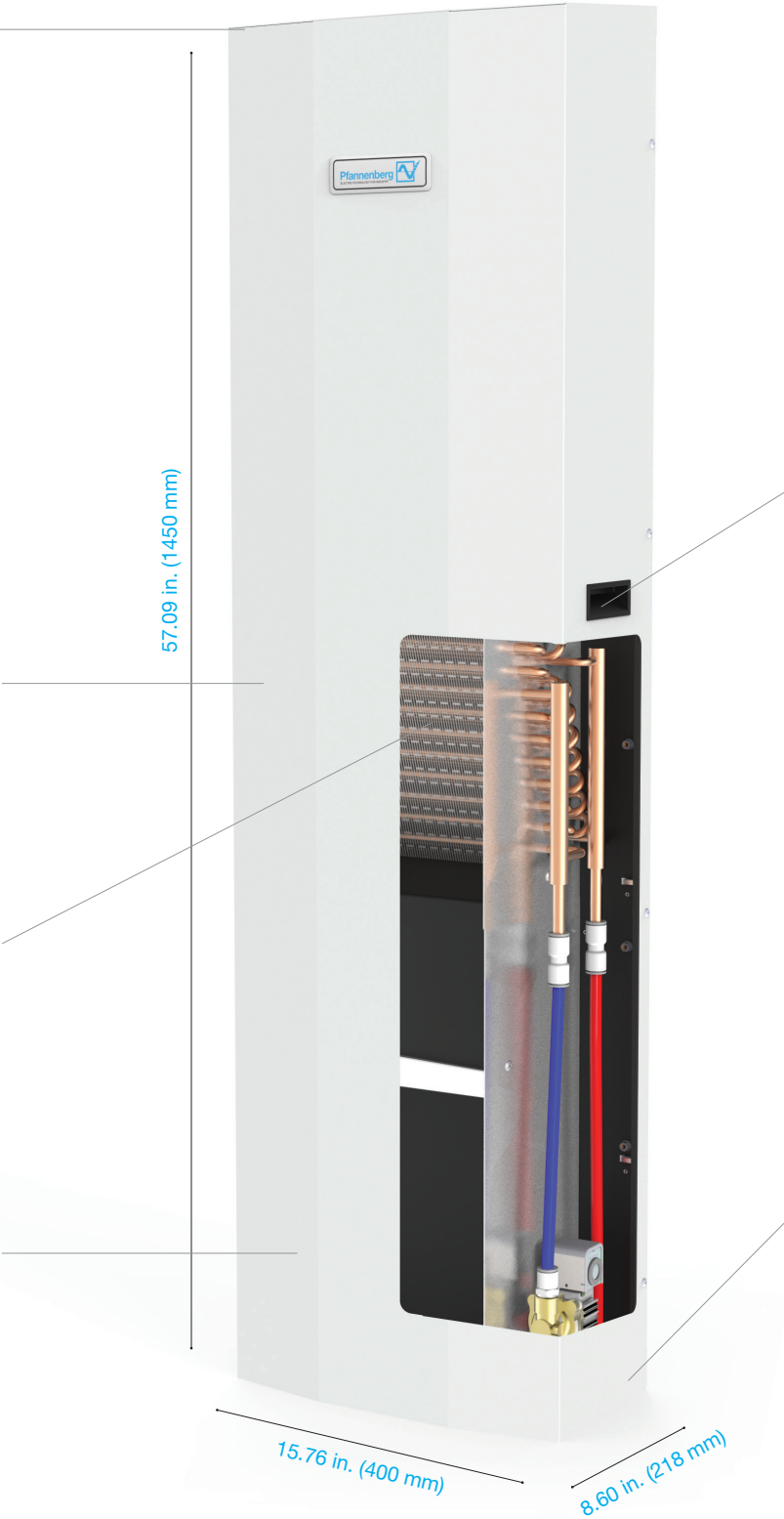
Washdown Roof Design
Metal covers are designed with a sloped top which sheds water away from the electrical enclosure as well as eliminates potential water pooling, corrosion and ice buildup.

Optimized Internal Design
Smart engineered solution, easy to service and maintain.

Rugged Design
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Long Airflow Path
Heat exchangers are designed to draw hot air from the top of the enclosure and deliver cool air below the components.

Closed Loop Design
Designed to isolate the external ambient air from the internal air circuit eliminating the risk of contaminants entering the cabinet.



Push to Connect Fittings
Hydronic connectors that supports quick connection to 1/2 inch O.D. hose or 1/2 inch I.D. hose with included adapter. Unlike other units that have rigid permanent connections.

Lifting Handles
Handles are mounted on the cover for easy handling and installation.

Intelligent Control of Water Flow
The adjustable electronic thermostat permits precise control of the electrical enclosure temperature by regulating the coolant flow by activating a solenoid valve. This regulates the coolant flow to minimize coolant waste and increase energy-efficiency.

Condensation Management
Physical barriers allow for condensation to be collected and drained from the system with zero intrusion into the cabinet.



PWS 3502 Series 21496 Btu/h (6300 W) Air to Water Heat Exchangers

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 3502 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358510045	115	60	215.6	1.89	6	1/2"push in fitting	<64	73 (33)
	12358520045	230	50/60	192.5	.982	6	1/2"push in fitting	<64	73 (33)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 3502 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358510048	115	60	215.6	1.89	6	1/2"push in fitting	<64	73 (33)
	12358520048	230	50/60	192.5	.982	6	1/2"push in fitting	<64	73 (33)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

Additional Data	PWS 3502	PWS 3502 SS
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 40; factory setting + 95 / + 35
Rated flow rate		2 (450)
Maximum water pressure	PSIG	145 (10)
NEMA Type rating		12/3R/4/4x



For additional technical data, drawings and manuals.
www.pfannenbergusa.com

Available Models:

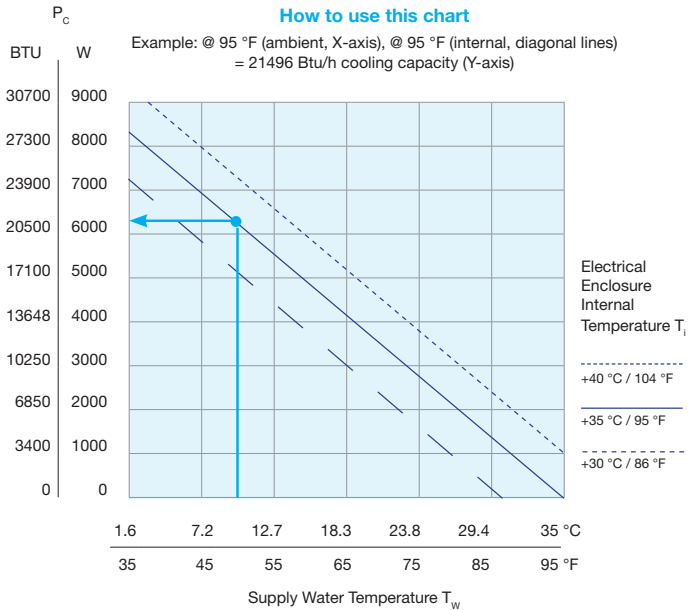


Light Grey
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)



Stainless Steel
Indoor/Outdoor Rated
(NEMA Type 12/3R/4/4x)

Cooling Capacity Performance Curve



PWS 31002 | AIR/WATER HEAT EXCHANGERS

34121 Btu/h

The PWS 31002 Advantage Series Air/Water Heat Exchangers are our largest units offering over 34000 Btu/h cooling capacity and are ideal for harsh ambient conditions. Requiring only a cool liquid source and power. Available with either powder coated or stainless steel covers. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.



Washdown Roof Design

Metal covers are designed with a sloped top which sheds water away from the electrical enclosure as well as eliminates potential water pooling, corrosion and ice buildup.

Optimized Internal Design

Smart engineered solution, easy to service and maintain.

Rugged Design

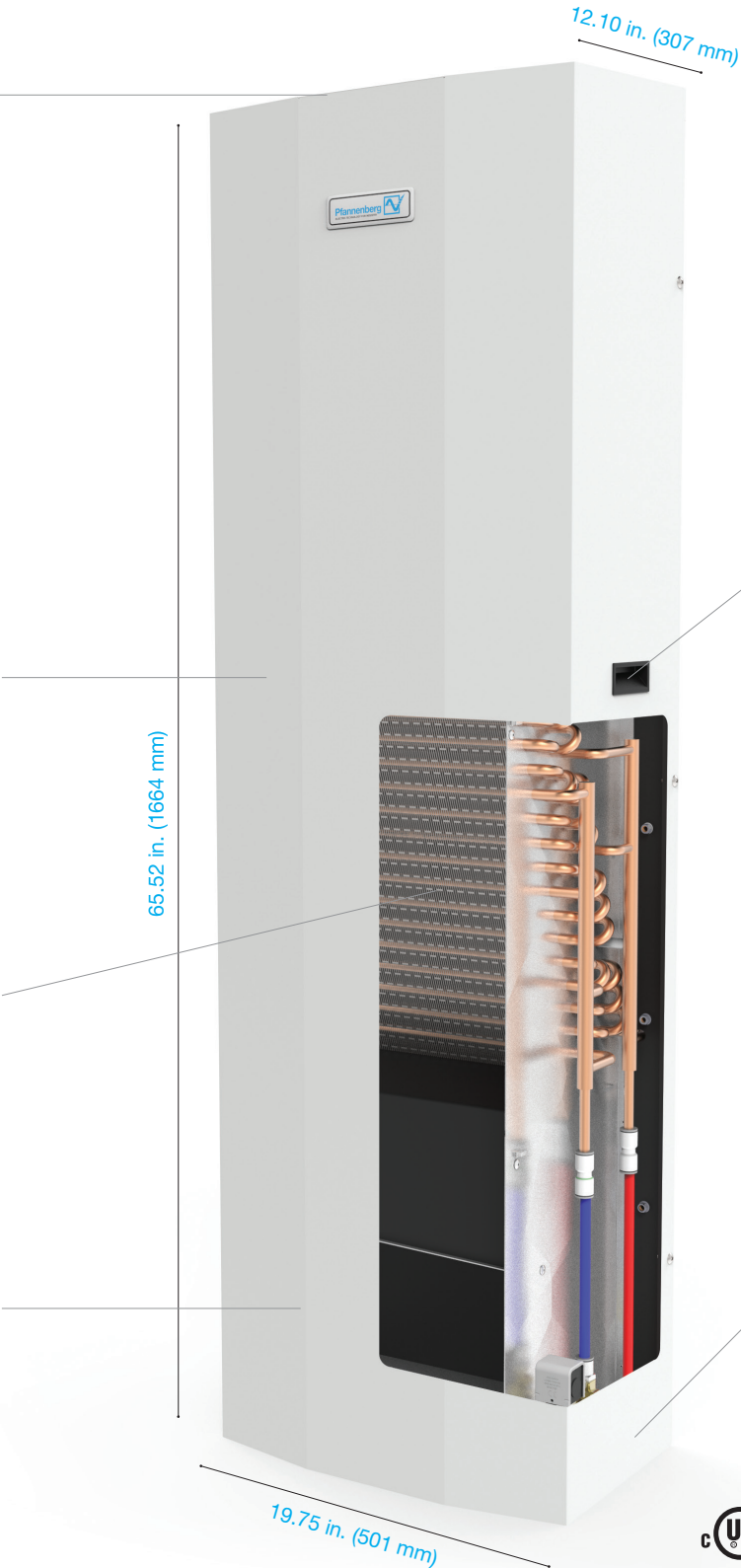
Powder coated steel or stainless steel cover designed for manufacturing environments. Easily painted to match enclosure or machine.

Long Airflow Path

Heat exchangers are designed to draw hot air from the top of the enclosure and deliver cool air below the components.

Closed Loop Design

Designed to isolate the external ambient air from the internal air circuit eliminating the risk of contaminants entering the cabinet.



Push to Connect Fittings

Hydronic connectors that supports quick connection to 1/2 inch O.D. hose or 1/2 inch I.D. hose with included adapter. Unlike other units that have rigid permanent connections.

Lifting Handles

Handles are mounted on the cover for easy handling and installation.

Intelligent Control of Water Flow

The adjustable electronic thermostat permits precise control of the electrical enclosure temperature by regulating the coolant flow by activating a solenoid valve. This regulates the coolant flow to minimize coolant waste and increase energy-efficiency.

Condensation Management

Physical barriers allow for condensation to be collected and drained from the system with zero intrusion into the cabinet.



PWS 31002 Series 34121 Btu/h (10000 W) Air to Water Heat Exchangers

Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 31002 Indoor/Outdoor Rated (NEMA Type 12/3R/4)	12358720045	230	50/60	163	.71	6	1/2" push in fitting	<66	117 (53)
	12358730045	460	50/60	150	.67	6	1/2" push in fitting	<66	126 (57)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 31002 SS Indoor/Outdoor Rated (NEMA Type 12/3R/4/4x)	12358720048	230	50/60	163	.71	6	1/2" push in fitting	<66	117 (53)
	12358730048	460	50/60	150	.67	6	1/2" push in fitting	<66	126 (57)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

Additional Data	PWS 31002	PWS 31002 SS
Control range (adjustable)	SC	+ 50 ... + 104 / + 10 ... + 40; factory setting + 95 / + 35
Rated flow rate		5 (1150)
Maximum water pressure	PSIG	145 (10)
NEMA Type rating		12/3R/4/4x

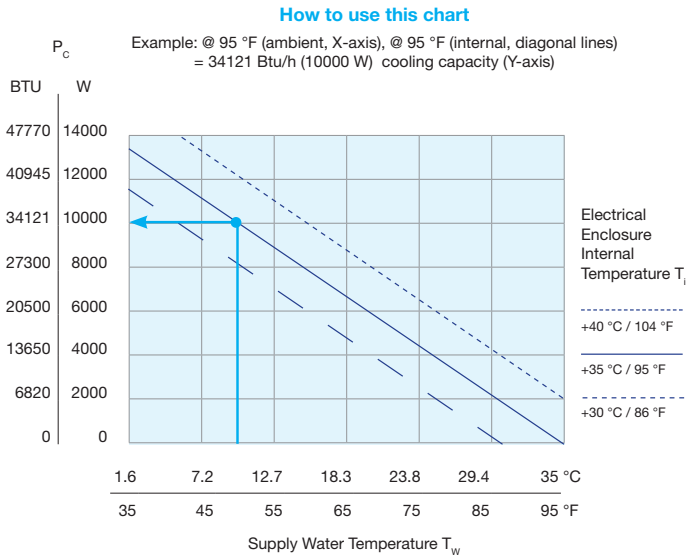


For additional technical data, drawings and manuals.
www.pfannenberguna.com

Available Models:



Cooling Capacity Performance Curve



PWS 7102

3242 Btu/h

AIR/WATER HEAT EXCHANGERS

The PWS 7000 Series Air/Water Heat Exchangers are our legacy models. The 7102 model offers the narrowest footprint of any of our air/water heat exchangers. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.



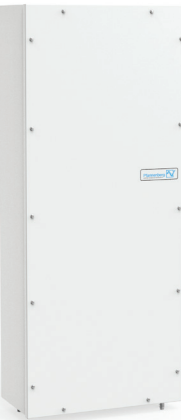
PWS 7102 (3242 Btu/h) Air to Water Heat Exchangers									
Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 7102 <i>Indoor/Outdoor Rated</i> (NEMA Type 12/3R/4)	12351010005	115	60	95	0.80	4	1/2"OD Hose Barb	<48	16.5 (7.5)
	12351020005	230	50/60	84	.52	4	1/2"OD Hose Barb	<48	16.5 (7.5)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 7102 SS <i>Indoor/Outdoor Rated</i> (NEMA Type 12/3R/4/4x)	12351010008	115	60	95	0.80	4	1/2"OD Hose Barb	<48	16.5 (7.5)
	12351020008	230	50/60	84	.52	4	1/2"OD Hose Barb	<48	16.5 (7.5)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

PWS 7332

10748 Btu/h

AIR/WATER HEAT EXCHANGERS

The PWS 7332 is compatible with existing popular PWS 7000 series units still in the field. Installation is service friendly requiring no elaborate reworking of the mounting cutout. [Need a cool liquid source?](#) Pair this unit with one of our packaged chillers.



PWS 7332 Series (10748 Btu/h) Air to Water Heat Exchangers									
Model Number	Part Number	Voltage (VAC)	Frequency (Hz)	Power Consumption (W)	Nominal (Run) Current (A)	Fuse (maximum)	Fluid Connection	Noise Level (according to EN ISO 3741) dB(A)	Dry Weight (without packaging) lb (kg)
PWS 7332 <i>Indoor/Outdoor Rated</i> (NEMA Type 12/3R/4)	12353010005	115	60	453	3.8	16	1/2"OD Hose Barb	54	51 (23)
	12353020005	230	50/60	295/385	1.3/1.95	6	1/2"OD Hose Barb	54	51 (23)
Design	Housing: galvanized sheet steel Cover: electrostatically powder coated RAL 7035 (light grey); for ANSI 61 grey use part no. ending in ...251								
PWS 7332 SS <i>Indoor/Outdoor Rated</i> (NEMA Type 12/3R/4/4x)	12353010008	115	60	453	3.8	16	1/2"OD Hose Barb	54	51 (23)
	12353020008	230	50/60	295/385	1.3/1.95	6	1/2"OD Hose Barb	54	51 (23)
Design	Housing: stainless steel 304 Cover: stainless steel 304								

ACCESSORIES

External Condensate Evaporation System-KV PTC

External condensate evaporator for the accumulated condensed water.

Suitable for ...	Part number
115 - 230 V 50 / 60 Hz	18314000001



THE BEST LIQUID-COOLED SOLUTION:
Combined Chillers and PWS Air/Water Heart Exchangers

When a liquid cooling source is not available on site, combining Pfannenberger Chillers and PWS Air/Water heat exchangers is the best solution for recirculating water cooling systems for control enclosures. Dedicated to harsh environments, this solution is the perfect match to save energy, reduce maintenance and prevent downtime.



Pfannenberger Water-Cooled Solutions.

Our water-cooled solutions are designed with durable components to ensure the effectiveness and longevity of the critical cooling process at hand. Our chillers, in combination with our air/water heat exchangers, offer decisive advantages:

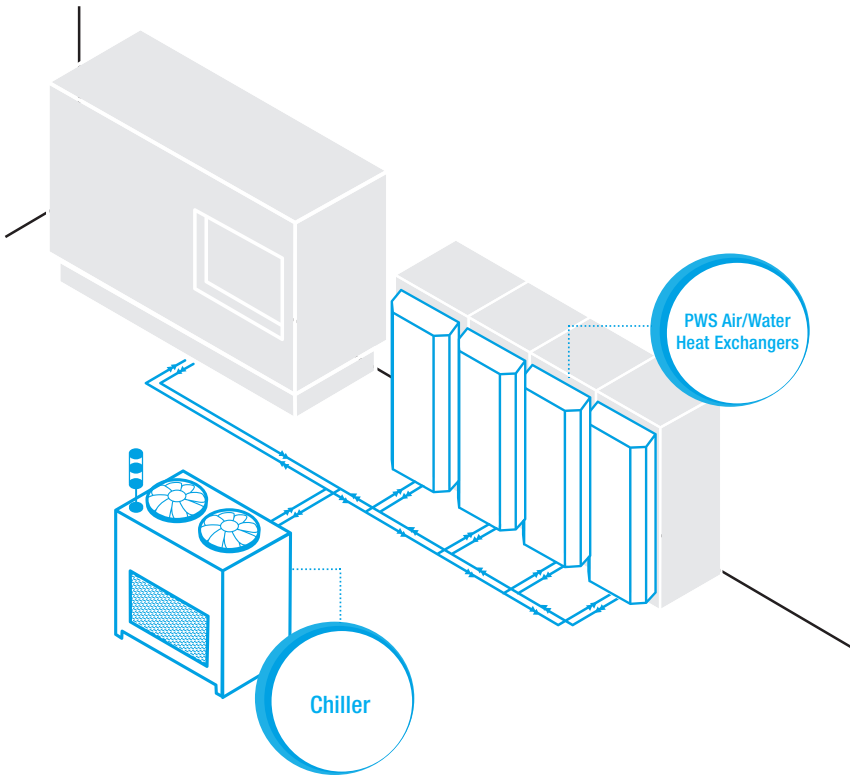
- In applications where power losses must not enter the surrounding space.
- If aggressive ambient air restricts the use of conventional cooling units.
- If a very high IP system is required (up to IP 65).
- If maintenance-free cooling units are necessary.

Water-cooled solution provide the most efficient enclosure cooling when ambient conditions are at their worst.

The Advantages of Closed-Loop Liquid Cooling

With Manufacturing space at a premium, machine packages have become smaller, liquid cooling has emerged as the most efficient and economical means of removing process heat.

Liquid cooling is especially well adapted to hot, dirty environments, where it provides a method of removing the heat from the machine and not contributing additional heat back into the environment.



CC and EB Series Packaged Chillers

Closing the Loop for Industrial Fluid Cooling Applications

Pfannenberger offers a versatile range of packaged chillers, ranging in sizes from less than ½ Ton to 30 Tons insuring the proper capacity available for most applications. These packaged chillers are ready to use requiring only piping and power to install as part of your solution for process cooling applications - we'll even provide the coolant. Ethylene & Propylene Glycol coolants, with proper corrosion inhibitors are available in a variety of packaging options – both full strength and pre-mixed.

Each chiller model includes the pump, tank, refrigeration system and controls required for simple installation and reliable, efficient operation.

Our knowledgeable applications staff is always on hand to discuss the application and to make sure that a proper selection is made. **With our many available equipment options we can easily customize our standard chillers to meet specific application requirements.**

These chillers are a perfect match for Pfannenberger Series PWS Air/Water Heat Exchangers when a local source of cooling is not available.



PRODUCT EXPERTISE

Service Friendliness

Minimum MTTR (Mean Time To Repair) and the shortest time needed to replace units thanks to service-friendly accessibility, standardized parts and a carefully thought out plug-and-play concept minimizing your repair costs and downtimes.



Energy Efficiency

Our chillers achieve top grades in energy consumption. They can be centralized, using a single chiller that serves multiple cooling needs, or decentralized where each application or machine has its own chiller. Each approach has its advantages. It is also possible to have a combination of both centralized and decentralized chillers, especially if the cooling requirements are the same for some applications or points of use.



Reliability

Our customers demand performance that offers the dependability and reliability they can count on. We are committed to the highest level of design and manufacturing accuracy to make sure your chiller performs as expected. More than 20 years of experience in the field of re-cooling and the use of high-quality components ensure optimum long-term stability and top MTBF (Mean Time Between Failures).

