Get ready for a revolutionary new way

to cool your electrical enclosures

PFANNENBERG
KINETIC SYSTEM™

THERMAL MANAGEMENT FOR ELECTRICAL ENCLOSURES

Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY

The Technology of Cooling for Electric Enclosures

	PASSIVE COOLING			**ACTIVE** COOLING	
Description	Cooling techniques relying on natural heat transfer using minimal energy.			Cooling techniques relying on external devices to increase the rate of heat removal using mechanical and/or electrical energy.	
Technology	Fans & Exhaust	**Heat Exchangers**		Cooling Units	Thermo Electric Cooler
		Air to Air	Air to Water		
Level of Protection	Open Loop	Closed Loop	Closed Loop	Closed Loop	Closed Loop
Energy Usage					

Open Loop - Exchange of air inside of enclosure with surroundings.
Closed Loop - Sealed system separating internal and surrounding air.

Air/Air Heat Exchangers

One of the best technologies to use when there is a temperature difference between the internal target temperature and the surrounding temperature is air to air technology (ΔT≥10°C). An air/air heat exchanger removes heat from inside of the enclosure to the cooler environment using the least amount of energy while still providing a closed loop ingress protection.

IDEAL APPLICATIONS

FOOD & BEVERAGE
- Temperature controlled environment providing required ΔT
- Wash down requirement
- Protection against corrosion and contamination
- Energy conscious

VARIABLE FREQUENCY DRIVES
- Technology advancement in VFD
- Drives are rated