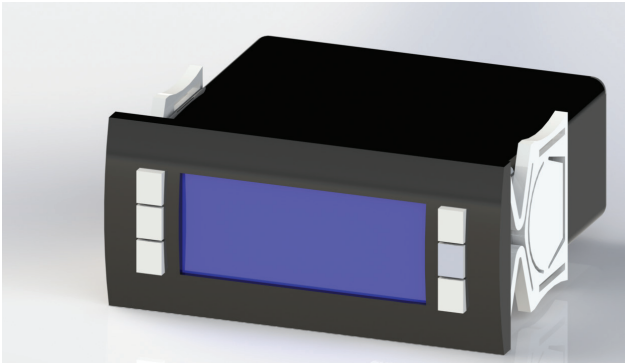
Design

Whether our products are cooling oil or water, Pfannenberg has well-developed global expertise in the design and manufacture of packaged refrigeration products for industrial environments. Pfannenberg's process chillers optimize three basic areas to perform as one: the refrigeration circuit, the hydraulic circuit and controls.



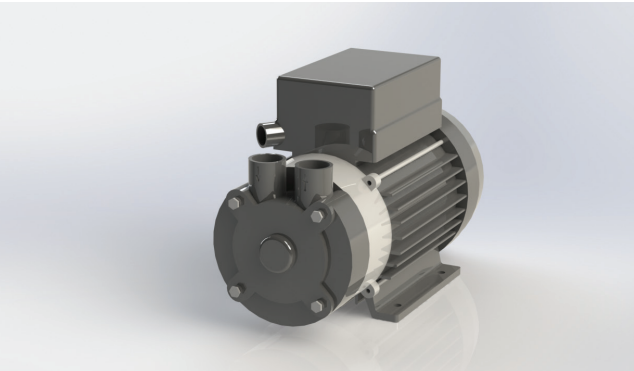
Hydraulic System

Circulating and storing the chilled fluid is the function of the hydraulic circuit. Our standard chillers include high-quality hydraulic components that are selected to support a wide range of applications. Pumps provide flexibility in terms of both flow rate and pressure capabilities. The use of non-ferrous materials for wetted parts promotes longer pump life, avoiding premature failure.



Refrigeration System

Since the natural tendency of heat is to move from a higher temperature medium to one with a lower temperature, the chiller's mechanical refrigeration system is needed to maintain cool fluid temperatures. This assures a constant cooling circuit. Pfannenberg's engineers carefully select the components of this system to maximize performance, efficiency & serviceability. Industrial compressors & fans, extended surface evaporators & condensers, along with the right refrigerant for the application, are seamlessly integrated to achieve the optimum result.



Control System

Simple & effective controls allow the mechanical components to work together to meet various operating requirements. Digital controllers are connected to sensors that measure temperature, and switches that confirm pressure, flow and level. This provides the continuous logical instructions needed to deliver reliable liquid cooling & circulation. **Options are also available to provide remote monitoring and/or control.**



CHILLERS



Whatever the application

Heat is a single common by-product of today's manufacturing machines that include the advanced automation technology required for both high speed operation and high precision. Components such as spindle motors, variable frequency drives, laser and x-ray sources all require cooling to operate properly and reliably – most often in the very adverse manufacturing environments.

With manufacturing space at a premium, machine packages have become smaller and liquid cooling has emerged as the most efficient and economical means of removing process heat. Liquid cooling is especially well adapted to hot, dirty environments, where it provides a method of removing the heat from the machine and not contributing additional heat back into the environment.



...the perfect solution

Pfannenberg's extensive background providing cooling for a wide variety of machines including machining centers, printing presses, wood working machines, welding systems, packaging machines and food processing machines, to name a few, allows us to apply proven cooling technology to new applications.

Our application engineering team works to match our standard products with as many applications as possible and also works closely with our product engineers to offer custom solutions when required. This continuous interaction allows continuous product development that is always in keeping with the needs of the market.



Why Choose a Packaged Chiller System?

Pfannenberg's packaged chillers are versatile and ideal for applications that have cooling requirements from less than a half a ton up to 30 tons. All chillers are shipped as factory packaged systems requiring only field power and piping to provide recirculated chilled coolant to virtually any process. **Pfannenberg's new compact CC Chillers are ideal for quick setup and trouble free operation.**

CC & EB Series Packaged Air Cooled Chillers

Packaged and ready to use, Pfannenberg chillers require only piping & power to install a solution for process cooling applications – we'll even provide the coolant.

- Each chiller model includes the pump, tank, refrigeration system and controls required for simple installation and reliable, efficient operation.
- Model sizes ranging from a ½ Ton up to 30 Tons insure that the proper capacity is available for most applications.
- Ethylene & propylene glycol coolants with proper corrosion inhibitors are available in a variety of packaging options – both full strength and pre-mixed.
- Equipment options are available to easily customize standard chillers to meet specific application requirements.
- Our knowledgeable applications staff is always on hand to discuss the application and to make sure that a proper selection is made.
- These chillers are a perfect match for Pfannenberg Series PWS Air/Water Heat Exchangers when a local source of cooling is not available.



PWW Water to Water Heat Exchangers

When available water is too cold or contaminated to be directly circulated to certain devices or vessels, Pfanneneberg's PWW Heat Exchangers are the best solution to deliver clean coolant at optimum temperatures for critical needs.

- Durable components to ensure the effectiveness and longevity of the critical cooling process at hand.
- Each unit offers two isolated water circuits - one on the supply side, and one on the process side.
- Coolant reservoir and circulating pump included in the process side.
- Electronically actuated ball valve included in the supply side or modulating source water flow rate in order to maintain the desired process and/or equipment temperature.



Selecting the correct Pfannenberg Chiller

Use the chart below to help you select the proper chiller for your application. For questions please consult with the factory or visit our website for the latest charts, diagrams, drawings and sizing materials.



STEP 1
WHAT IS THE HEAT LOAD?
Determine the heat load. There are several ways to determine the heat load depending on the application. Understanding the process is essential to calculating an accurate heat load.



STEP 2
COOLANT TYPE, TEMPERATURE & FLOW RATE
Determine the coolant, its target temperature and the flow rate that the chiller must provide to the process. This is determined by the method from which the heat is transferred from the process to the coolant and the type of coolant being used. For example, water has different characteristics than oil.



STEP 3
IDENTIFY INSTALLATION ENVIRONMENT
In what environment will the chiller be installed? Indoor applications for example can see high temperatures and dirty atmospheres, while outdoor installations can experience both low and high ambient temperatures. This can effect chiller sizing and require accessories such as air filters, sump heaters, etc.



STEP 4
USE CHILLER PERFORMANCE CURVES
Now use the chiller performance curves available* to select a chiller model that meets or exceeds the required capacity based on the chilled water supply temperature and the highest expected ambient air temperature. Consideration should be given to the safety margin of the application with respect to available frame sizes to maximize the value of the chiller selection.



STEP 5
CHECK PUMP PERFORMANCE CURVES
Check the pump performance curves available* to ensure that the pump will provide enough pressure at the design flow rate to satisfy the application. Some liquid cooled systems have small coolant flow paths or longer distances that can have higher than average pressure losses.



STEP 6
FINAL SELECTION
Finally, consider that the remaining application requirements such as power characteristics, control options, footprint, agency listing, color, etc. are met by the selected standard Pfannenberg chiller. Choosing a standard chiller will bring you greater reliability, easier service with common spare parts and global support.

CHILLER QUICK SELECTION CHART

Type	Cooling Capacity Btu/h	Rated Voltage	Dimensions H x W x D Inches (mm)	Approvals				Page
				cUL	CSA	ETL	CE	
CC 6101	4056	115 V / 230 V	28 (711) x 24 (610) x 19 (483)	●	●	●	●	104
CC 6201	6551	115 V / 230 V	28 (711) x 24 (610) x 19 (483)	●	●	●	●	104
CC 6301	10586	115 V / 460 V	28 (711) x 24 (610) x 19 (483)	●	●	●	●	104
CC 6401	13268	460 V	42 (1067) x 24 (610) x 27 (483)	●	●	●	●	104
CC 6501	19960	460 V	42 (1067) x 24 (610) x 27 (483)	●	●	●	●	104
CC 6601	23100	460 V	42 (1067) x 24 (610) x 27 (483)	●	●	●	●	104
EB 30 WT	16700	460 V	42 (1067) x 22 (559) x 24 (610)	●	●	●	●	106
EB 60 WT	21800	460 V	42 (1067) x 22 (559) x 24 (610)	●	●	●	●	106
EB 90 WT	43000	460 V	55 (1397) x 28 (711) x 30 (762)	●	●	●	●	106
EB 150 WT	67500	460 V	55 (1397) x 28 (711) x 30 (762)	●	●	●	●	106
EB 220 WT	88000	460 V	66 (1676) x 28 (711) x 30 (762)	●	●	●	●	106
EB 250 WT	94500	460 V	56 (1422) x 31 (787) x 48 (1219)	●	●	●	●	108
EB 300 WT	112000	460 V	56 (1422) x 31 (787) x 66 (1676)	●	●	●	●	108
EB 400 WT	151500	460 V	56 (1422) x 31 (787) x 66 (1676)	●	●	●	●	108
EB 450 WT	190800	460 V	57 (1448) x 30 (762) x 74 (1880)	●	●	●	●	108
EB 550 WT	218400	460 V	57 (1448) x 30 (762) x 74 (1880)	●	●	●	●	108
EB 700 WT	294000	460 V	82 (2083) x 35 (889) x 90 (2286)	●	●	●	●	108
EB 900 WT	373200	460 V	82 (2083) x 35 (889) x 90 (2286)	●	●	●	●	108

WATER TO WATER HEAT EXCHANGERS QUICK SELECTION CHART

Type	Cooling Capacity Btu/h	Rated Voltage	Dimensions H x W x D Inches	Approvals				Page
				cUL	CSA	ETL	CE	
PWW 3242	81960	460 V	36 (914) x 22 (559) x 25 (635)	●	●	●	●	110
PWW 3482	163920	460 V	49 (1245) x 28 (711) x 30 (762)	●	●	●	●	110

● available

Application Example



DID YOU KNOW?

In addition to water and Glycol coolants, Pfannenberg chillers can also be used to chill oil for various applications such as cutting machines, drill presses and hydraulic circuits.

Contact Pfannenberg today to discuss the requirements of your specific project.



CC 6101- 6601 | CHILLERS

1200 - 6800 W / 4056 - 23100 Btu/h /

0.3 - 1.9 TONS

High Airflow for Efficient Operation

Axial fans deliver high volume airflow across the condenser for effective dissipation of waste heat while fan cycling provides maximum refrigeration efficiency and energy conservation.

Designed to Handle Tough Environments

Large, finned-tube condensers provide a high level of energy efficiency and fouling resistance.

Larger Surface Area Brazed-plate Evaporators for Lower Energy Usage

With large heat transfer surfaces in a compact size, brazed-plate evaporators offer efficient operation for both heat transfer and coolant flow, resulting in reduced pumping energy. For optimum performance, externally equalized thermal expansion valves are utilized to continuously manage refrigerant flow based on load.

Long Service Life & Wider Range of Performance

Centrifugal coolant pumps offer a wide range of flow and pressure capabilities to fulfill a variety of pipe-run requirements. Non ferrous construction eliminates corrosion and problems surrounding coolant contamination.

Large Coolant Capacity to Absorb Rapid Changes in Heat Load

Vented polypropylene reservoir tanks effectively accommodate rapid changes in heat load thereby permitting the system to cycle efficiently.

High Efficiency, Long Life Compressors

Heavy-duty reciprocating compressors provide high efficiency and long service life.

Durable, Weatherproof Construction

Galvanized steel frame and panels are polyester powder coated in light grey (RAL 7035) to resist corrosion.

Continuous Display Info & Remote Operation

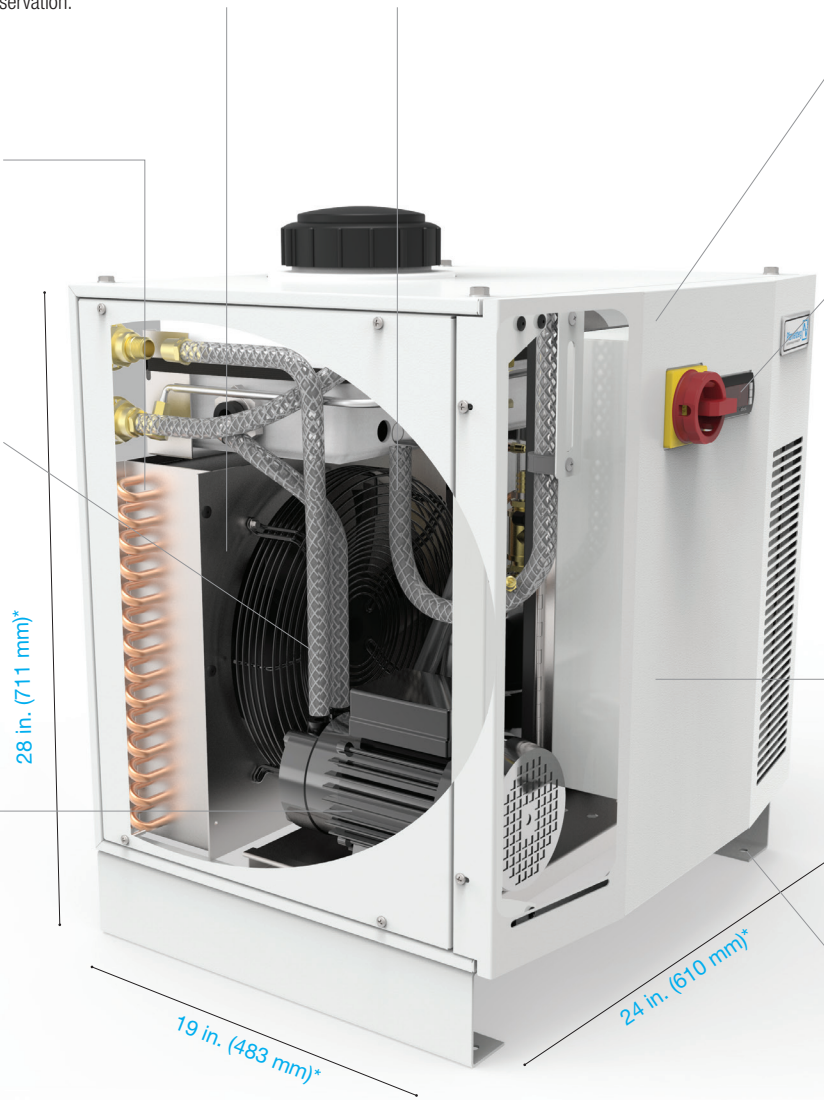
The feature-rich, plug in controller with digital display provides ease of setup and monitoring of all operating conditions including warning and alarm indications. Remote start/stop capability and general alarm contacts are provided. An optional wired remote control pad with 400 ft. range is available.

Protected Electronics and Controls Support Safe & Efficient Operation

Electrical controls for safe and efficient operation include high, low and fan control refrigerant pressure switches, coolant flow and freeze protection. All sensitive devices are contained within a NEMA 4 rated enclosure and built to UL508a standards.

Flexible Mounting

Channel bases are included to facilitate lift truck handling and permanent foundation mounting. Optional casters are available.



**Note: The size listed on this page is for the CC 6101 - 6301 Models. Please see the chart on the opposite page for dimensions of our CC 6401 - 6601 Models.*

The **CC 6101 - 6601 Series** packaged chillers include a variety of frame sizes and capacities to fulfill a wide range of applications.

CC 6101 - 6601 Series (4056 - 23100 Btu/h) Packaged Compact Chillers

Model Number	Part Number RAL 7035 (Light Grey)	Voltage (V/Ph/Hz)	Capacity*			Nominal Current (A)	Tank Volume (gal)	Coolant Connections (NPT-F)	Width in (mm)	Depth in (mm)	Height in (mm)	Dry Weight lb (kg)
			(Btu/h)	(kW)	(Tons)							
CC 6101 Indoor/Outdoor Rated (NEMA Type 12/4)	42630115112	115/1/60	4056	1.2	0.34	18	2.7	1/2	24 (610)	19 (483)	28 (711)	200 (91)
	42630115212	230/1/60	4056	1.2	0.34	9	2.7	1/2	24 (610)	19 (483)	28 (711)	200 (91)
CC 6201 Indoor/Outdoor Rated (NEMA Type 12/4)	42630175112	115/1/60	6551	1.9	0.55	21	2.7	1/2	24 (610)	19 (483)	28 (711)	200 (91)
	42630175212	230/1/60	6551	1.9	0.55	9.3	2.7	1/2	24 (610)	19 (483)	28 (711)	200 (91)
CC 6301 Indoor/Outdoor Rated (NEMA Type 12/4)	42630245112	115/1/60	10586	3.1	0.88	22	2.7	1/2	24 (610)	19 (483)	28 (711)	200 (91)
	42630245212	460/3/60	10586	3.1	0.88	11.5	2.7	1/2	24 (610)	19 (483)	28 (711)	200 (91)
CC 6401 Indoor/Outdoor Rated (NEMA Type 12/4)	42630355312	460/3/60	13268	3.9	1.11	9.4	6.8	3/4	24 (610)	27 (483)	42 (1067)	260 (118)
CC 6501 Indoor/Outdoor Rated (NEMA Type 12/4)	42630505312	460/3/60	19960	5.8	1.66	11	6.8	3/4	24 (610)	27 (483)	42 (1067)	260 (118)
CC 6601 Indoor/Outdoor Rated (NEMA Type 12/4)	42630655314	460/3/60	23100	6.8	1.93	13	6.8	3/4	24 (610)	27 (483)	42 (1067)	260 (118)

Design

Rugged construction - (G90) galvanized steel with polyester powder coat finish

* Water @ 64°F CWS / 90°F Ambient / 60Hz

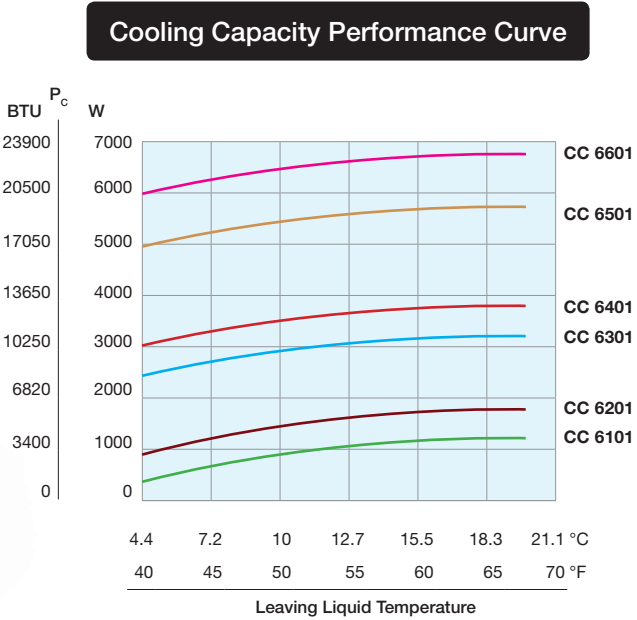
For additional technical data, drawings and templates.
www.pfannenbergusa.com

1 Ton = 12,000 Btu/h = 3517 Watts



CC 6101 - 6301
Indoor / Outdoor Rated
(NEMA Type 12)

CC 6401 - 6601
Indoor / Outdoor Rated
(NEMA Type 12)



EB 30-220 WT | CHILLERS

4900 - 25800 W / 16700 - 88000 Btu/h / 1.4 - 7.3 TONS

The **EB 30-220 WT Series** packaged chillers include a variety of frame sizes and capacities to fulfill a wide range of applications. The unique, vertical design allows warm air from the condenser to be discharged conveniently upward.

Operating Status Indication

Pfannenberg Series BR 50 Stacklights are included with all models to indicate operating conditions at a glance.

High Efficiency, Long Life Compressors

Heavy-duty reciprocating compressors provide high efficiency and long service life. Crankcase heaters are included with all models.

Large Surface Area Brazed-plate Evaporators for Low Energy Usage

With large heat transfer surfaces in a compact size, brazed-plate evaporators offer efficient operation for both heat transfer and coolant flow, resulting in reduced pumping energy. For optimum performance, externally equalized thermal expansion valves are utilized to continuously manage refrigerant flow based on load. (not pictured)

Long Service Life & Wider Range of Performance

Centrifugal coolant pumps offer a wide range of flow and pressure capabilities to fulfill a variety of pipe-run requirements. Stainless steel construction eliminates corrosion and problems surrounding coolant contamination.

Large Coolant Capacity to Absorb Rapid Changes in Heat Load

Insulated vented polypropylene reservoir tanks effectively accommodate rapid changes in heat load thereby permitting the system to cycle efficiently.

High Airflow for Efficient Operation

Axial fans deliver high volume airflow across the condenser for effective dissipation of waste heat while fan cycling provides maximum refrigeration efficiency and energy conservation.

Durable, Weatherproof Construction

Galvanized steel frame and panels are polyester powder coated in light grey (RAL 7035) to resist corrosion.

Designed to Handle Tough Environments

Large, finned-tube condensers provide a high level of energy efficiency and fouling resistance.

Continuous Display Info & Remote Operation

The feature-rich, plug in controller with digital display provides ease of setup and monitoring of all operating conditions including warning and alarm indications. Remote start/stop capability and general alarm contacts are provided. An optional wired remote control pad with 400 ft. range is available.

Protected Electronics and Controls Support Safe & Efficient Operation

Electrical controls for safe and efficient operation include high, low and fan control refrigerant pressure switches, coolant flow and freeze protection. All sensitive devices are contained within a NEMA 4 rated enclosure and built to UL508a standards.

Flexible Mounting

Channel bases are included to facilitate lift truck handling and permanent foundation mounting. Optional casters are available.



*Note: The size listed on this page is for the EB 30 WT & EB 60 WT Models. Please see the chart on the opposite page for dimensions of our EB 90 - EB 220 WT Models.



EB 30 - 220 WT Series (16700 - 88000 Btu/h) Packaged Chillers												
Model Number	Part Number RAL 7035 (Light Grey)	Voltage (V/Ø/Hz)	Capacity*			Nominal Current (A)	Tank Volume (gal)	Coolant Connections (NPT-F) (in)	Width in (mm)	Depth in (mm)	Height in (mm)	Dry Weight lb (kg)
			(Btu/h)	(kW)	(Tons)							
EB 30 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42530305300	460/3/60	16700	4.9	1.39	5.5	8	3/4	22 (559)	24 (610)	42 (1067)	209 (95)
EB 60 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42530605300	460/3/60	21800	6.4	1.82	6.4	8	3/4	22 (559)	24 (610)	42 (1067)	311 (141)
EB 90 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42530905300	460/3/60	43000	12.6	3.58	12	13	1	28 (711)	30 (762)	55 (1397)	397 (180)
EB 150 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42531505300	460/3/60	67500	19.8	5.63	15	13	1	28 (711)	30 (762)	55 (1397)	496 (225)
EB 220 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42532205300	460/3/60	88000	25.8	7.33	19.3	13	1	28 (711)	30 (762)	66 (1676)	660 (300)
Design	Rugged construction - (G90) galvanized steel with polyester powder coat finish											

* Supply Water @ 64°F / 90°F Ambient / 60Hz



For additional technical data, drawings and manuals.
www.pfannenbergusa.com

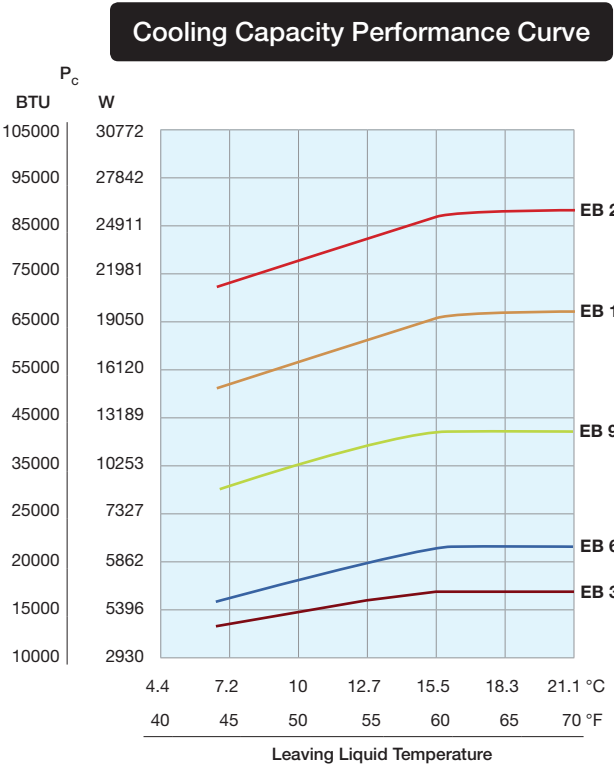


1 Ton = 12,000 Btu/h = 3517 Watts



EB 30 - 60 WT
Indoor / Outdoor Rated
(NEMA Type 12/4 panel)

EB 90 - 220 WT
Indoor / Outdoor Rated
(NEMA Type 12/4 panel)



EB 250 - 900 WT | CHILLERS

27700 - 109300 W / 94500 - 373200 Btu/h /

7.9 - 31.1 TONS

High Airflow for Efficient Operation

Axial fans deliver high volume airflow across the condenser for effective dissipation of waste heat while fan cycling provides maximum refrigeration efficiency and energy conservation.

High Efficiency, Long Life Compressors

Heavy-duty reciprocating or scroll type compressors provide high efficiency and long service life. Crankcase heaters are included with all models.

Designed to Handle Tough Environments

Large, finned-tube condensers provide a high level of energy efficiency and fouling resistance.

Large Surface Area Brazed-plate Evaporators for Low Energy Usage

With large heat transfer surfaces in a compact size, brazed-plate evaporators offer efficient operation for both heat transfer and coolant flow, resulting in reduced pumping energy. For optimum performance, externally equalized thermal expansion valves are utilized to continuously manage refrigerant flow based on load. (not pictured)

Flexible Mounting

Channel bases are included to facilitate lift truck handling and permanent foundation mounting. Optional casters are available.



*Note: The size listed on this page is for the EB 250 WT model. Please see the chart on the opposite page for dimensions of our EB 300 - EB 900 WT Models.

The EB 250-900 WT Series packaged chillers include a variety of frame sizes and capacities to fulfill a wide range of applications. The unique, vertical design allows warm air from the condenser to be discharged conveniently upward.

Durable, Weatherproof Construction

Galvanized steel frame and panels are polyester powder coated in light grey (RAL 7035) to resist corrosion.

Long Service Life & Wider Range of Performance

Centrifugal coolant pumps offer a wide range of flow and pressure capabilities to fulfill a variety of pipe-run requirements. Stainless steel construction eliminates corrosion and problems surrounding coolant contamination.

Continuous Display Info & Remote Operation

The feature-rich, plug in controller with digital display provides ease of setup and monitoring of all operating conditions including warning and alarm indications. Remote start/stop capability and general alarm contacts are provided. An optional wired remote control pad with 400 ft. range is available.

Protected Electronics and Controls Support Safe & Efficient Operation

Electrical controls for safe and efficient operation include high, low and fan control refrigerant pressure switches, coolant flow and freeze protection. All sensitive devices are contained within a NEMA 4 rated enclosure and built to UL508a standards.

EB 250 - 900 WT Series (94500 - 373200 Btu/h) Packaged Compact Chillers

Model Number	Part Number RAL 7035 (Light Grey)	Voltage (V/Ph/Hz)	Capacity*			Nominal Current (A)	Tank Volume (gal)	Coolant Connections (NPT-F)	Width in (mm)	Depth in (mm)	Height in (mm)	Dry Weight lb (kg)
			(Btu/h)	(kW)	(Tons)							
EB 250 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42532505320	460/3/60	94500	27.7	7.9	23.1	18.5	1	31 (787)	48 (1219)	56 (1422)	882 (400)
EB 300 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42533005320	460/3/60	112000	32.8	9.3	28.1	31.7	1-1/2	31 (787)	66 (1676)	56 (1422)	926 (420)
EB 400 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42534005320	460/3/60	151500	44.4	12.6	36.4	31.7	1-1/2	31 (787)	66 (1676)	56 (1422)	1323 (600)
EB 450 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42534505320	460/3/60	190800	55.9	15.9	37	68	1-1/2	30 (762)	74 (1880)	57 (1448)	1446 (656)
EB 550 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42535505320	460/3/60	218400	64.0	18.2	43	68	1-1/2	30 (762)	74 (1880)	57 (1448)	1482 (672)
EB 700 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42537005320	460/3/60	294000	86.1	24.5	47	93	2	35 (889)	90 (2286)	82 (2083)	2273 (1031)
EB 900 WT Indoor/Outdoor Rated (NEMA Type 12/4)	42539005320	460/3/60	373200	109.3	31.1	63	93	2	35 (889)	90 (2286)	82 (2083)	2370 (1075)

Design

Rugged construction - (G90) galvanized steel with polyester powder coat finish

* Water @ 64°F CWS / 90°F Ambient / 60Hz

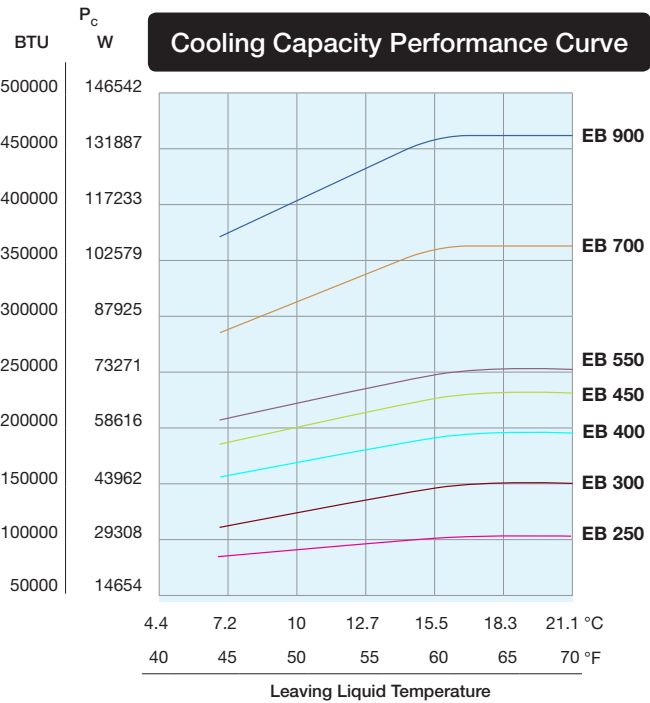


For additional technical data, drawings and manuals.
www.pfannenbergusa.com

1 Ton = 12,000 Btu/h = 3517 Watts



EB 250 - 900 WT
Indoor / Outdoor Rated
(NEMA Type 12)



For additional technical data, drawings and manuals. www.pfannenbergusa.com

Subject to technical amendments and misprints.

PWW 3242-3482 | WATER/WATER
HEAT EXCHANGERS
24000 - 48000 W / 81960 - 163920 Btu/h /
6.8 - 13.7 TONS

PWW Series Water/Water Heat Exchangers are ideal for utilizing a contaminated water source, such as river water or low quality tower water without compromising the critical liquid cooled components. Two separate circuits allow the heat to be transferred from the "dirty" side to the clean side protecting electronic components such as liquid cool drives.

Operating Status Indication

Pfannenberg Series BR 50 Stacklights are included with all models to indicate operating conditions at a glance.

Durable, Weatherproof Construction

Galvanized steel frame and panels are polyester powder coated in light grey (RAL 7035) to resist corrosion.

Long Service Life & Wider Range of Performance

Centrifugal coolant pumps offer a wide range of flow and pressure capabilities to fulfill a variety of pipe-run requirements. Stainless steel construction eliminates corrosion and problems surrounding coolant contamination.

Large Coolant Capacity to Absorb Rapid Changes in Heat Load

Insulated vented polypropylene reservoir tanks effectively accommodate rapid changes in heat load.



Continuous Display Info & Remote Operation

The feature-rich, plug in controller with digital display provides ease of setup and monitoring of all operating conditions including warning and alarm indications. Remote start/stop capability and general alarm contacts are provided. An optional wired remote control pad with 400 ft. range is available.

Protected Electronics and Controls Support Safe & Efficient Operation

Electrical controls for safe and efficient operation include coolant flow and level monitoring. All electrical components are contained within a NEMA 4 rated enclosure and built to UL508a standards.

Flexible Mounting

Channel bases are included to facilitate lift truck handling and permanent foundation mounting. Optional casters are available.



*Note: The size listed on this page is for the PWW 3242 model. Please see the chart on the opposite page for dimensions of our PWW 3482 model.

PWW 3242 - 3482 Series (81960 - 163920 Btu/h) Water/Water Heat Exchangers

Model Number	Part Number RAL 7035 (Light Grey)	Voltage (V/Ø/Hz)	Capacity*			Nominal Current (A)	Tank Volume (gal)	Coolant Connections (JIC)	Width in (mm)	Depth in (mm)	Height in (mm)	Dry Weight lb (kg)
			(Btu/h)	(kW)	(Tons)							
PWW 3242 Indoor/Outdoor Rated (NEMA Type 12/4)	42522405301	400-460/ 3/50-60	81960	24	6.8	1.9	8	1.0	22 (559)	25 (635)	36 (914)	220 (100)
PWW 3482 Indoor/Outdoor Rated (NEMA Type 12/4)	42524805301	400-460/ 3/50-60	163920	48	13.7	2.3	13	1.0	28 (711)	30 (762)	49 (1245)	400 (181)
Design	Rugged construction - (G90) galvanized steel with polyester powder coat finish											

* @10 °F difference between entering supply water & leaving process water at 1:1 flow rate.



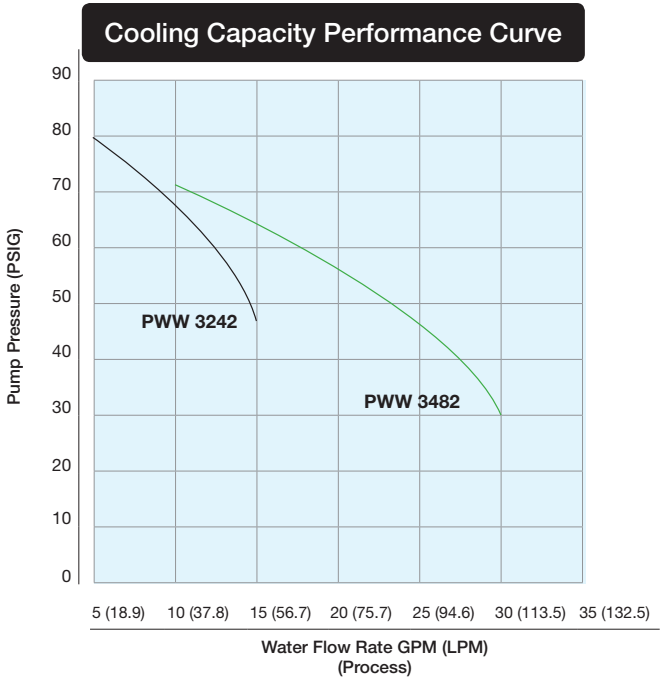
For additional technical data,
drawings and manuals.
www.pfannenbergusa.com



1 Ton = 12,000 Btu/h = 3517 Watts



PWW 3242 - 3482
Indoor / Outdoor Rated
(NEMA Type 12)



Heaters, Thermostats and Hygrostats

Additional Protection for Your Electronics

The formation of condensation is one of the biggest dangers for electrical enclosures. As long as they are working under load, their own warmth prevents water from condensing. If the process is switched off, the electronics cool down. This is where our control cabinet heaters (radiant heaters and fan heaters) provide additional protection for your electronics.

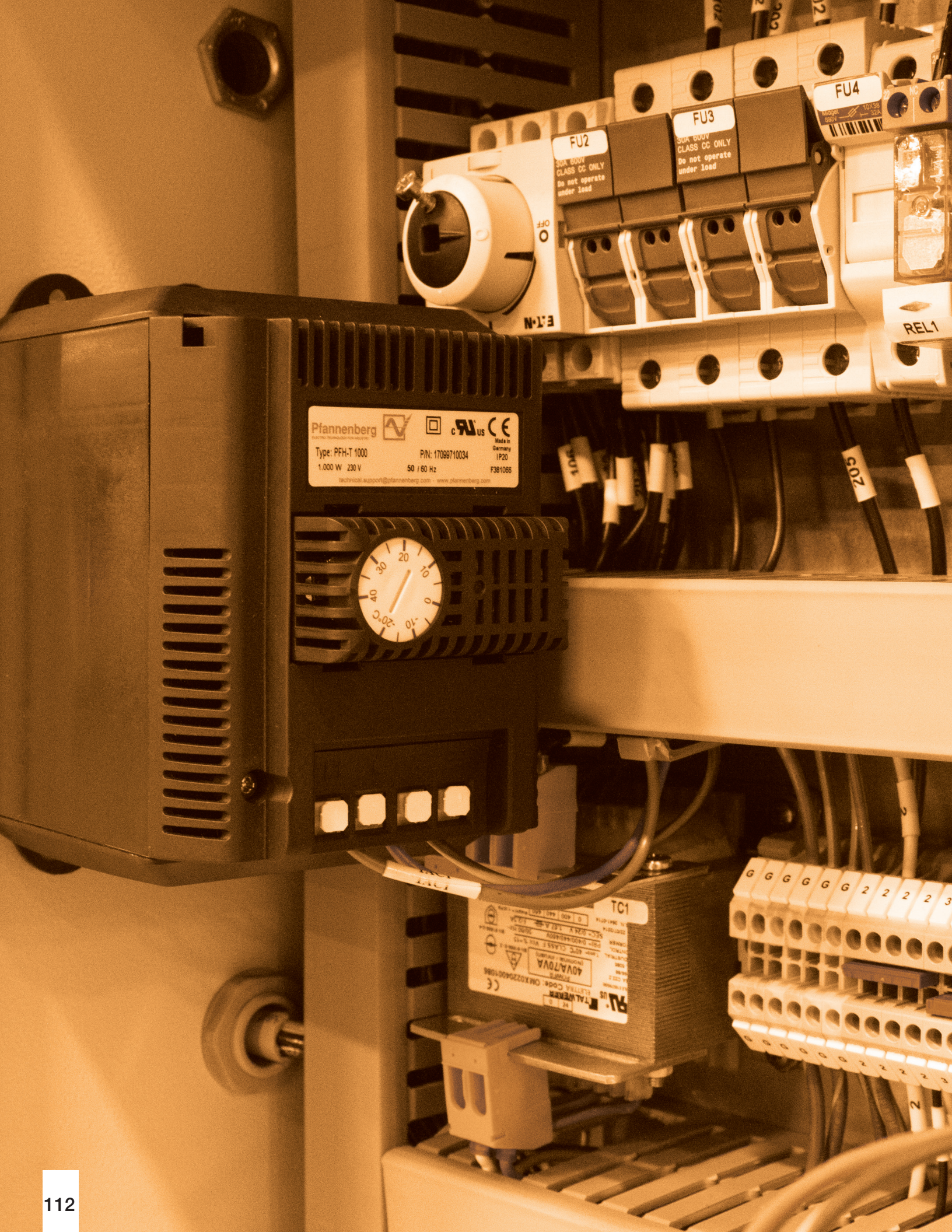
We offer a wide variety of performance class control cabinet heaters which are complemented by thermostats and hygrostats. Combined as a solution, they ensure that the temperature inside the control cabinet is always correct and that the formation of condensation is prevented.

The control of Filterfans® by the FLZ 530 Thermostat represents an intelligent solution for control of the fan, preventing excessive energy usage and reducing the maintenance cost associated with the frequency of replacing filters.

Additionally using a thermostat or hygrostat results in greater reliability of your production process:

- Pinpoint distribution and constant temperature in the control cabinet.
- Reduced energy consumption and optimization of the efficiency of the heaters.
- Additional savings on energy, materials and time.

Pfannenberg's heaters, thermostats and hygrostats expand Pfannenberg's protection to additional outdoor applications such as ATMs, Kiosks, Ticket Machines etc.



THERMAL MANAGEMENT OF ENCLOSURES

Monitoring Temperature, Heating & Controlling Condensate

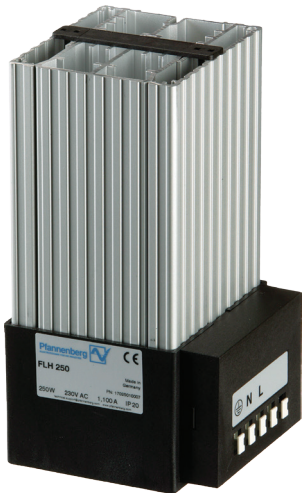
Pfannenberg's Heaters, Thermostats and Hygrostats detect and keep ambient conditions above dew point to avoid the harmful effects of condensation on your electronics. They can be used as a standalone product or in partnership with our Filterfan® and Cooling Unit product lines.



FLH Heaters

This type of heating is ideal for use in larger electrical enclosures. They have an integrated fan that assists the natural convection and provides fast and even distribution of the heat in the electrical enclosure.

The fan heaters are used in combination with a thermostat or hygrostat, for the avoidance of excessively low temperatures or excessively high humidity in the electrical enclosure and also help to avoid the formation of corrosion.



PFH-T Fan Heaters with Thermostat

The PFH-T fan heater with thermostat is designed to protect electronics from the effects of low temperatures such as corrosion, freezing or condensation, which can damage critical components within a control enclosure.

FLZ Thermostats

Thermostats are used as temperature controllers and, therefore, for the control of Filterfans® or electrical enclosure heaters. They are available with N.C. (normally closed) / N.O. (normally open) and changeover contacts. In combination with control cabinet heaters you can ensure, besides temperature control, that the control cabinet is 'artificially' dehumidified, in particular in outdoor applications. That means that the temperature is kept above the dew point so that no water condenses out of the air, which could lead to short circuits due to the formation of condensation.



Hygrostats

Hygrostats switch on electrical enclosure heaters or Filterfans® when a preset relative humidity is exceeded. The relative humidity is kept above the dew point and the condensation of water on electrical components and the corrosion of unprotected sheet metal is prevented. A new electronic combination device unites thermostat and hygrostat in one housing.



HEATERS AND THERMOSTATS QUICK SELECTION CHART

Type	Heater Power W	Rated voltage	Dimensions WxLxH inches (mm)	Approvals				Page
				UL	cUL	CSA	CE	
PFH-T Series Compact Fan Heaters								
PFH-T 200	200	115 - 230 VAC	3.46 (88) x 5.47 (139) x 5.59 (142)	●	●	●	●	116
PFH-T 400	400	115 - 230 VAC	3.46 (88) x 5.47 (139) x 5.59 (142)	●	●	●	●	116
PFH-T 650	650	115 - 230 VAC	3.46 (88) x 5.47 (139) x 5.59 (142)	●	●	●	●	116
PFH-T 800	800	115 - 230 VAC	3.46 (88) x 5.47 (139) x 5.59 (142)	●	●	●	●	116
PFH-T 1000	1000	115 - 230 VAC	3.46 (88) x 5.47 (139) x 5.59 (142)	●	●	●	●	116
PFH-T 1200	1200	230 VAC	3.46 (88) x 5.47 (139) x 5.59 (142))	●	●	●	●	116
FLH-TF Series Fan Heaters with Thermostat								
FLH-TF 125	125	115 - 230 VAC	5 x 4.1875 x 5.5 (127 x 106 x 140)	●				116
FLH-TF 200	200	115 - 230 VAC	5 x 4.1875 x 5.5 (127 x 106 x 140)	●				116
FLH-TF 400	400	115 - 230 VAC	7 x 6.1875 x 7.5 (178 x 157 x 191)	●				116
FLH-TF 800	800	115 - 230 VAC	7 x 6.1875 x 7.5 (178 x 157 x 191)	●				116
PRH-M Series Mini-Radiant Heaters								
PRH 010-M	10	110 - 250 VAC	1.77 (45) x 2.95 (75) x 1.16 (29.5)	●	●		●	118
PRH 020-M	20	110 - 250 VAC	1.77 (45) x 2.95 (75) x 1.16 (29.5)	●	●		●	118
PRH 030-M	30	110 - 250 VAC	1.77 (45) x 2.95 (75) x 1.16 (29.5)	●	●		●	118
FLH Series Mini Radiant & Fan Heaters								
FLH 030W	30	110 - 250 VAC	3.94 (100) x 2.76 (70) x 1.97 (50)	●	●		●	118
FLH 045W	45	110 - 250 VAC	3.94 (100) x 2.76 (70) x 1.97 (50)	●	●		●	118
FLH 060W	60	110 - 250 VAC	6.89 (175) x 2.76 (70) x 1.97 (50)	●	●		●	118
FLH 075W	75	110 - 250 VAC	6.89 (175) x 2.76 (70) x 1.97 (50)	●	●		●	118
FLH 100W	100	110 - 250 VAC	6.89 (175) x 2.76 (70) x 1.97 (50)	●	●		●	118
FLH 150W	150	110 - 250 VAC	9.84 (250) x 2.76 (70) x 1.97 (50)	●	●		●	118
FLH 250	250	250 VAC	7.34 (186.5) x 3.34 (85) x 4.09 (104)	●	●		●	118
FLH 400	400	400 VAC	8.92 (226.5) x 3.34 (85) x 4.09 (104)	●	●		●	118
FLZ Series Thermostats								
FLZ 510	-	100 - 250 VAC / Max. 30 W DC	2.52 x 1.46 x 1.81 (64 x 37 x 46)	●	●	●	●	120
FLZ 520	-	100 - 250 VAC / Max. 30 W DC	2.83 x 1.57 x 1.42 (72 x 40 x 36)	●	●	●	●	120
FLZ 530	-	100 - 250 VAC / Max. 30 W DC	2.83 x 1.57 x 1.42 (72 x 40 x 36)	●	●	●	●	120
FLZ Series Twin Thermostats								
FLZ 541	-	100 - 250 VAC / Max. 30 W DC	3.17 x 2.32 x 1.5 (80.5 x 59 x 38)	●	●		●	122
FLZ 542	-	100 - 250 VAC / Max. 30 W DC	3.17 x 2.32 x 1.5 (80.5 x 59 x 38)	●	●		●	122
FLZ 543	-	100 - 250 VAC / Max. 30 W DC	3.17 x 2.32 x 1.5 (80.5 x 59 x 38)	●	●		●	122
FLZ Series Hygrostats								
FLZ 600	-	100 - 250 VAC / Max. 30 W DC	2.52 x 1.46 x 1.81(64 x 37 x 46)	●	●		●	124
FLZ 610	-	100 - 250 VAC / Max. 30 W DC*	3.17 x 2.32 x 1.5 (80.5 x 59 x 38)	●	●		●	124

* See p.125 for more information

● available

PFH-T

COMPACT FAN
HEATER WITH THERMOSTAT

200 W - 1200 W



Flexible Mounting Options

Unit can be direct mounted or connected to a standard DIN rail **without tools** using the included snap fastener.

Touch-Safe Outer Housing

Well insulated ABS high-temperature resistant plastic housing material ensures that unit remains cool and safe to touch during operation.

Precise Temperature Control

Built in thermostat allows our heater to be set to the precise temperature required for your application.

Reduced Installation Time

Save time and money when installing or moving the unit with our UL listed quick connects.

Compact Design

Wide range of heat options from 200W to 1200W all housed in the same compact housing.

Integrated Fan

Compact fan moves air across the heater elements to provide quick and efficient heating of the enclosure.

UL Certified

Heaters are UL Recognized to NITW2 and NITW8 standards allowing for easy integration into UL 508A panels.

PTC Heater Technology

Uses a self regulating heating element designed to prevent overheating and safe operation within your application.

FLH-TF

FAN HEATER WITH
THERMOSTAT

125 W - 800 W



Surface Mountable

Unit can be direct mounted within the enclosure without the need for DIN rails.

Precise Temperature Control

Easy to read built in thermostat allows our heater to be set without tools to the precise temperature required.

Integrated Fan Switch

Allows circulating fan to run continuous or only when the unit is actively heating.

Best Temperature Guaranteed

Used predominantly for the avoidance of excessively low temperatures or excessively high humidity in the control cabinet.

Standard Performances

Standard performance ratings from 125 to 800 Watts ensure that the units will be compatible with common heater requirements.

UL Certified

Heaters are UL Recognized to NITW2 and NITW8 standards allowing for easy integration into UL 508A panels.

The PFH-T Series Compact Fan Heaters with thermostat feature our **new touch safe design**. Ideal for maintaining precise temperatures required for the proper function of electronics, while also protecting equipment from damaging condensation caused by changes in temperature or humidity. **Available in 6 models.**

PFH-T Series (200 - 1200 W) Compact Fan Heaters

Model Number	Part Number	Voltage (VAC)	Heating performance (W)*	Frequency (Hz)	Power Consumption (W)	Airflow Volume CFM (m3/h)	Starting Current (A)	Width in (mm)	Depth in (mm)	Height in (mm)	Weight (kg)
PFH-T 200	17020715034	115	200	60	215	30 (50)	9	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
	17020710034	230	200	50/60	215	30 (50)	9	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
PFH-T 400	17040715034	115	400	60	415	30 (50)	15	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
	17040710034	230	400	50/60	415	30 (50)	15	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
PFH-T 650	7065715034	115	650	60	665	30 (50)	20	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
	17065710034	230	650	50/60	665	30 (50)	20	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
PFH-T 800	17080715034	115	800	60	815	30 (50)	31	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
	17080710034	230	800	50/60	815	30 (50)	31	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
PFH-T 1000	17099715034	115	1000	60	1015	47 (80)	25	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
	17099710034	230	1000	50/60	1015	47 (80)	25	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
PFH-T 1200	17099810034	230	1200	50/60	1215	47 (80)	31	3.46 (88)	5.47 (139)	5.59 (142)	1.68 (.76)
Design	Housing: ABS high temperature plastic										

FLH-TF Series (125 - 800 W) Fan Heaters with Thermostat

FLH-TF 125	17012515407	115	125	60	140	16 (27)	3	4 (102)	5.375 (137)	5.5 (140)	2.2 (1.0)
	17012510407	230	125	50/60	140	16 (27)	3	4 (102)	5.375 (137)	5.5 (140)	2.2 (1.0)
FLH-TF 200	17020015407	115	200	60	230	16 (27)	4.5	4 (102)	5.375 (137)	5.5 (140)	2.2 (1.0)
	17020010407	230	200	50/60	230	16 (27)	4.5	4 (102)	5.375 (137)	5.5 (140)	2.2 (1.0)
FLH-TF 400	17040015407	115	400	60	440	26 (44)	9	4 (102)	5.375 (137)	7.5 (191)	3.0 (1.4)
	17040010407	230	400	50/60	440	26 (44)	9	4 (102)	5.375 (137)	7.5 (191)	3.0 (1.4)
FLH-TF 800	17080015407	115	800	60	860	26 (44)	14	4 (102)	5.375 (137)	7.5 (191)	3.0 (1.4)
	170 8001 0407	230	800	50/60	860	26 (44)	14	4 (102)	5.375 (137)	7.5 (191)	3.0 (1.4)
Design	Housing: aluminum metal										

*Heating performance (Ta = +68 °F/+20 °C)
Approvals (see the Quick Selection Chart found at the beginning of this section)



For additional technical data, drawings and manuals.
www.pfannenbergusa.com

Available Models:

PFH-T
Compact Design
(NITW2, NITW8)



FLH-TF
Traditional Design
(NITW2, NITW8)



PRH-M | MINI RADIANT HEATERS

10 W - 30 W



The **PRH-M Mini-Radiant Heaters** are available in 3 models ranging from 10 W - 30 W. These small heaters are ideal for small outdoor enclosures, preventing condensate formation.

Easy Mounting Options
Unit can be connected to a standard DIN rail **without tools** using the included snap fastener.

Multiple Performance Ratings
The PRH-M is available in 3 different heating performance based models from 10 W to 30 W. Choose the total heat to be distributed based on your calculated requirements.

Ultra Compact Design
At just slightly over 1" wide and under 3" tall, this compact design easily installs into areas that have a limited installation space.

Durable Long-Lasting
With its rugged design, solid construction and no moving parts you can count on the PRH-M Heater to perform consistently over a long period of time.

Reduced Installation Time
The PRH-M Heater supports multiple voltage and includes a hard wired 12" (300 mm) electronic cord to easily install within the electrical enclosure.

UL Certified
Heaters are UL Recognized to NITW2 standards allowing for easy integration into UL 508A panels.

FLH | RADIANT & FAN HEATERS

30 W - 400 W



The **FLH Heaters** are available as a radiant heater or as a forced air heater for larger wattages. These heaters are designed to protect electronics from low temperatures and moisture caused by high humidity or rapid temperature changes.

Easy Mounting Options
Unit can be connected to a standard DIN rail **without tools** using the included snap fastener.

Heat Distribution
Our larger FLH 250 and FLH 400 Heaters include a fan to help circulate the heat in larger enclosures, ensuring quick and even distribution.

Durable Long-Lasting
With its rugged design and solid construction you can count on the FLH Heaters to perform consistently over a long period of time.

Reduced Installation Time
Save time and money when installing or moving the unit with our UL listed quick connects.

UL Certified
Heaters are UL Recognized allowing for integration into UL 508A panels.

PRH-M Series (10 - 30 W) Mini Radiant (PTC) Heaters

Model Number	Part Number	Voltage (VAC)	Heating performance (W)*	Frequency (Hz)	Power Consumption (W)	Starting Current (A)	Width in (mm)	Depth in (mm)	Height in (mm)	Weight lb (kg)
PRH 010-M	17000105317	110-250	10	50/60	10	1.0	1.16 (29.5)	1.77 (45)	2.95 (75)	.19 (.09)
PRH 020-M	17000205317	110-250	20	50/60	20	1.1	1.16 (29.5)	1.77 (45)	2.95 (75)	.26 (.12)
PRH 030-M	17000305317	110-250	30	50/60	30	1.2	1.16 (29.5)	1.77 (45)	2.95 (75)	.26 (12)
Design	Black anodized Aluminum									

FLH Series (10 - 150 W) Radiant Heaters - With extruded aluminum body

FLH 030W	17003005007	110-250	30	50/60	30	1.2	2.76 (70)	1.97 (50)	3.94 (100)	.55 (.25)
FLH 045W	17004505007	110-250	45	50/60	45	1.8	2.76 (70)	1.97 (50)	3.94 (100)	.55 (.25)
FLH 060W	17006005007	110-250	60	50/60	60	2.5	2.76 (70)	1.97 (50)	6.89 (175)	.99 (.45)
FLH 075W	17007505007	110-250	75	50/60	75	4.5	2.76 (70)	1.97 (50)	6.89 (175)	1.12 (.51)
FLH 100W	17010005007	110-250	100	50/60	100	5.0	2.76 (70)	1.97 (50)	6.89 (175)	1.12 (.51)
FLH 150W	17015005007	110-250	150	50/60	150	7.5	2.76 (70)	1.97 (50)	9.84 (250)	1.7 (.77)

FLH Series (250 - 400 W) Fan Heaters - With extruded aluminum body

FLH 250	17025015007	115	250	60	260	2.2	3.35 (85)	4.09 (104)	7.34 (186.5)	2.29 (1.04)
	17025010007	230	250	50/60	260	1.1	3.35 (85)	4.09 (104)	7.34 (186.5)	2.29 (1.04)
FLH 400	17040015007	115	400	60	410	3.6	3.35 (85)	4.09 (104)	8.92 (226.5)	2.65 (1.20)
	17040010007	230	400	50/60	410	1.8	3.35 (85)	4.09 (104)	8.92 (226.5)	2.65 (1.20)
Design	Aluminum profile, brightly anodized									

*Heating performance (Ta = +68 °F/+20 °C)
Approvals (see the Quick Selection Chart found at the beginning of this section)

For additional technical data, drawings and manuals.
www.pfannenbergusa.com

Available Models:

PRH-M
Ultra Compact Design
(Integrated Cord)



FLH
Compact & Large Designs
(Quick Connects)



FLZ 510-530 | THERMOSTATS

The FLZ 510-530 Series Thermostats are available in 3 different models. The FLZ 510 comes with a change over contact, the FLZ 520 comes with a N.C contact and the FLZ 530 comes with a N.O. contact. These are designed to work with cabinet heaters and Filterfans® to control the internal cabinet temperature.

Ultra Compact Design
At just slightly over 1.5" wide and under 3" tall, this compact design easily installs into areas that have a limited installation space.

Durable Long-Lasting
With its rugged design and solid construction you can count on the FLZ Thermostat to perform consistently over a long period of time.

Easy Mounting Options
Unit can be connected to a standard DIN rail **without tools** using the included snap fastener.



Unique Temperature Control
In combination with control cabinet heaters, they control temperature inside the control cabinet.

Models come color coded, blue dial for cooling and red dial for heating control.

Energy Savings Solution
In combination with Filterfans® the FLZ Thermostat can control the operation of the fan, turning it off and on based on a set temperature. This provides an environmental balance through energy reduction.

UL Certified for 508A Panels
Thermostats are UL Recognized allowing for integration into UL 508A panels.



*Note: The size listed on this page is for the FLZ 510. Please see the chart on the opposite page for dimensions of our FLZ 520/530 Models.

FLZ 510-530 Series Thermostat

Model Number	Part Number RAL 7035 (Light Grey)	Setting Range °F / °C	Voltage (VAC) (DC)		Type of contact	Switching Temperature difference (K)	Switching point tolerance (K)	Width in (mm)	Depth in (mm)	Height in (mm)	Weight lb (kg)
FLZ 510	17103000000	0-60 °C	100-250	max. 30 W	changeover with spring contact	1² / 3	± 3	1.46 (37)	1.87 (47.5)	2.34 (59.5)	.16 (.07)
	17103000010	32-140 °F	100-250	max. 30 W	changeover with spring contact	1² / 3	± 3	1.46 (37)	1.87 (47.5)	2.34 (59.5)	.16 (.07)
FLZ 520	17111000000	0-60 °C	100-250	max. 30 W	N.C. with spring contact¹	<7	± 4	1.57 (40)	1.42 (36)	2.83 (72)	.11 (.05)
	17111000010	32-140 °F	100-250	max. 30 W	N.C. with spring contact¹	<7	± 4	1.57 (40)	1.42 (36)	2.83 (72)	.11 (.05)
FLZ 530	17121000000	0-60 °C	100-250	max. 30 W	N.O. with spring contact¹	<7	± 4	1.57 (40)	1.42 (36)	2.83 (72)	.11 (.05)
	17121000010	32-140 °F	100-250	max. 30 W	N.O. with spring contact¹	<7	± 4	1.57 (40)	1.42 (36)	2.83 (72)	.11 (.05)

Additional Data	FLZ 510	FLZ 520	FLZ 530				
Operating temperature range	-40 ... +176 (-40 ... +80)						°F (°C)
Connection	screw terminal for cable cross-section 0.5 to 2.5 mm²						
Suitable for the operation of :	fan and heater		heater	fan			
Type of mounting	snap fastening for 35mm profile bars according to EN 60715						

¹N.C. = normally closed / N.O. = normally open
²For 230 V AC operation only
Approvals (see the Quick Selection Chart found at the beginning of this section)

For additional technical data, drawings and templates.
www.pfannenberguna.com

Schematics		
FLZ 510 1K	FLZ 520 N.C.	FLZ 530 N.O.

Available Models:

FLZ 510-530
Thermostats
(0-60 °C or 32-140 °F)



FLZ 541-543 | TWIN THERMOSTATS

The FLZ 541-543 Series Twin Thermostats are available in 3 different models. The FLZ 541 comes with N.C./N.O. contacts, the FLZ 542 comes with N.C./N.C. contacts and the FLZ 543 comes with N.O./N.O. contacts. Unlike a single thermostat with changeover contacts, connected devices can be switched to different temperature ranges to manage the internal cabinet temperature.

Ultra Compact Design
At slightly over 2" wide and just over 3" tall, this compact design easily installs into areas that have a limited installation space.

Durable Long-Lasting
With its rugged design and solid construction you can count on the FLZ Thermostat to perform consistently over a long period of time.

Easy Mounting Options
Unit can be connected to a standard DIN rail **without tools** using the included snap fastener.



Independent Controls
Control dials are color coded based on the model. The FLZ 541 comes with a red dial for controlling the heater and a blue dial for controlling the fan. The FLZ 542 comes with 2 red dials for controlling 2 heaters or a heater and alarm. The FLZ 543 comes with 2 blue dials for controlling 2 fans or a fan and alarm.

Energy Savings Solution
One unit can control two separate devices. When controlling a Filterfan® the FLZ Twin Thermostat can control the operation of the fan, turning it off and on based on a set temperature.

When also controlling a heater, the FLZ Twin Thermostat can turn the heater on and off based on enclosure temperature. This provides an environmental balance through energy reduction.

UL Certified for 508A Panels
Thermostats are UL Recognized allowing for integration into UL 508A panels.



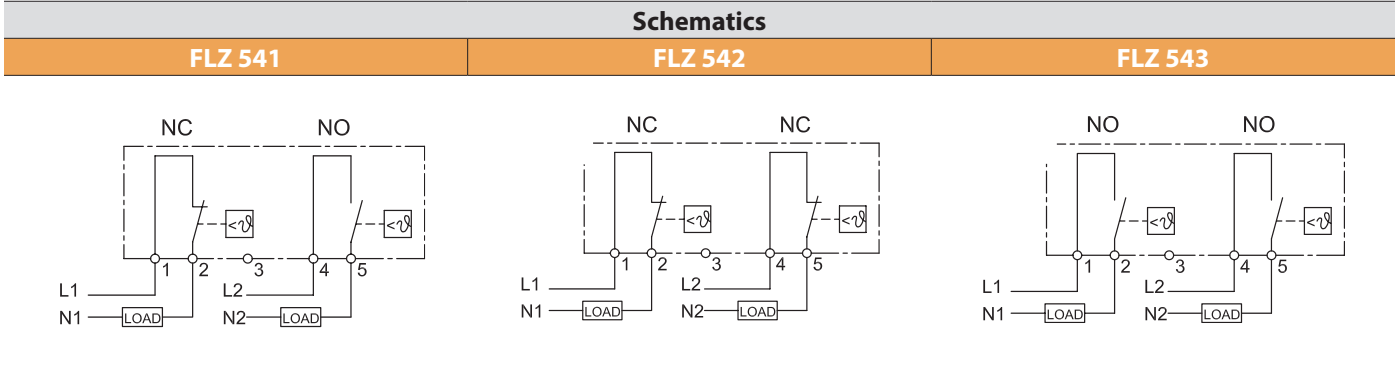
FLZ 541-543 Series Twin Thermostats

Model Number	Part Number RAL 7035 (Light Grey)	Setting Range °F / °C	Switching contact Voltage (VAC) (DC)		Type of contact	Switching Temperature difference (K)	Switching point tolerance (K)	Weight lb (kg)
FLZ 541	17141000000	0-60 °C	100-250	max. 30 W	N.C. / N.O. with spring contact ¹	<7	± 4	.21 (.09)
	17141000010	32-140 °F	100-250	max. 30 W	N.C. / N.O. with spring contact ¹	<7	± 4	.21 (.09)
FLZ 542	17142000000	0-60 °C	100-250	max. 30 W	N.C. / N.C. with spring contact ¹	<7	± 4	.21 (.09)
	17142000010	32-140 °F	100-250	max. 30 W	N.C. / N.C. with spring contact	<7	± 4	.21 (.09)
FLZ 543	17143000000	0-60 °C	100-250	max. 30 W	N.O. / N.O. with spring contact	<7	± 4	.21 (.09)
	17143000010	32-140 °F	100-250	max. 30 W	N.O. / N.O. with spring contact	<7	± 4	.21 (.09)

Additional Data	FLZ 541	FLZ 542	FLZ 543	
Operating temperature range	-40 ... +176 (-40 ... +80)			°F (°C)
Connection	screw terminal for cable cross-section 0.5 to 2.5 mm²			
Suitable for the operation of :	fan and heater	heater/alarm	fan/alarm	
Type of mounting	snap fastening for 35mm profile bars according to EN 60715			

¹N.C. = normally closed / N.O. = normally open
²For 230 V AC operation only
Approvals (see the Quick Selection Chart found at the beginning of this section)

For additional technical data, drawings and manuals.
www.pfannenbergusa.com



Available Models:

FLZ 541-543
Twin Thermostats
(0-60 °C or 32-140 °F)



FLZ 600 - 610 | HYGROSTATS

The FLZ 600-610 Series Hygrostat and combined Hygrostat/Thermostat models are ideal for controlling cabinet heaters and Filterfans® when a relative humidity is exceeded. Hygrostats help to keep the relative humidity within an enclosure above the dew point, preventing the condensation of water on electrical components and the corrosion of unprotected sheet metal.

Ultra Compact Design
At just slightly over 1.5" wide and under 3" tall, this compact design easily installs into areas that have a limited installation space.

Durable Long-Lasting
With its rugged design and solid construction you can count on the FLZ Hygrostats to perform consistently over a long period of time.

Easy Mounting Options
Unit can be connected to a standard DIN rail **without tools** using the included snap fastener.



Energy Savings Solution
The FLZ 600 Hygrostat can control the operation of a Filterfan® or heater, turning it on when a preset relative humidity is exceeded. This provides an environmental balance through energy reduction.

The FLZ 610 includes an additional control for operation of a Filterfan® or heater, turning it off and on based on a set temperature.

UL Certified for 508A Panels
Thermostats are UL Recognized allowing for integration into UL 508A panels.



*Note: The size listed on this page is for the FLZ 600. Please see the chart on the opposite page for dimensions of our FLZ 610 Model.

FLZ 600-610 Series Hygrostats / Hygrostats-Thermostats

Model Number	Part Number RAL 7035 (Light Grey)	Setting Range RH	Input voltage (VAC)	Max switching power (A)			Type of contact	Switching Temperature difference	Switching point tolerance (K)	Width in (mm)	Depth in (mm)	Height in (mm)	Weight lb (kg)
				115 VAC	230 VAC	DC							
FLZ 600	17207000000	40-90% R.H.	N/A	5 (.2) ²	2 (.2) ²	30 W	Mechanical hygrostat, changeover with spring contact	approx. 5%	± 4	1.46 (37)	1.85 (47)	2.36 (60)	.12 (.05)
FLZ 610	17218150000	40-90% R.H. / 32° - 140° F (0°C to + 60°C)	115	8 (.3) ²	8 (.3) ²	4 A	Electronic hygrostat-ther- mostat combo device, changeover/ relay	approx. 2 K ± 1 K / approx. 4% R.H. ± 1%	± 4	2.32 (59)	1.5 (38)	3.17 (80.5)	.18 (.08)
	17218101000	40-90% R.H. / 32° - 140° F (0°C to + 60°C)	230	8 (.3) ²	8 (.3) ²	4 A	Electronic hygrostat-ther- mostat combo device, changeover/ relay	approx. 2 K ± 1 K / approx. 4% R.H. ± 1%	± 4	2.32 (59)	1.5 (38)	3.17 (80.5)	.18 (.08)

Additional Data	FLZ 600	FLZ 610	
Operating temperature range	+30 ... +140 (0 ... +60)	-4 ... +140 (-20 ... +60)	°F (°C)
Connection	screw terminal for cable cross-section 0.5 to 2.5 mm²		
Suitable for the operation of :	fan and heater		
Type of mounting	snap fastening for 35mm profile bars according to EN 60715		

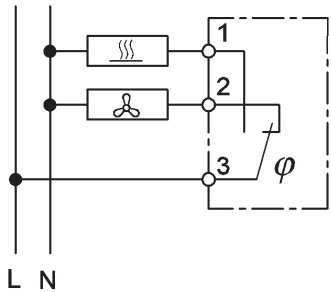
¹N.C. = normally closed / N.O. = normally open
²Max. switching power value in brackets (): inductive load at cos φ = 0.6
Approvals (see the Quick Selection Chart found at the beginning of this section)



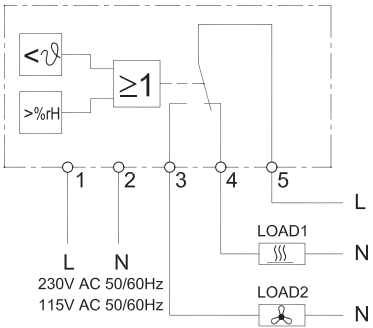
For additional technical data,
drawings and manuals.
www.pfannenbergusa.com

Schematics

FLZ 600



FLZ 610



Available Models:

FLZ 600
Mechanical Hygrostat
(0-60 °C or 32-140 °F)



FLZ 610
Electronic Hygrostat/
Thermostat Combo
(0-60 °C or 32-140 °F)



SIGNALING TECHNOLOGY

Rugged, Modern Signaling Devices for Improved Safety and Efficiency

Pfannenberger's visual and acoustic signaling devices satisfy numerous alarm, warning, and indication requirements, including: machinery operating status, process monitoring, system startup, and building or area evacuation due to fire, toxic gas leak, chemical spill, or intruder alert. With rugged construction and the ability to withstand severe environments (industrial, marine, mining, building, energy, transportation), Pfannenberger's signaling solutions are the only choice for improved safety and efficiency.

Alarm: Operation display of a machine informs the operator by means of a signaling device. These types of devices inform personnel who are nearby. These devices are not used for the indication of dangerous situations.

Warning: As a start-up signal for a machine. These types of devices warn about situations that could occur.

Indication: The evacuation alarm in case of a fire. Devices of this nature generate an alarm for emergency situations and have the highest priority.



PY X-S-05

5 Joules (44 cd) | 60 flashes per minute

PYRA SERIES
FLASHING LIGHTS

Connection

Simple electrical connection on the bottom of the casing.

SSM

Optional with Soft-Start-Module for reduction of starting current.

Safe and simple mounting

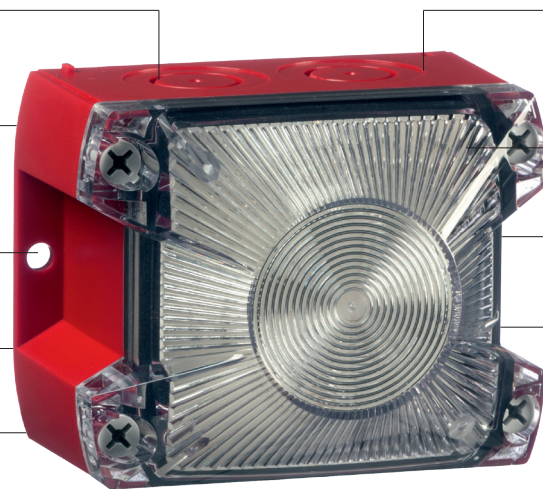
Installation options with external lugs or internal holes.

Panel mounting

Suitable for panel mounting.

IP 66

High protection system.



Colors

Housing colors: red | grey | white.
Lens colors: clear | white | yellow | amber | red | green | blue.

IK08

Impact-proof lens.

Modular design

Housing can be easily stacked side by side.

Approvals

EN 54-23 | VdS | UL | EAC
option: GL | MED.



PY X-M-05 | PY X-M-10 PY X-MA-05 | PY X-MA-10

5 Joules (44 cd) | 10 Joules (118 cd) | Adjustable flash rate, 100 dB (A)

PYRA SERIES
FLASHING LIGHTS /
FLASHING LIGHT SOUNDERS

4 different flash rates

Choice of four different flash rates via DIP switch (0.1 | 0.5 | 0.75 | 1 Hz).

IK08

Impact-proof lens.

Panel mounting

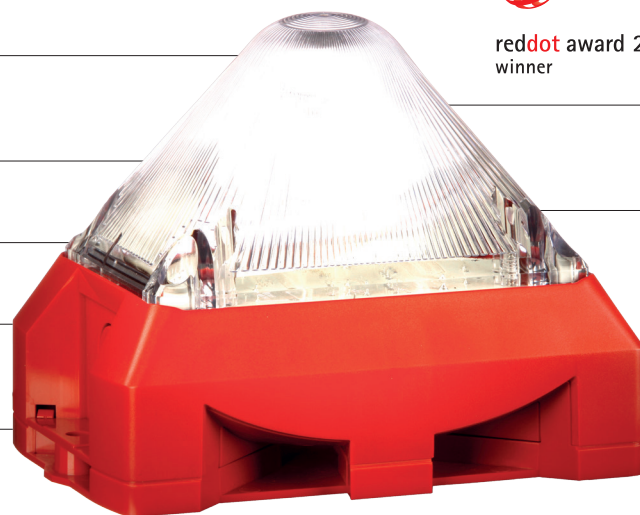
Suitable for panel mounting.

Safe and simple mounting

Installation options with external lugs or internal holes.

Approvals

EN 54-23 | VdS | UL | EAC
option: GL | MED.



red dot award 2015
winner

Multi-flashing light systems

Providing full synchronization on multi-flashing light systems.

Colors

Housing colors: red | grey | white.
Lens colors: clear | white | yellow | amber | red | green | blue.

IP 66

High protection system.

Options

Integrated inrush current limitation and under voltage detection.



PA 1-20

100 - 120 dB (A)

PATROL SERIES
SOUNDERS

Pfannenbergl
ELECTRO-TECHNOLOGY FOR INDUSTRY



red dot design award
winner 2013

Connection

A single terminal block in the base supports all wiring connections.

IK08

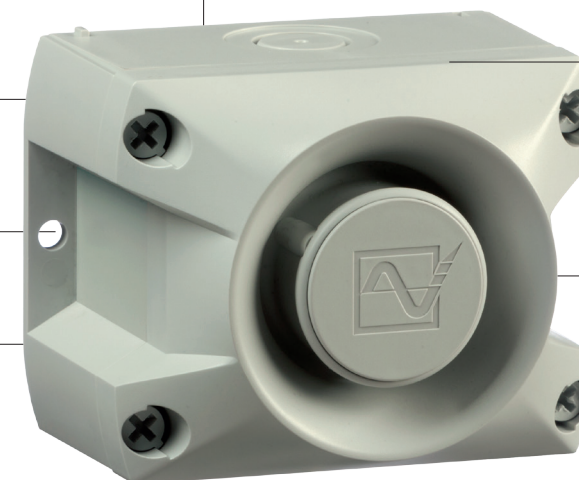
Impact-proof housing.

Safe and simple mounting

Internal and external mounting capabilities.

Mounting options

Panel mounting and surface mounting capabilities.



Colors

Housing colors: red | grey | white.

IP 66

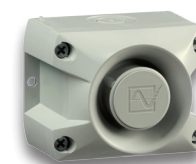
Fastener holes are outside the sealing area – IP rating cannot be compromised.

Approvals

EN54-3 | VdS | UL | EAC | RS
option: GL | MED | CNBOP.



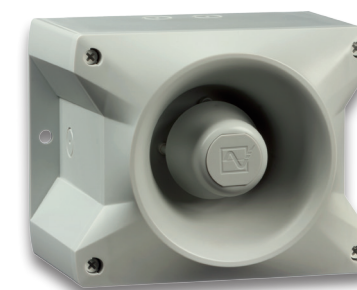
Available Models:



PA 1
100 dB (A)



PA 5
105 dB (A)



PA 10
110 dB (A)

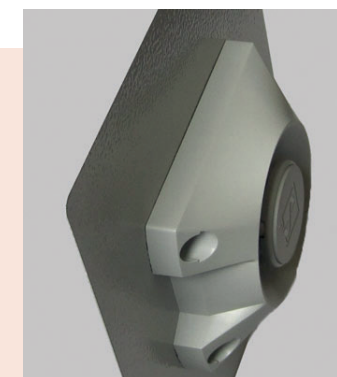


PA 20
120 dB (A)

DID YOU KNOW?

The PATROL PA 1 Sounder is available as a dedicated flush panel-mount version, which includes self-tapping panel screws and mating electrical connector (the back box is not included). Panel mount adaptation kits are available for all PATROL sounders.

Visit www.pfannenberglusa.com for additional information and part numbers.



PA X 1-05 / 20-15 | PATROL SERIES FLASHING SOUNDERS

5-15 Joules (44-129 cd) | 100-120 dB (A)

Connection

1-person assembly in rooms with high ceilings. Automatic contact of top part to bottom part when assembling.

Safe and simple mounting

Internal and external mounting capabilities.

IK08

Impact-proof.

Mounting options

Panel mounting and surface mounting capabilities.



Colors

Housing colors: red | grey | white.
Lens colors: clear | white | yellow | amber | red | green | blue.

IP 66

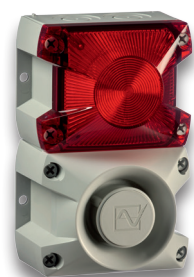
Fastener holes are outside the sealing area – IP rating cannot be compromised.

Economical

All screw terminal clamps are redundant to support daisy-chaining of multiple sounders.



Available Models:



PA X 1-05
5 Joules (44 cd)
100 dB (A)



PA X 5-05
5 Joules (47 cd)
105 dB (A)



PA X 10-10
10 Joules (129 cd)
110 dB (A)



PA X 20-15
15 Joules (190 cd)
120 dB (A)

BR 35 | SIGNAL TOWERS

Ø 35 mm | 3 W | 4 W

Visual

The light is amplified by the internal prisms of the impact-proof, heat-resistant and dust-proof polycarbonate lens and can be easily identified from all sides.

Modular design

Modular design with 6 different color elements and 4 mounting methods offers endless combination possibilities.

Mounting methods

Stand mounting | plinth mounting | tube mounting | panel mounting.

Applications

For use in electronic production, in laboratories, in medical technology and in all other indoor applications.



6 lens colors

Clear | yellow | amber | red | green | blue.

IP 54

High protection system.

Design

Appealing design with a diameter of just 35 mm.

Connection

Connecting terminals;
single wire: 1.5 mm²,
fine wire: 0.14 - 1.5 mm².

BR 50 | SIGNAL TOWERS

Ø 54 mm | 5 W | 85 dB (A)

Visual

The light is amplified by the internal prisms of the impact-proof, heat-resistant and dust-proof polycarbonate lens and can be easily identified from all sides.

Modules

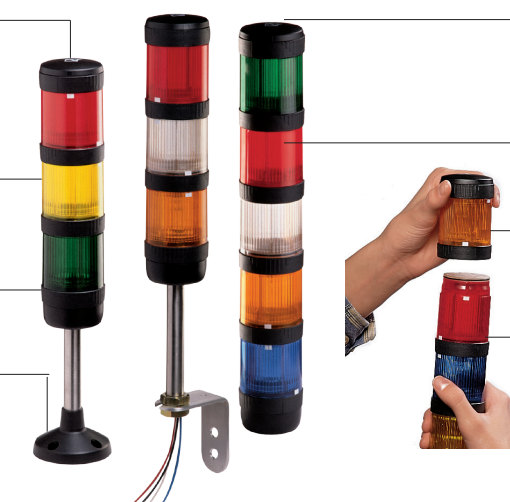
Continuous light | blinking light (1.5 Hz) | flashing light | sounder module 85 dB (A).

Mounting methods

Mounting stand | tube mounting | direct mounting.

Applications

Modular design with sturdy housing for all indoor and outdoor applications in tough conditions.



IP 54

High protection system (optionally IP 65).

6 lens colors

Clear | yellow | amber | red | green | blue.

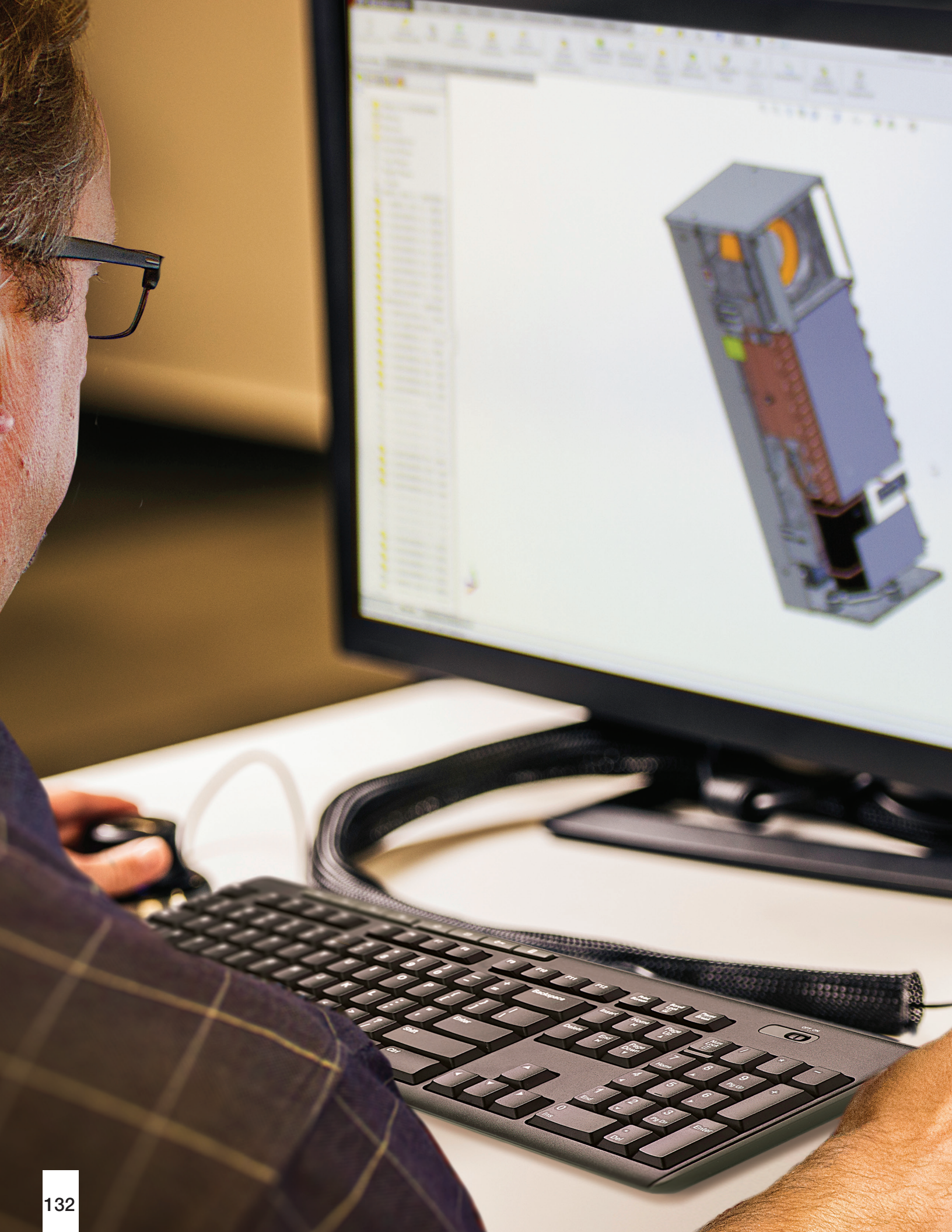
Easy handling

Flexible building kit system guarantees easy handling.

Variable

Up to 5 modules with 6 lens colors can be combined as desired by simply plugging together, even retrospectively.





ENGINEERED SOLUTIONS

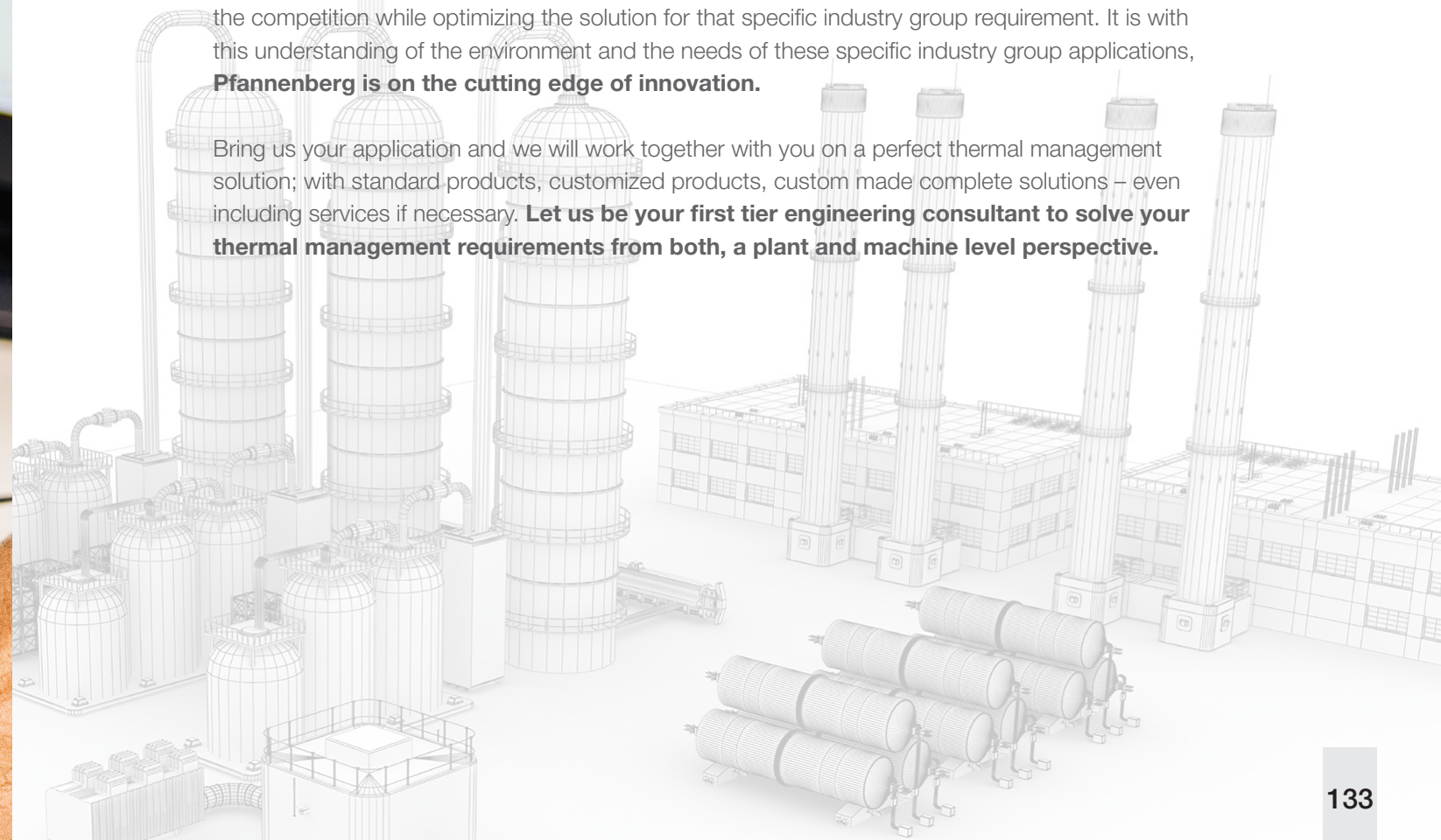
Application Specific Product & System Development

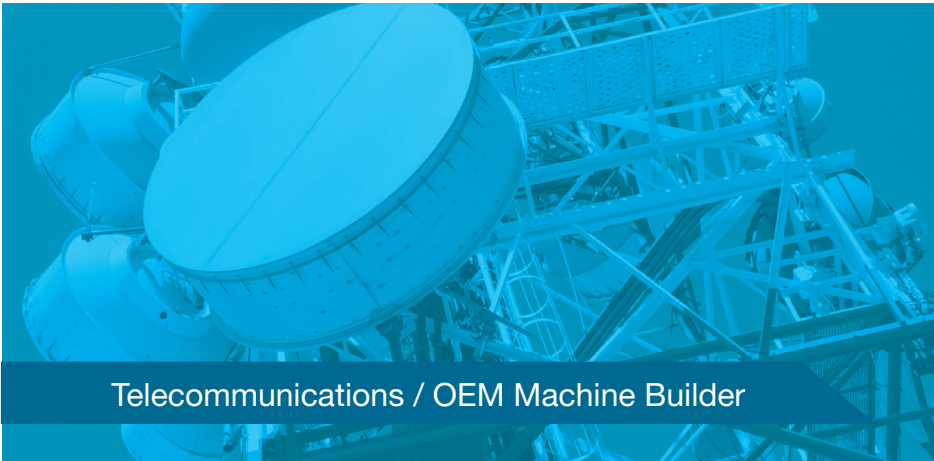
Pfannenberger understands that standard products don't always meet the need of every application. **We pride ourselves on having standard options for specific application needs.**

If already not available in our standard product portfolio, Pfannenberger can engineer products specific to a machine requirement in a specific application. Many of these applications are cutting edge.

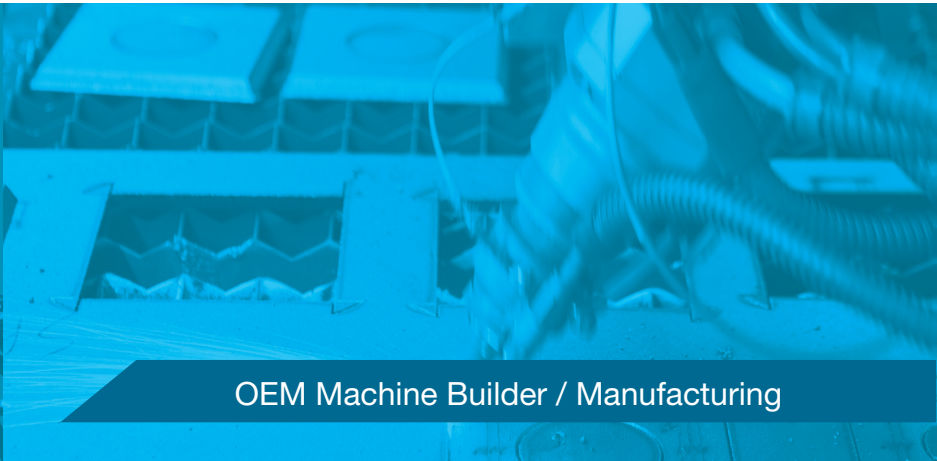
As the leading thermal management solutions company we can develop products quicker than the competition while optimizing the solution for that specific industry group requirement. It is with this understanding of the environment and the needs of these specific industry group applications, **Pfannenberger is on the cutting edge of innovation.**

Bring us your application and we will work together with you on a perfect thermal management solution; with standard products, customized products, custom made complete solutions – even including services if necessary. **Let us be your first tier engineering consultant to solve your thermal management requirements from both, a plant and machine level perspective.**

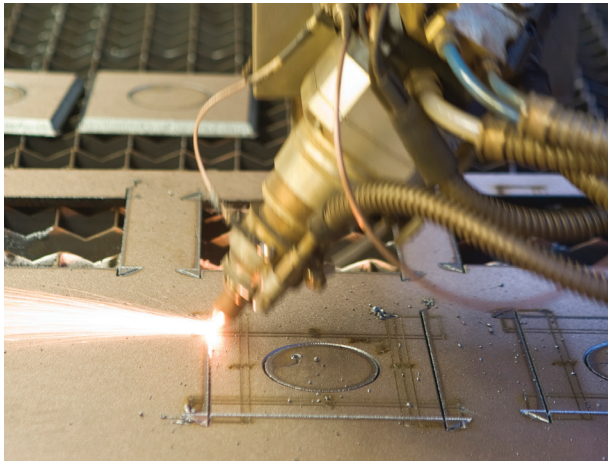




Telecommunications / OEM Machine Builder



OEM Machine Builder / Manufacturing



Customer Requirement

An OEM manufacturer and fitter of multi-function housings in the telecommunications industry was lacking the resources to provide its customer with an electrical enclosure prototype with active top-mounted ventilation. They needed a solution developed within in 4 weeks.

The Pfannenberg Solution

Our R&D team developed a precise specification and test plan with the client. After production of the prototype delivered by the expedited due date, it was tested to confirm that it meets the relevant requirements.

The full services to design this prototype were:

- Conception
- Development of specifications and test plans (layout)
- Design
- Flow simulation (CFD)
- Prototype construction
- Validation of prototypes with regard to relevant requirements
- Production of design and production documents



Customer Benefits

Following successful acceptance by the end customer, the design and manufacturing documents were passed on. Pfannenberg built the first 100 units, after which the client took over the manufacturing. The benefits are apparent; a benefit from the extensive expertise of our team of specialist without our customer having to temporarily expand their own R&D services. Our customer can focus on their core business without needing to invest in additional personnel and process development costs.

Customer Requirement

A technology leader in the manufacturing of laser marking systems developed a new controller for their laser marking systems. They needed a climate testing chamber to pre-test their system for conformity with the necessary design criteria. In particular, checking the IP protection system (IP 54) is crucial to ensure that it does not fail the tests later in the accredited (and costly) test laboratory.

The Pfannenberg Solution

To meet the customer's specific requirements we used the professional services of our own test laboratories, which we open to use for other companies.

We offered concept creation, preparation and execution of:

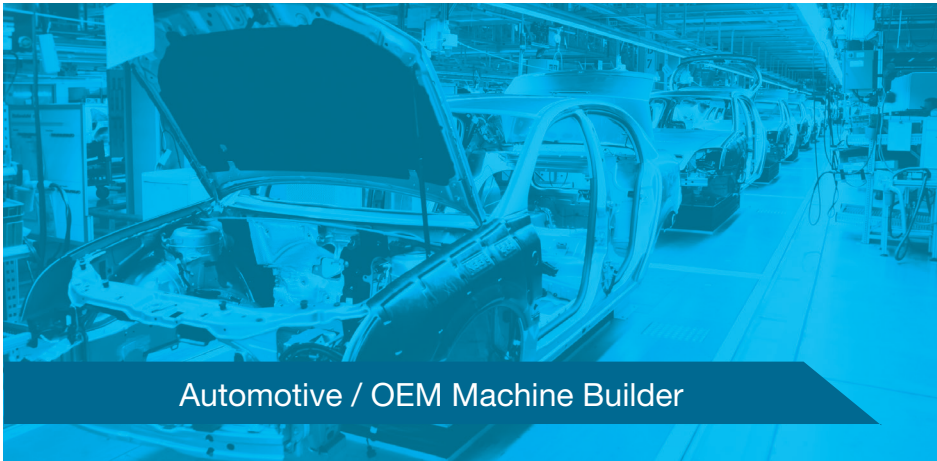
- Environmental simulations in the climatic chamber
- Thermographic images
- Protection system tests (IP protection)
- Transport and vibration tests
- Air quantity and light intensity measurements
- EMC tests
- Determination of noise emissions
- Flow simulation (CFD)

Customer Benefits

Together we developed a precise test plan. In accordance with the required norms and standards, tests were performed in our dust chamber (IP 5x), and with a spray arch (IP x4). Weak points were then analyzed and improved.

Our climate testing chambers helped the customer complete accredited laboratory tests ensuring a benchmark for a successful product release.





Automotive / OEM Machine Builder



OEM Machine Builder / Renewable Energy



SOLUTIONS

Customer Requirement

An Automotive OEM Machine Builder required a specific cooling solution that integrates into the electrical cabinets that house the controls for the their milling and turning equipment.

3 main requirements had to be met:

- A product with fittings that match their standard tubing.
- A way to eliminate the use of internal transformers in their machinery to enhance costs savings.
- A unit that was durable enough to withstand the handling during transit and installation.

The Pfannenberg Solution

Modified PWS 7000 series Air-to-Water Heat Exchangers were the best solution to fit the customer’s requirements.

We offered:

- Units that are assembled with fittings that connect to the customer’s specific tubing
- A customized 460 VAC unit that connects to the main power of the machine and can also be configured to 400 VAC for international use
- Modified internal piping that was changed from rigid copper to flexible plastic enhancing the durability of the unit
- The creation of a specific part number that reflects their required modifications allowing product to be sent and tracked to different manufacturing locations using a standard configuration

Customer Benefits

Integrating these features allowed our customer to offer an OEM Machine with enhanced costs saving to their end-use customer.



Customer Requirement

We had a specific request from an OEM Machine Builder. They were looking for a new enclosure heater to protect the electronics in their outdoor wind turbine systems. The product needed to be durable enough to withstand extreme weather conditions, easy to install and allowed for independent control of the fans and heaters within their system.

The Pfannenberg Solution

To meet the customer’s specific requirements we were able to modify the design of our standard PFH Compact Fan Heater.

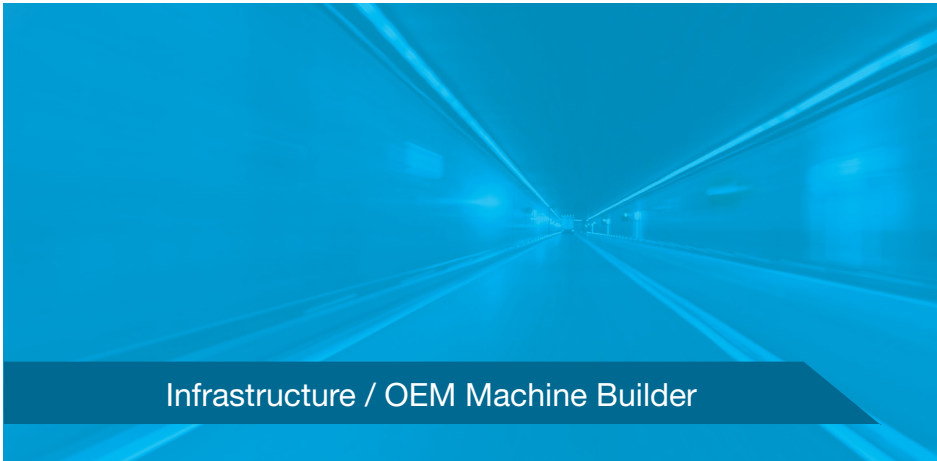
We engineered the following:

- We modified a standard PFH Compact Fan Heater to allow independent control of the heater element and circulating fan
- Created a unique part number to allow the customer to quickly order their specifically modified configuration

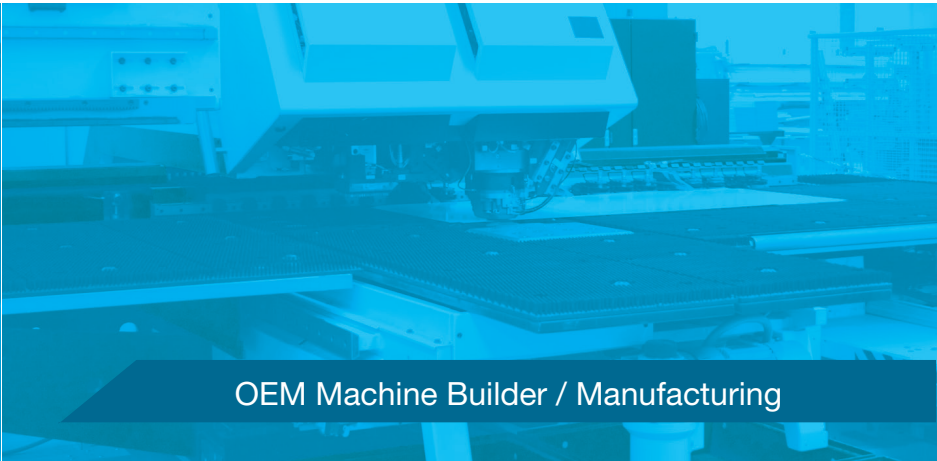
Customer Benefits

Our standard PFH Compact Fan Heater met most of the customer’s requirements. They were already durable and weather resistant, while also easy to install via DIN rail or direct mount. Through the modification of this standard product, we were able to develop a cost effective solution that incorporated independent control of the fans and heaters. The integration of the heater to their control systems allowed for control based on temperature or humidity.

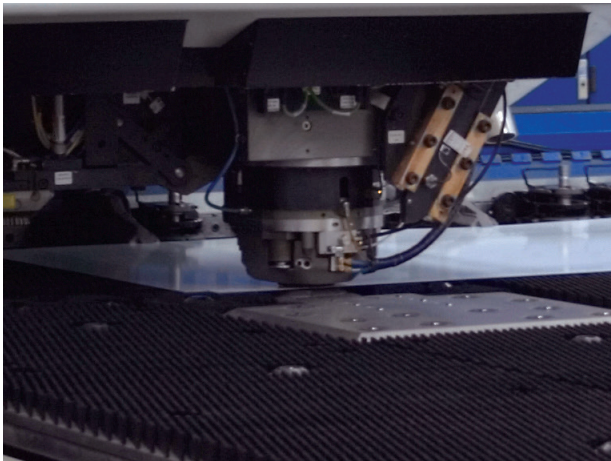




Infrastructure / OEM Machine Builder



OEM Machine Builder / Manufacturing



Customer Requirement

To provide a thermal management solution for railway tunnel enclosures in the Gotthard Tunnel, the world's longest tunnel. One of the greatest technical challenges on this project was to develop a product that would meet an IP65 rating when experiencing the high alternating pressure loads from the passing trains. In addition to the extreme alternating pressure loads, our cooling units also had to perform in conditions with extreme temperature differences and constant exposure to dust and moisture.

The Pfannenberg Solution

Pfannenberg worked closely with our customer to engineer a new line of cooling units, the DTGT 9041 and DTGT 9541 designed specifically for tunnel applications.

Our new cooling units were engineered with:

- A specially developed pressure body with integrated circuit
- Pfannenberg's new Generation of Controllers with Ethernet transmission protocol for central tunnel control
- An Intelligent control configuration for energy efficiency
- Uptime of the units are guaranteed to last for 10 years and defined maintenance work for short MTTR (mean time to repair)



Customer Benefits

Pfannenberg's DTGT 9041 & 9541 Cooling units are used in the 176 cross passages found throughout the Gotthard Tunnel. These units can withstand the alternating pressure loads of up to +/- 10 kPa, temperature differences ranging from -20 °C up to +40 °C and humidity levels of up to 100%. In addition, through remote monitoring, the current temperature of the electrical enclosure can be read and the hours of operation of the most important main components can be monitored. This is especially important to prevent unplanned failures and downtime by planning maintenance works in advance to guarantee a high level of system uptime.

Customer Requirement

We were approached by one of our customers to engineer an economical, integrated thermal management solution for their machines that use laser technology. The customer needed a solution that could integrate into their pre-existing water control system, didn't require control valves or thermostats and used less energy than standard cooling units.

The Pfannenberg Solution

Knowing that their machines used a separate liquid cooling system to cool the laser process, we were able to modify our standard PWS Air to Water Heat Exchanger for their system.

We engineered the following:

- Special mounting brackets were added to the outside cover allowing the units to be hung and mounted inside the control cabinet, supporting a clean, integrated cooling solution
- The valves and thermostats were removed
- The liquid cooling connections were moved from the standard bottom placement to the top of the units
- The unit was also redesigned to be configured in 460 VAC (and not 230 VAC anymore) to avoid the usage of transformers

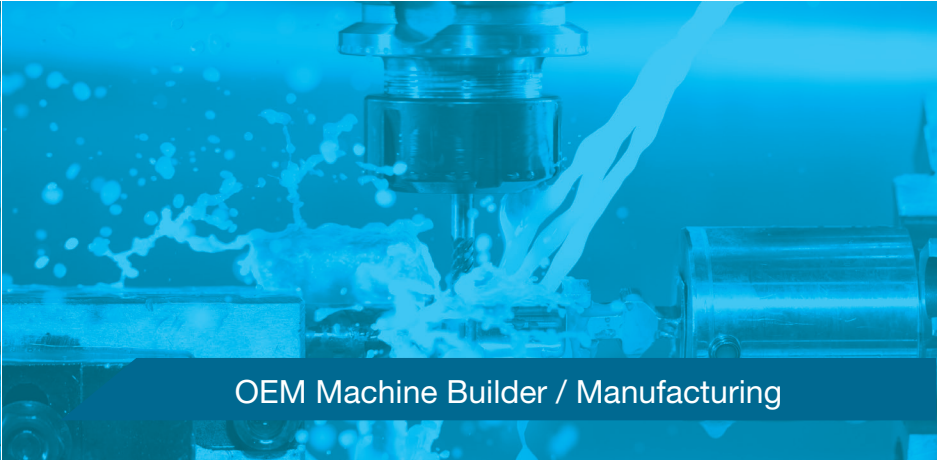
Customer Benefits

It was a natural choice to engineer a liquid cooled solution. Liquid cooling provides the most economical, maintenance free option for managing heat within an enclosure. Our PWS units are designed to guarantee full separation of water lines from airflow paths, allowing us to move the connections to the top of the unit. The customer plans to update all of their cooling units to air to water heat exchangers, where water is available.

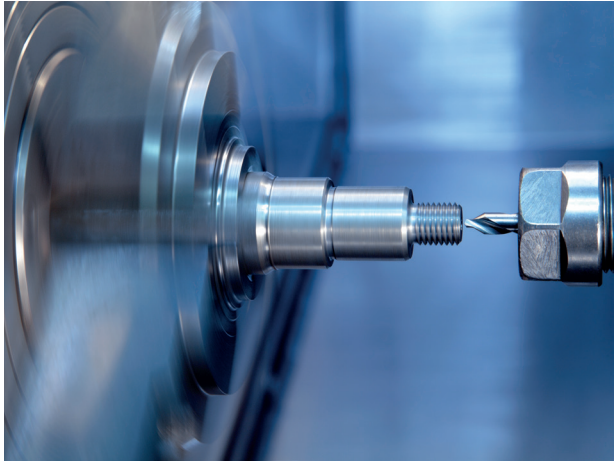




Food & Beverage / OEM Machine Builder



OEM Machine Builder / Manufacturing



SOLUTIONS

Customer Requirement

An OEM manufacturer of pasta making equipment had production process issues. Faulty pumps in the cooling system obstructed the flow of fresh water during pasta production. This lead to downtimes, repair and consequential costs. The customer needed a reliable cooled water source for the pasta extruders and assurance of consistently fault-free functionality.

The Pfannenberg Solution

Analysis conducted with the client identified the most suitable solution: **The use of hydraulic bypasses.** Our standard CC 6301 chillers exactly met the OEM's specific requirements.

Special features of the chillers are:

- Great variety of standard options, e.g. integrated hydraulic bypass, integrated flow switches, aluminum air filters etc.
- Separate cooling and hydraulic circuits
- Optimum long-term stability through the use of high-quality components
- Fluid cooling with water, water/glycol mixtures and low-viscosity oils
- Programmable control module enabling small hysteresis of the cooling medium temperature
- Steel housing with thick powder coating



Customer Benefits

A total of 14 CC 6301 chillers with integrated hydraulic bypass were installed. The robust stand-alone units are UL certified and guarantee maximum machine availability and maximum MTBF*. Standardized components and a sophisticated plug&play concept also minimize repair costs and downtimes.

*MTBF: Mean Time Between Failures

Customer Requirement

An OEM Milling component manufacturer which develops processing centers for the precision boring and milling of high-precision components needed critical thermal management for their machine's control electronics. The systems are designed using relatively tall electrical enclosures to minimize that installation space. This compact design fosters the development of heat pockets.

They needed a space-saving thermal management solution to keep the manufacturing footprint compact. To minimize the formation of heat pockets, the solution needed to promote very efficient air circulation. Another requirement was absolute protection against condensate and assurance of top-level machine availability - even under difficult environmental conditions. Thermal management with compact cooling units proved to be unreliable so far because of the problems with condensate.

The Pfannenberg Solution

Our revolutionary DTT series top-mounted cooling units met the requirement for maximum reliability, space savings design and 100% protection against condensate.

The DTT top-mounted cooling units provide unique, four-fold condensate protection:

- Zero sweat guarantee
- No overflow of condensate into the electrical enclosure
- Managed water droplet control
- No air hoses, which are otherwise at risk of condensation

Further benefits:

- High-volume air delivery via the integrated nozzles to accelerate cold air movement right down to the bottom of the cabinet
- Filter media for any area (contaminated ambient air)
- Controller with energy-saving mode to maximize energy-efficiency (optional feature)



Customer Benefits

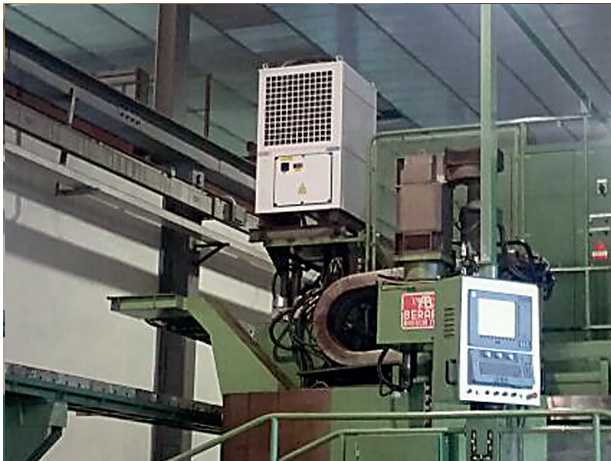
Switching to the DTT series top-mounted cooling units successfully allowed the OEM to provide a competitive design to their customers. The units are compatible with all makes of electrical enclosures and are available in 3 sizes and 6 performance levels. Because of its cUR approval and versions with 230V and 400V voltages, the milling processing centers can be used worldwide.



Manufacturing / OEM Machine Builder



End User / Infrastructure



SOLUTIONS

Customer Requirement

A world leading manufacturer of hydraulic components and systems needed a smart and cost-effective solution to expand the cooling of lubricating oil used for machining metal parts. Their current solution was configured with a single chiller and oil tank, the new requirement was to support the cooling of lubricants for 3 oil tanks (capacities of 50, 80 and 200 gallons) where one oil tank is already in place and connected to a chiller. For budget reasons, acquiring two new additional chillers was ruled out.

The Pfannenberg Solution

Taking budget restrictions into account and making maximum use of the on-site requirements, a customized, economical system solution was developed.

An EB 190 WT Chiller was sized and placed outside the building. Placing the unit outside provided a closer access point to the main water and kept any heat from the chiller away from the internal equipment. To accommodate the cooling of 3 oil tanks vs. the original single tank design, three maintenance free water/oil heat exchangers were added to the system, each used on one of the oil tanks and connected to the centralized chiller.

Special features of the system solution are:

- A robust EB 190 WT chiller which can also be located outside if necessary
- Three maintenance-free water/oil heat exchangers
- Maximum safety, energy and cost-efficiency
- Optimum long-term stability and reliability (maximum MTBF*)
- Unsurpassed ease of servicing (minimum MTTR**)



Customer Benefits

The company benefits from an individual solution which proves to be very economic both in terms of its acquisition and in its daily use. To increase cost-efficiency even more, the chiller used so far was integrated into another application in the factory.

*MTBF: Mean Time Between Failures **MTTR: Mean Time To Repair

Customer Requirement

A rail component manufacturer needed a solution to eliminate downtime caused from the overheating of their track drilling unit. The current system used 2 undersized chillers, unable to keep up with the cooling requirements, especially when the ambient temperatures in the plant rose due to the hot afternoon sun.

The Pfannenberg Solution

An analysis carried out on location with the customer revealed that the cooling capacity of the two chillers no longer corresponded with the current requirements. The cooling system needed to be redesigned.

Taking the temporarily intermittent high ambient temperatures in the factory into account, the choice fell on our high performance EB 90 chiller. This unit has an integrated control module which allows for precise temperature control of the cooling medium.

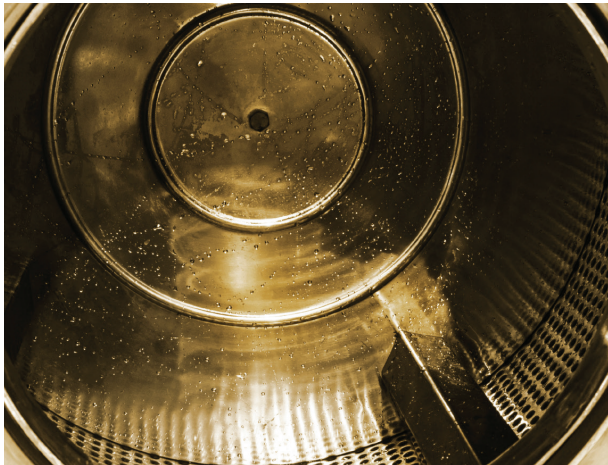
The solution excels due to:

- Separate cooling and hydraulic circuits
- Control module to program small hysteresis of the oil temperature
- Use at ambient temperatures of up to + 40 °C
- Sturdy steel housing with thick powder coating



Customer Benefits

As a result of our plant audit the customer was able to invest in a new solution that was tailor-made to meet their current needs instead of spending money on a temporary, expensive and insufficient repair of their old chiller system. The new solution ensures the desired machine uptime even during those days affected by the hot sun. A new maintenance contract was signed to support the optimum functionality of the equipment for the long term.



Infrastructure / OEM Machine Builder



End User / Wood Manufacturing



Customer Requirement

A German manufacturer setting up a industrial laundry system for an airport in the Middle East needed to cool the electronic components that controlled the laundry system. When the washing machine drums were opened, the humidity increased and the ambient air within the facility reached temperatures of 140 °F (60 °C). A solution was needed that would cool the electronics without the introduction of additional exhaust heat back into the ambient air outside of the cabinets.

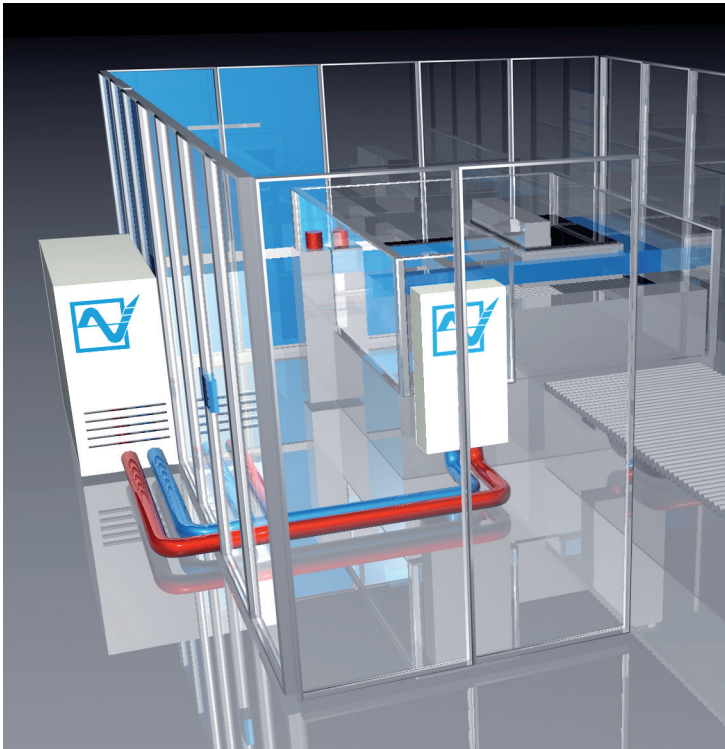
The Pfannenberg Solution

The ideal solution for this project was to place an EB 60 WT Chiller outside of the laundry system area. Chilled water was then piped into the laundry area into our high temperature resistant PWS Air/Water Heat Exchangers.

The benefit is that the air/water heat exchangers work independently regardless of the ambient air quality, plus they do not generate additional exhaust heat back into the area. We used 3 air/water heat exchangers and a chiller to create a system that achieved the requirements that were specified.

Special features of the solution are:

- Maintenance-free air/water heat exchanger, PWS 6501 and PWS 6102 (+1 °C to +70 °C, protection system up to IP 65)
- Chiller, EB 60 WT with the option for an outside location (–20 °C to +40 °C, protection system IP 54)
- Maximum safety, energy and cost-efficiency
- Optimum long-term stability and reliability (maximum MTTF)
- Unsurpassed ease of servicing (minimum MTTR)



Customer Benefits

Placed outside of the laundry, a chiller suitable for outdoor installation supplies the air/water heat exchangers located in the laundry with chilled water and significantly increases machine availability because of the constant air supply temperature.

Customer Requirement

An end user turned to Pfannenberg for assistance with managing their enclosure temperatures in a particularly harsh environment. The company produce high-quality construction and insulation materials from wood fiber. Their current system was facing system failures and downtime due to severe soiling from wood dust and rust particles from diesel-powered fork lift trucks and heavy equipment. The current thermal management solution used conventional point-of-entry filters and top-mounted fans. We needed to redo their current cabinet system. The new system needed to be reliable despite severe air contamination from wood dust and exhaust gas, plus provide energy savings and service friendliness.

The Pfannenberg Solution

As a first step, all the switch cabinets were wet cleaned, both inside and outside. To rule out any repeat soiling, the top-mounted fan combination was replaced by partially recessed cooling units (DTI 6301 model).

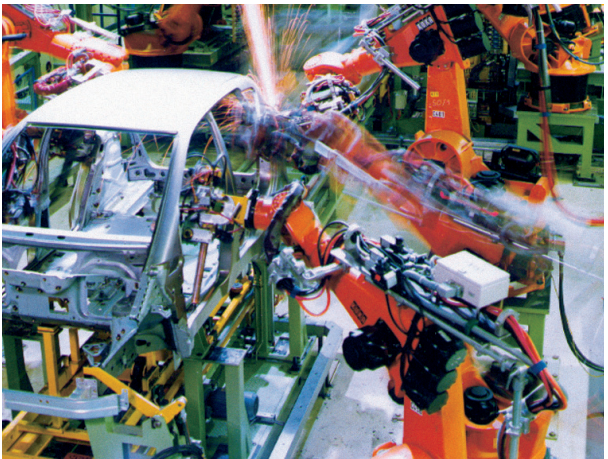
Special features of the cooling units are:

- Uniquely high energy-efficiency rating (EER)
- Significant energy savings / operating cost reduction
- Condenser with wide fin spacing for highly effective protection against contaminated ambient air
- Large distances between intake and exhaust vents (to eliminate hot spots).
- Perfect ease of servicing
- New service interface for easy retrieval of parameter settings / history (Pfannenberg Plant software necessary)
- Optional filter can be retrofitted in a few seconds
- Energy-saving mode in the Multi Controller integrated as standard



Customer Benefits

Use of the new DTI 6301 cooling units led to reliable system operation and to the highest possible amount of machine uptime. The environmental and cost balance sheets demonstrated considerable reductions with regards to energy costs and CO2 emissions, as well as reduced service requirements and repair times.



Customer Requirement

It's not uncommon for remote telecom enclosures to be located outdoors and need to withstand harsh environments. A telecom OEM approached Pfannenberg for an enclosure cooling solution for a project that was located in a harsh outdoor environment. A stainless steel unit normally would be used in this instance but we needed to find a way to reduce the effects of the constant sunshine and build up of heat.

The Pfannenberg Solution

A standard DTS Outdoor Rated Cooling Unit was chosen and painted in a customized white color to be directly integrated into their system without extra rework by the customer.

Our cooling units were engineered with:

- A specialized light color paint over the stainless steel
- A Maintenance-free design
- A UL Tested NEMA Type 4/4X seal against the enclosure
- Large distance between intake and exhaust vents for safe efficient circulation of air within the electrical enclosure safely eliminating hot spots

Customer Benefits

The units were supplied to the customer in a timely manner, satisfying their request. Due to their effectiveness and color matched design, they decided to make these products their standard for thermal management solutions.



Customer Requirement

An automotive OEM manufacturer needed a chiller to integrate with their OEM machines. The main requirement from the OEM was to cool two separate circuits of oil, each of which must be controlled separately. One circuit was used for cooling a spindle motor and the other circuit was used to cool a cutting process. Each circuit had a different cooling capacity.

The Pfannenberg Solution

Knowing that the unit had to physically fit onto the footprint of an existing design, we were able to modify one of our standard chillers for this system.

We Offered:

- Two separate oil to refrigerant heat exchangers
- Two controllers to separately monitor both oil circuits
- Two separate pumps, one for each circuit
- The chiller needed to be mounted specifically above the oil tank. This space constraint required us to use an immersion style pump, protruded through the base of the chiller to pump oil from the tank below

Customer Benefits

All of the customer's initial requirements were met with this custom modified air-cooled chiller. When the customer also needed a water-cooled version of this same product, our previous experience allowed our engineering team to efficiently create another unit using this different method of cooling.





Customer Requirement

An OEM machine builder in the Marine industry needed a thermal management solution that was NEMA Type 4/4X rated, but also resistant to highly corrosive salt spray (fog). In an industry that encounters very harsh environments, it is crucial to be able to have a product that will be able to withstand such environments.

The Pfannenbergl Solution

To meet the customer's specific requirements we provided our PWS Air to Water Heat Exchangers with the 316 Stainless Steel option.

We offered a unit:

- Which is very resistant to corrosion and oxidation (316 Stainless Steel) compared to the 304 Stainless Steel
- That can be configured with a different heat exchanger when salt water is used for the cooling supply water
- With an easy to mount seal, no elaborate reworking of the mounting cut-out
- With an integrated thermostat and solenoid valve for temperature control

Customer Benefits

The customer is satisfied with these units which are highly resistant to marine environment and to reduce downtime and maintenance costs.



Customer Requirement

An OEM machine builder turned to Pfannenbergl for assistance with a project that required a chiller to fit in a smaller scale Ferrator water treatment system. Initially, a CC 6301 packaged chiller was used successfully; however, new design criteria required further miniaturization and the standard packaged chiller would no longer fit.

The Pfannenbergl Solution

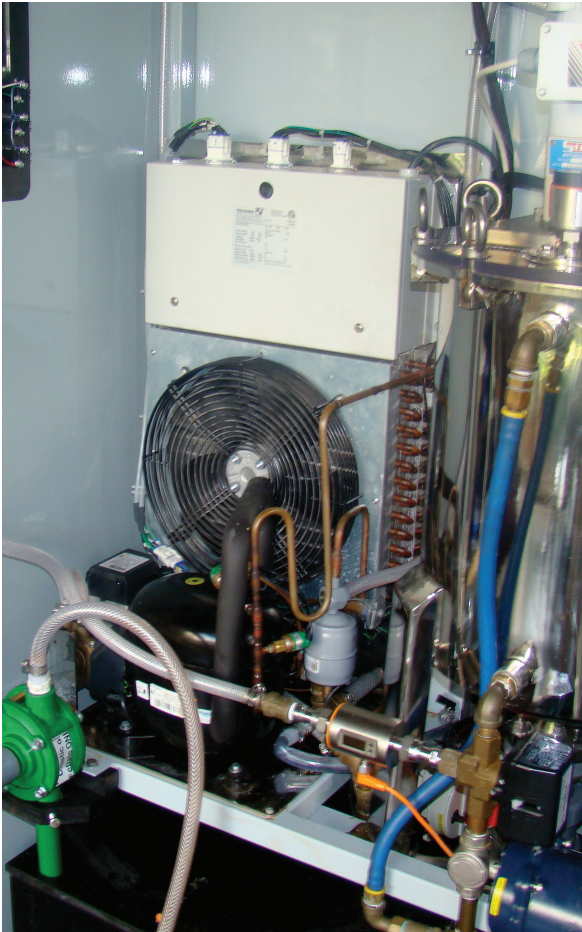
We decided to modify a standard CC Chiller for the customer to be able to manipulate their program to cool multiple processes. A CC Chiller was built on a special "L" frame bracket designed to fit into the cavity of their machine.

The unit was modified to include:

- Rugged and durable design to withstand conditions found in 3rd world countries where servicing the product would be difficult
- An open framed chiller design based on a standard CC 6301 Chiller
- A smaller reconfigured unit, sized to fit into their specific enclosure footprint

Customer Benefits

The small scale Ferrator is targeted for use in third world areas for the treatment of human wastewater and drinking water. Here, the efficiency of the self-contained system will permit water purification in remote areas in which there are no sewer systems, water distribution systems, or central water treatment facilities. The small size of the Ferrator permits it to be readily transported to such remote areas and even be used as a portable device for use at multiple locations.





Pharmaceutical / System Integrator



End User/ Food & Beverage



Customer Requirement

A system integrator contacted Pfannenberg looking for a thermal management solution for their customer's plant expansion project. The original design called for building a control panel with supported thermal management for a pharmaceutical application. The challenge was that this system would be located in a Class I, Div II environment, meaning the enclosure and components had to be explosion proof. To remain competitive in price, the system integrator needed an alternate solution to an explosion proof AC unit.

The Pfannenberg Solution

Our engineering team worked closely with the system integrator to develop a solution. The pharmaceutical plant did have water available (60°F at 7gpm flow) and there were no size constraints. Our solution was a customized PWS Air/Water Heat Exchanger.

The solution included:

- Increasing the overall envelope of the panel
- Mounting a customized PWS Air to Water Heat Exchanger directly inside the panel
- The enclosure remained explosion proof because everything remained inside the cabinet

Customer Benefits

Installing the thermal management product inside the enclosure meant reduced installation and maintenance costs for the customer. In addition the end user also saves money as their available water is used to cool the enclosures. The Air to Water Heat Exchanger provides sustainable efficiency and reliable performance in harsh environments.



Customer Requirement

Pfannenberg worked with a Bakery end user to develop a cooling solution for their control cabinets. Most of the OEM equipment installed in the bakery called for air conditioners to cool the drives, PLCs and additional electronics. Most times ACs can be a convenient and effective method for cooling electronics, except when located in dusty, humid areas within the plant. These AC units failed regularly and had to be replaced, this was not a sustainable solution. They had constant issues with clogging coils and their panels overheating. Once a panel overheated they had to either: not operate the machine, or operate the cabinet with the doors open. This would let all the contaminants that were hurting the AC units into the cabinet, damaging the drives and other components.

The Pfannenberg Solution

To use the chilled Glycol that was already present for other machine processes to provide the cooled liquid source for our PWS Air/Water Heat Exchangers.

The solution included:

- A reliable cooling solution designed for harsh environments
- Reduced maintenance. Once installed the units only have just one moving part, so regular maintenance is not necessary
- Eliminating equipment failures, means greater uptime
- Reduced energy costs with the PWS units
- UL Tested NEMA Type 4/4X - washdown

Customer Benefits

Pfannenberg's PWS Series Air/Water Heat Exchanger were the precise solution for the problems our customer experienced. Incorporating Air/ Water Heat Exchangers improved performance, reduced maintenance, was energy efficient, and prevented unplanned repairs.





INDUSTRY GROUPS

Always the Right Solution

Industries on the move need partners that can grow with their needs, we are that partner. Our invention of the Filterfan® emerged through close cooperation and listening to our customers. Today, we ourselves are a world leading company and support the needs of clients on all continents. Our roles include consultants, problem solvers and pioneers in the following areas:

Automotive - Pfannenberger manufactures thermal management, liquid cooling and signaling solutions for the largest automotive manufacturers and their suppliers worldwide. We ensure a high level of availability, protection and efficiency along the entire value-added chain.

Energy - Our thermal management and signaling solutions for wind power turbines are used by manufacturers and their suppliers throughout the world. Pfannenberger also provides innovative solutions to support the construction of intelligent power networks (smart grids).

Food & Beverage - We offer a broad range of products and solutions for filling and packaging machines, process lines, brewing technology and baking and meat-processing machines just to name a few.

Infrastructure - We provide a broad range of integrated products and solutions for infrastructure applications including the construction sector (buildings, roads, tunnels), transportation sector (airports, shipping and cranes) and water and wastewater industries.

... and many more

Automotive Industry: Full throttle for production dependability.

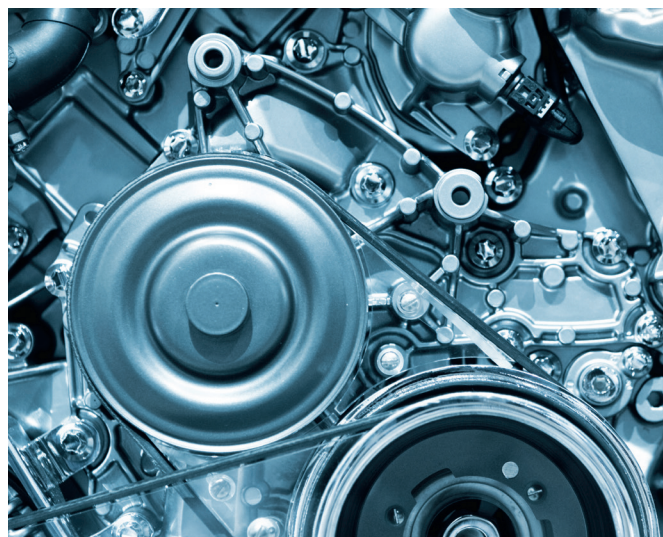
The performance expectations from today's production lines are higher than ever. Longer life-cycles mean higher requirements for machine and component uptime, at the same costs and even greater energy efficiencies. We support manufacturers and suppliers along the whole supply chain from the press plant to quality control.

Solutions shaken by nothing.

Manufacturing facilities that produce engines, gearboxes, axles, or shafts are exposed to extreme conditions. Knowing this we've developed components which are designed and constructed for these harsh environments. Two products commonly used in these environments are air/water heat exchangers and our chillers.

Our air/water heat exchangers protect the control units of machines from overheating at high ambient temperatures and our compact chillers provide the system used for the cooling of spindles, engines, hydraulics and lubricants.

In addition to our thermal management and liquid cooling products our signaling products are also specified. All production lines are accompanied by signaling devices which display machine statuses and alert operators about danger. In large plants, this is achieved by our all-round flashing lights from the PMF series and our DS series sounders, which with 110 dB (A), assert themselves even against the loudest milling machines.



Complementary components

Our air/water heat exchangers are the first choice for reliable thermal management in the most severe ambient environments. They have a maintenance free design made out of a rugged steel housing, resistant to corrosion, heat and dirt.



PWS Air/Water Heat Exchanger

Chiller CC Series

Air/water heat exchanger

- Cooling independent of the ambient temperature.
- Maintenance free, ideal for operation in harsh environments.
- Optional water connection from above, space-saving footprint on compact machine tools.

Chiller CC series

- Compact design, low space requirement in small or narrow production halls.
- Large tank openings for quick maintenance.
- Steel housing with thick powder coating for tough industrial environments.

Customized for the manufacturing industry.

Doors and bumpers are shaped by large presses, robots carry out delicate painting and mounting work – as different as the machines, the process and the respective environments are, so different are the thermal management solutions to prevent downtime.

More operating space.

In production, every square meter of the facility is valuable space. Our DTT top mounted cooling units are perfect for facilities where space is limited and walkways need to be clear. Thanks to patented condensate management, the DTT series guarantees 100% protection against condensation and ensures protection of electrical technology.



Top-mounted cooling unit DTT series

Air/Air Heat Exchanger

Top-mounted cooling unit DTT series

- Minimum space required.
- Walkways are kept clear.
- 100% condensate protection.

Air/air heat exchanger

- Three performance classes from 20 W/°C to 100 W/°C in three installation sizes.
- Long airflow for secure circulation of the electrical enclosures.
- Integrated thermostat to regulate temperatures.

The proper solution to every requirement. Assembly and conveyor lines are typically set up in an environment which offers proper airflow. If the use of Filterfans® is not an option, our PAI Air/Air Heat Exchangers would be the proper solution. In order to react to the spatial demands, these devices allow side mounting or partially recessed mounting.

Protecting employees in areas, such as where the presses are located, SIL/PL complaint signaling devices are the solution. When the air is contaminated with solvents, the ATEX models are appropriate. In final inspection instances, our heaters protect the control units against the formation of condensation in the units.



Full line solutions for the food and beverage industry.

Technology used in food production faces many challenges. With specific cooling solutions we ensure dependable quality and durable machines in highly dynamic processes with rapid cycle times – from raw material processing through manufacturing and quality control to packaging.

Maximum performance and energy-efficiency.

Whether in a grain mill or a beverage bottling line – high-tech production lines often run in continuous operation. Our cooling units and Filterfans® provide the ideal solution for the cooling of electronic components and keeping particles (dust, flour, water) from entering enclosures. They combine maximum performance with unmatched energy and cost efficiency, and ensure continuing operation.



Built for harsh environments.

Acidic vapors occur when canning fruit and vegetables, flammable hydrogen sulfide occurs during meat processing, flour and condensation are often present in bakeries – sensitive control technology needs to be protected from many environmental conditions.

With IP 56 protection, our cooling units satisfy the toughest environments. They are available with a corrosion protected hood in brushed stainless steel with epoxy-coated copper pipes and condensers; they offer reliable protection against alkaline solutions and acids. As a high-temperature model, they are also suitable for use in hot baking environments with temperatures ranging up to 140 °F (60 °C).

In the meat processing industry, compact and robust chillers are responsible for cooling mixing chambers. They provide a space-saving stand-alone solution for the cold water supply.

Customized solutions.

In predominantly demanding testing areas, our maintenance-free air/water heat exchangers and EB series chillers are both cost-effective system solutions which operate independently of the ambient air.

Patented designs for more reliable operation.

The high performance of our products comes from years of research and design experience. For example a series of patents for our 4th generation Filterfans® and top-mounted DTT series cooling units emphasize our quality advantage, giving our customers extra protection of their electronics.



“Trust the Original”: Inventor of the Filterfans®.

A variety of different conveyor belts use small electrical enclosures cooled by ambient air. Here, our Filterfans® provide a safe and economic solution.

With flow-optimized fins and rotor blades, they enable maximum airflow with minimum energy consumption. Thanks to their patented fluted filter mat, they achieve IP 55 protection and a 300 % longer product life, which reduces operating and maintenance costs.

Combined with a thermostat their efficiency is increased, operating only when active cooling is needed. Fitted with a weather-proof hood, they are also unaffected by high-pressure cleaners.

Top-mounted cooling units with 100% protection from condensate. Where space is restricted, the innovative top-mounted DTT series cooling units display their strengths. They fit all makes of electrical enclosures and feature a unique patented condensate management system, which totally protects the control electronics inside the electrical enclosures from condensate.

The units come in three sizes, 6 performance levels and with a stainless steel finish. Different optional filter media make them suitable for use in severely dust or aerosol contaminated environments.

The top-mounted DTT series cooling units provide an unmatched energy-efficiency level. Through their use of powerful, light components and an optional multi-controller, energy-saving switch mode.



Construction industry: Building safety throughout the world.

Modern towns and cities are multi-functional living and working spaces in which technical solutions allow everyday life to run smoothly. Especially in public and commercial buildings, our products help ensure that many processes run smoothly and keep millions of people safe.

24/7 Reliability.

Our products meet the most rigorous requirements and are suitable for use in a wide range of fields. For example, our visual and audible signaling devices: They alert in the event of danger, fire, burglary, accident or technical faults and warn people in every corner of a building – even in large public areas such as railway stations. Our products even provide safety in aviation, for example when used to light up obstacles such as tall buildings and bridges.

Intelligent solutions on every corner.

Schools, hospitals, public facilities, office buildings, factories – they are all dependent on properly operating building technology. Here, our innovative thermal management solutions protect sensitive electronic control systems from failing.

Especially in winter and in a damp climate, our heaters and thermostats are indispensable. Systems that they reliably protect include: control barriers, overhead roller doors, parking ticket dispensers, and access controls. They protect against condensate risks and ensure that a variety of processes run smoothly.

Our Thermal management for electronic controls solutions are designed for the safety of commercial and public buildings.



Mini-radiant Heater PRH



Thermostat FLZ 510

Road works: More than just a light at the end of the tunnel.



The steady growth of traffic in metropolitan areas and growth in provinces creates the need for traffic routes to operate smoothly. As part of this infrastructure plan as there is a need for the construction of new roads and tunnels. Here, our products make a vital contribution to the development and maintenance of the infrastructure.

Safety for guidance and measurement systems.

To direct traffic and monitor emission levels, guidance systems and environment impact measurement devices are used. Using specific components and solutions, we ensure that these systems work perfectly in rain, frost, humid environments, and summer heat. Our cooling units prevent sensitive control units from overheating while thermostats and hygrometers protect them from cold and the associated risks of condensate.



Air/water Heat Exchanger

Individual solutions for tunnel projects.

The construction of roads and especially of tunnels place high demands on the reliability of signaling and thermal management technology. In tunnel construction, vast drilling machines are used, with control units cooled by powerful air/water heat exchangers, needing reliable protection against condensates by heaters with integrated thermostatic systems.

In addition, the thermal management for central control systems is very demanding. Minimum maintenance requirements, resistance against alternating pressure loads, and compatibility with networks for remote monitoring are only some of the criteria which we meet with our applications.

Our products are monitoring the traffic in the tunnel sections of Paris motorways, in the Lötschberg tunnel, in the Rennsteig tunnel, and in the Gotthard base tunnel – the longest railway tunnel in the world.



For more information about our solutions for tunnel construction, please see the Gotthard base tunnel example in the Solutions chapter on page 138.

Aviation: Non-stop safety for airports.



In the Middle East and in Asia where mega hubs are developing, particularly in China, airport construction is booming. The number of flights and passengers is increasing globally – coupled with the need for reliable safety technology. For airport builders and operators around the world, we are sought-after as a partner with the specific expertise for a variety of safety-relevant applications.

Perfect processes in the tower and below.

Maximum operational reliability in airport control centers. Vital recording devices in the control tower are protected against overheating by cooling units. Our cooling units provide reliable and energy-efficient cooling for X-ray equipment in luggage inspection. We even provide specific solutions for the parking areas outside airports, such as heaters, thermostats and hygrometers, to protect parking ticket dispensers reliably against corrosion.

Visual and audible signaling everywhere.

In all locations within an airport, signaling solutions must be visible and heard in order to be noticed in the event of an alarm. On towers, buildings and cranes, LED obstacle warning lights alert aviation – especially planes taking off or landing. In the luggage pickup area, continuous and flashing lights signal the start and operation of the conveyor belts. In the event of a gas or fire alarm, visual/audible signaling devices alert visitors and staff.



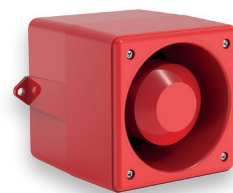
DTS Cooling Unit Series



Flashing Light ABL/ABS



Hygrostat FLZ 610



Sounder DS 10



Port and shipping industry.

Tankers, bulk carriers and container ships transport 90% of all commercial goods from port to port. Both, on board and in the dockyards and terminals, our products help to get these goods shipped quickly and safely to their destinations around the globe.

At the heart of port logistics.

Without the reliable work of hydraulic cranes and container bridges, any port would grind to a halt. The electronic control systems must be protected against overheating, condensate and corrosion so that loading and unloading runs smoothly. Our thermal management solutions do this while requiring minimum maintenance costs and providing maximum energy efficiency.



Visual and audible alarms signal loading capacities, warn of movements and give alerts about strong winds. At terminals, our lighting solutions ensure safe operation of automatic traffic guidance systems.

Safety on board.

Our signaling and alarm components are used on freighters, cruisers, navy ships, and on submarines. Visual and audible signaling devices are used here as well. In the machine room – they notify of gas leakages and in cabins – they trigger fire alarms.

Water and wastewater industry.

Whether its municipal or industrial water applications, we ensure the reliable operation of water systems worldwide – from water extraction and treatment to water distribution and wastewater treatment.

Solutions for the whole process chain.

For example, in drinking water treatment plants, users of ozone, UV systems and VFD pumping systems rely on our thermal management solutions to protect control systems. Innovative cooling units and robust NEMA 4X and UL-certified cooling units protect switching systems against overheating, condensate and corrosion.

In the field of pumps, controls and machines, our SIL/PL compliant signaling devices are used. They display process states and alert in the event of danger, fire, accident and technical faults. In water treatment facilities, where hazardous vapours can occur, for example during sludge treatment and in digestion tanks, their explosion-proof versions are used.

Reducing energy costs and protecting the environment.

Water and wastewater treatment plants are very energy-intensive – our devices offer the opportunity of cutting the plant's energy costs and of improving environmental awareness.



Wind energy: Highly efficient technology for an emerging industry.

The development of wind energy is advancing steadily. It is a development we have been supporting for 15 years. The world's leading system manufacturers and their suppliers place their confidence in our innovative thermal management and signaling solutions.

Available in every region.



Plants in offshore wind parks are exposed to high humidity – reliable thermal management is provided by air/air heat exchangers which hermetically protect the interiors of electrical enclosures from harsh environmental conditions. Protection against condensate formation is provided by the use of thermostats and hygrostats. They control humidity and temperature, also are combined with heaters or Filterfans® for electrical enclosures.

In the rotor hub, DTS Cooling Units are used for the optimum cooling of the pitch regulators. The compact cooling units are resistant against vibrations and impervious to humidity, dust, sand and major temperature fluctuations. Properties which make them ideal for offshore installations whatever the environment.

In almost all modern systems frequency converters are used. Air/water heat exchangers are the appropriate means of maintaining maximum availability of their sophisticated control electronics even at high ambient temperatures. The maintenance-free air/water heat exchangers made from corrosion-free stainless steel provide energy-efficient cooling, even when exposed to salt fog and dust.

Innovation in confined spaces.

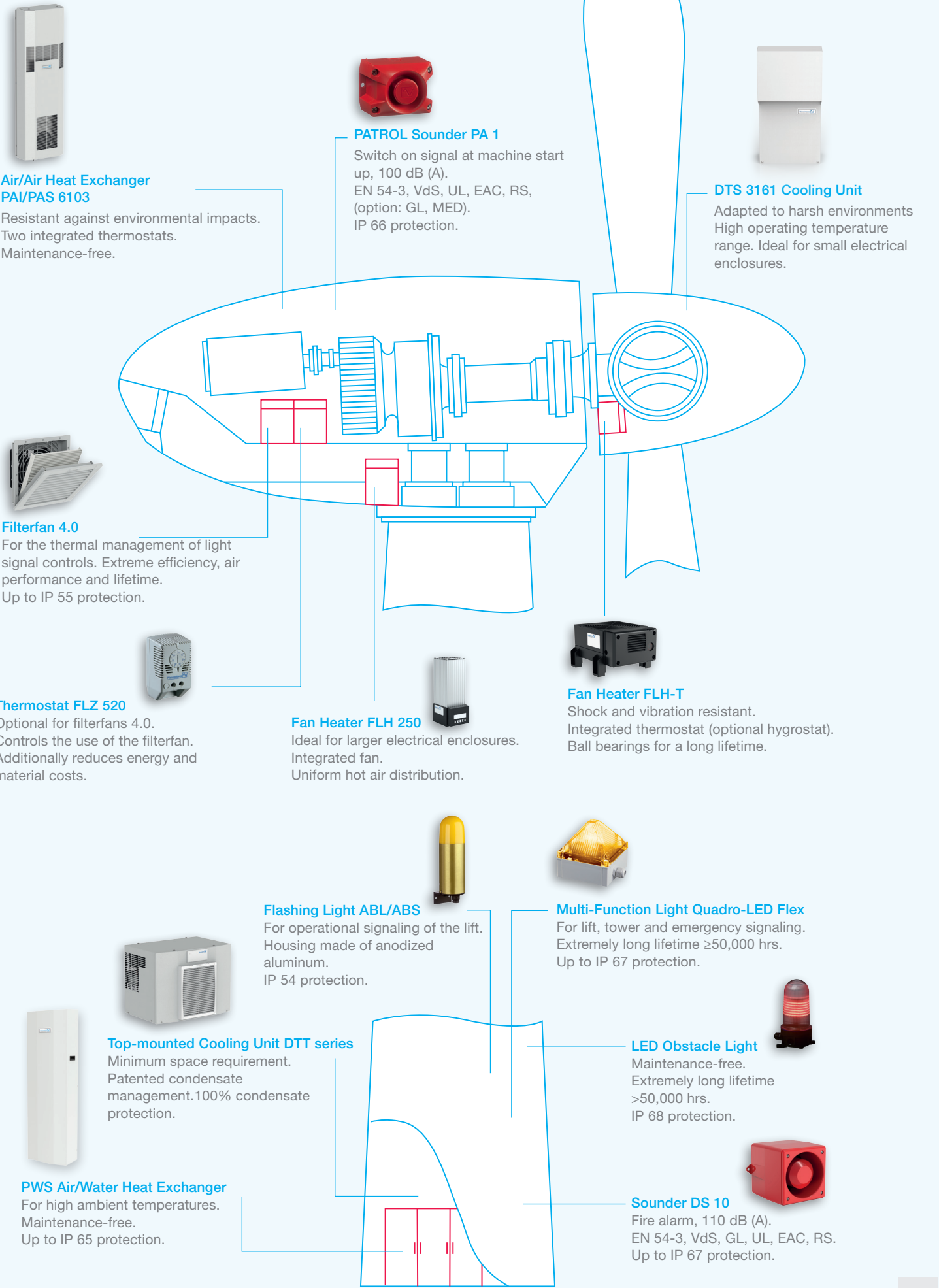
To start up the rotor safely after a stoppage due to weather or maintenance, we have developed a compact, vibration-resistant fan heater. With performance levels ranging from 853 to 3412 BTU (250 to 1,000 W), with a storage and operating temperature of -40 °F to +158 °F (-40 °C to +70 °C) it delivers pitch regulation availability even under extreme conditions.

Where the air is contaminated with dust and sand, our Filterfans® provide reliable cooling for the control units. Thanks to their patented fluted filter mat, they achieve IP 55 protection and a 300% longer product life. Flow-optimised fins and rotor blades allow for maximum airflow and minimum energy consumption.

At the base of the wind turbine, there are controls to regulate the torque of the drive train. The innovative DTT series top-mounted cooling units provide a space-saving and efficient thermal management solution for this application. The patented condensate management completely protects the interior of electrical enclosures against condensate and ensures maximum component availability due to its reliable cooling function.

Signaling and alarms.

Our extremely robust signaling solutions contribute to the smooth operation of wind energy plants – including obstacle warning lighting for aviation, state displays for the tower lifts and audible signals when starting up the plant and fire alarms.





SERVICES

Pfannenberger Global Services. Your One-source Solution Wherever and Whenever You Need It.

Our thermal management services are available worldwide. Our comprehensive service team is available wherever and whenever you need it. Pfannenberger's innovation has made it one of the largest globally operating manufacturers of thermal management and process cooling equipment.

Pre-Sales Services

Have a cooling question? Our comprehensive consulting approach, ensures that all of the technical and economic aspects of your thermal management solution are taken into account in order to achieve greater reliability, energy saving and cost optimization. **Benefit from the knowledge shared through our global services team.**

Engineering Services

From concept to the finished product Pfannenberger is your reliable partner. Need help developing a cooling solution for a large project, machine or specific industry application? Pfannenberger's engineering services include product development, climate testing, CF design and project management. We welcome every opportunity to provide innovative solutions for your most demanding applications.

After-Sales Services

We understand how critical thermal management systems are for keeping applications running and online. After sales support includes preventative maintenance programs, spare part stocking programs, onsite repair, training and regular maintenance. We offer proactive repair and replacement, our service is not limited to Pfannenberger products but also the units of all other manufacturers.

Benefit from the shared knowledge of a global services team.

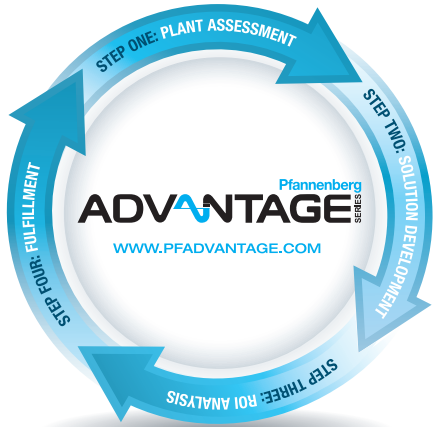
The ambient conditions from one facility to another can differ, posing unique challenges for both end-users and OEMs. End-users get frustrated with overheating electronics and equipment failures, OEMs get frustrated when getting calls because their machines are down. If equipment goes down due to a thermal management failure, most times it is due to a machine being undersized or the incorrect thermal management equipment being used. Our sales and service team can alleviate both of these challenges from different vantage points. **This is the Pfannenberg Advantage.**

Plant Surveys and Audits

Reliable thermal management is critical to keeping processes online and running. The most common place for Pfannenberg to start is to visit your facility and perform a plant survey.

Plant Surveys include:

- Overview of facility conditions (ambient airborne particulate, temperature, humidity)
- What are the current systems in the plant, how many and where are they located
- Current plant safety regulations
- 24/7 Machine Time (when can we repair or replace equipment)



visit www.pfadvantage.com

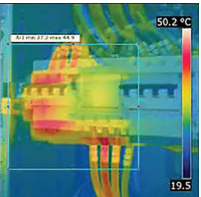
Once a plant survey is created, we then have enough data to provide a comprehensive plant audit. A plant audit is a detailed analysis of what’s in the enclosure and the current needs by means of capacity, energy use and repair time cost. **Please consult the factory for a quotation.**

Plant Audits include:

- Overview of facility conditions (ambient airborne particulate, temperature, humidity)
- What are the current systems in the plant, how many and where are they located
- Current plant safety regulations
- 24/7 Machine Time (when can we repair or replace equipment)
- Detailed analysis of current thermal management needs based on true capacity requirement. This is done by reviewing components within the enclosure
- Energy analysis based on current thermal management system
- Personalized thermal management program designed around your existing requirements and goals

Thermal Imaging Analysis

Contract Pfannenberg to use our thermo-graphic equipment to see into your electrical enclosures and surrounding areas to get a true snapshot of the climate. Two ways we can approach this is to calculate the dissipation of heat based on the components within the enclosure or through the calculation of heat dissipation based on recorded temperature.

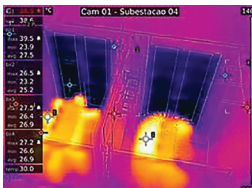


Component Based Heat Calculations:

A thermal camera would be used to capture hot-spots based on enclosure components. The imaging would clearly show the hottest areas in red and the coolest areas in blue. Using this imagery allows us to provide a clear explanation and analysis of hot heat is being generated and where it is having the greatest impact.

Recorded Temperature Heat Calculations:

Using a special thermal camera we are able to accurately measure the recorded temperature inside and outside the enclosure. This analysis can be recorded as a single one-time snapshot or over the course of several hours to get an accurate representation of the fluctuations in temperature based on time of day or manufacturing processes.



Energy Consultation

Many facilities we visit have energy savings initiatives. Are your thermal management products sized properly? Can you use existing sources such as tower water or chilled water to cool your electrical enclosures? Will adding a thermostat to your Filterfans® reduce energy costs by only running the fans when needed? Our team will analyze your current energy usage related to thermal management systems. After our analysis, we will submit a proposal recommending equipment upgrades and repairs to give you the maximum energy reduction. Once the updates have been completed, we will work with your local energy provider to document and submit the required paperwork for any qualified energy rebates, which can offset the costs of the project.

Analysis and Project Management

Analysis is performed by Pfannenberg to come up with multiple solution ideas. This step of the process leads the team (installers, distributors etc.) to a final proposal.

Spare Part Kits

Specific spare part kits are available for each DTS range of Cooling Units to ensure the best reliability of your unit. By using our original spare parts, downtime is reduced to a minimum or longer downtimes are prevented.



Pfannenberg Sizing Software (PSS)

Use our thermal management software to guide you through the sizing process, step-by-step to calculate the correct solution for your application. **The sizing software is available directly on your computer visit <https://www.pfannenbergusa.com/pss>**



Helping bring new products to market.

Pfannenber's engineering services include product development, climate testing, CF design, project management and installation. To achieve this, we work with a unique consultative approach and first-class standard products, custom products and solutions as well as wide-ranging engineering services. We welcome every opportunity to provide innovative solutions for your most demanding applications.

Product Development

Pfannenber's research & development facility offers the perfect venue for evaluating your products within the thermal management realm.

We can provide the resources needed to turn your basic product ideas into well-developed, revenue-generating products in less time, and for less cost, than you might expect. Lower your fixed costs by letting our professional team of experienced engineers handle your R&D so you can focus on the "big picture."



Research and Development Engineering Services

- Conceptualization
- Development of specifications and test plans
- Design
- Flow simulation (CFD)
- Prototype construction
- Prototype validation
- Document management
- Non-Recurring Engineering (NRE)

Engineered Solutions

Bring us your application and we will work together on a perfect thermal management solution; with standard products, customized products, custom made complete solutions – even including services if necessary. **Let us be your first tier engineering consultant to solve your thermal management requirements from both, a plant and machine level perspective. See page 132**

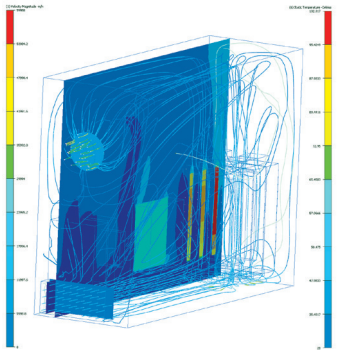
Industry Group Solutions

Our products and solutions are used throughout different industry sectors – worldwide. Our knowledge of supply chains and specific thermal management demands makes us a sought-after partner of leading companies in industries such as automotive, machine and plant construction, energy, food and beverage and infrastructure.

See page 152

Computational Fluid Dynamics Analysis for Electronic Enclosure Solutions

By addressing complex flow and thermal challenges up front in the design process, a complete performance picture is captured – allowing our customers to get their products to market faster, deliver more innovative, efficient and profitable solutions, and reduce overhead and offering price as well as reduce warranty exposure. Fast, affordable, cost-effective project support for companies who have the need for CFD analysis, but not the budget.



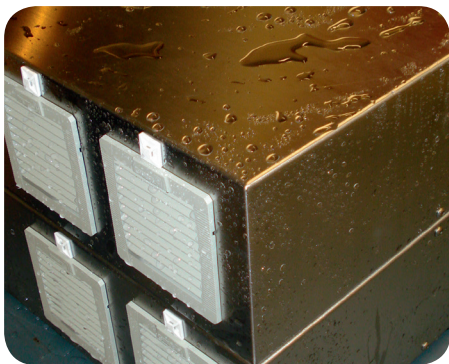
Product Design & Validation

The cost of maintaining a testing laboratory for product validation is prohibitive for many companies. Pfannenber is pleased to offer our well-staffed, state-of-the-art testing facilities as an economical alternative to in-house validation. An extensive range of testing services is available to provide a detailed evaluation of your product.

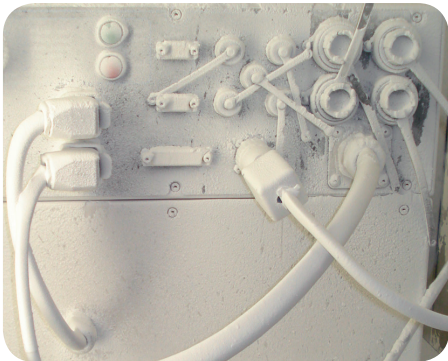
- Environmental simulations in the climatic chamber
- Infrared measurements
- Protection class tests (IP protection)
- Transport and vibration tests
- Air quantity and light intensity measurements
- EMC tests / noise emission tests
- Air flow simulation (CFD)
- We work with you to develop a goal-specific testing plan; we organize and perform all necessary tests, and deliver a comprehensive report



Air Test Facility



IP Water Test Equipment



IP Dust Test Equipment

Industry 4.0 / Internet of Things

Increasing digitalization opens new possibilities for controlling production plants and for machine to machine communication. As a global leader in the area of thermal management of electrical enclosures and process cooling our engineers can work with your team to provided cloud based and connected solutions for our equipment into your Industry 4.0 strategy.



READING DIAGNOSIS
AND ALARM DATA



WORLDWIDE
COMMUNICATION



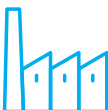
AUTOMATIC
SERVICES



STORAGE AND EVALUATION
LOG DATA

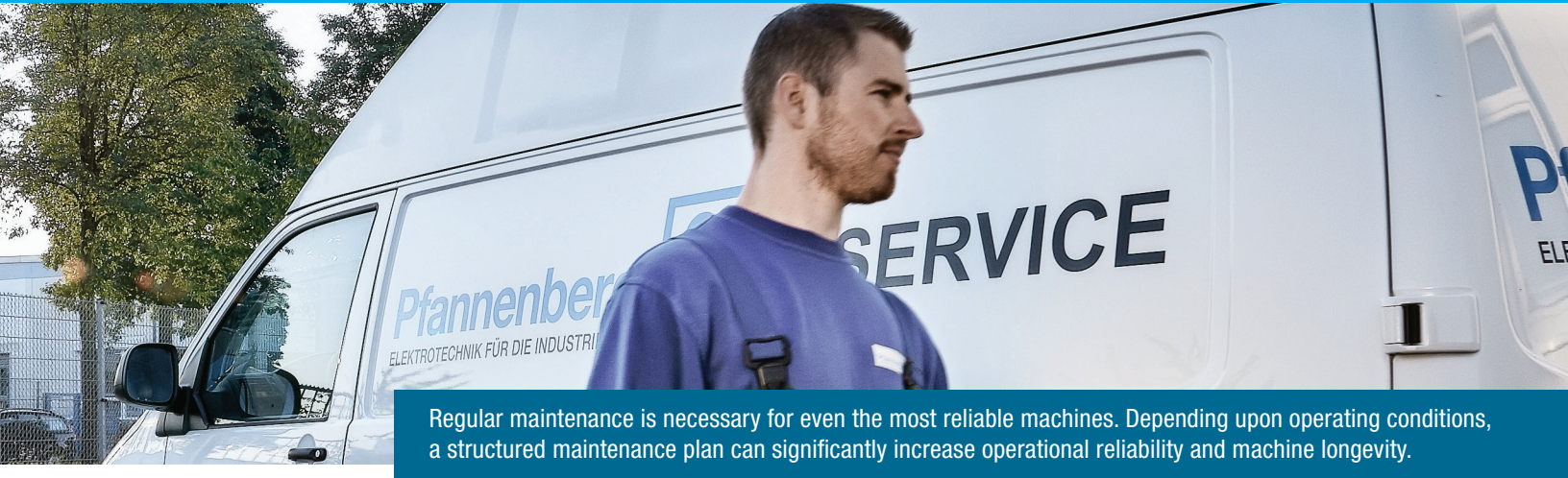


NETWORK
SECURITY



CONNECTION TO MACHINE
AND PROCESS CONTROLS

Proper Maintenance Promotes Reliability and Longevity.



Regular maintenance is necessary for even the most reliable machines. Depending upon operating conditions, a structured maintenance plan can significantly increase operational reliability and machine longevity.

Preventative Maintenance

Pfannenberg's products are designed and manufactured to the highest quality standards - resulting in longer running times, even under extreme operating and environmental conditions. Service contracts are available to further ensure optimal performance of our products and to prevent expensive, unscheduled downtime. Regular maintenance, even once or twice per year, significantly reduces the probability of failure and increases machine reliability.

Our technicians have been trained on original products and know them thoroughly. They come to your factory with ready access to the latest measuring and control software. Our technician can also help you to optimize your factory and processes with equipment cleaning, inspection and other maintenance measures.

Preventative Maintenance includes:

- Checking the essential functions of the unit
- Checking and exchanging consumable parts
- Necessary cleaning
- Readjustment of control and regulating modules
- Proper tools and measuring instruments
- Preparation of a maintenance report and a list of any parts needed for repairs



Regular maintenance ensures high energy efficiency of Pfannenberg products – lowering energy costs while benefiting our environment.

On-site Repairs & Replacement



Our service technicians provide support for:

- Pfannenberg offers proactive repair and replacement consultancy for both our own products and our competitors
- Pfannenberg can manage and optimize any service or maintenance budget to help customers reduce unplanned downtime or machinery
- Spare part crib programs & rebuild programs can be designed by Pfannenberg to fit your needs



Installation Support and Commissioning

Pfannenberg offers worldwide professional installation services, commissioning and start-up services to ensure that new systems get off to a good start avoiding improper installation and/or set-up issues that can cause machine failure or loss of production, especially for chilled water systems. We offer professional commissioning of your cooling systems anywhere in the world.

Our service technicians provide support for:

- The conversion, expansion or relocation of your existing cooling solution
- Professional installation and validation of application
- Commissioning of new devices in your manufacturing facilities
- On-site training for customer's maintenance staff

Commissioning includes:

- Verifying the design & installation of secondary coolant loop piping (in the case of water chillers)
- Verifying electrical service and connection
- Verifying proper installation and connection of the chiller to the piping system
- Filling the secondary circuit with coolant
- Initial start-up of the system
- Measurement and documentation of all technical data
- Acceptance and release to the user
- Preparation of an acceptance protocol

Training Courses

In order for your employees to develop a better understanding of air conditioning technology, we also offer training courses. This allows your employees to recognize problems faster and to make the correct decisions for the repair and resumption of production with greater reliability. The result is more economical and trouble-free operation of the systems. These training courses can be held at Pfannenberg, or at your location.



The standard contents of a training course:

- General information on refrigeration technology (circuit, components, functional sequences)
- The unit - relating to the customer's application
- Commissioning of a refrigeration unit
- Fault simulation, fault recognition
- Remedial actions for faults during commissioning
- How to make contact in the event of a fault
- Information about the work processes and the flow of documentation in the event of a fault

SPARE PARTS AVAILABILITY



DID YOU KNOW?

No matter where you are located, quick access to spare and wear parts is available worldwide through Pfannenberg's Global Parts Program.

- Standard spare parts are always in stock at one of our service centers and ship within 24 hours
- Manufactured spare parts may be in stock or built to order. These ship from one of our factories within 48 hours
- Specific spare part kits are also available for each DTS range of Cooling Units to ensure the best reliability of your unit

The Pfannenberg Group Worldwide Support

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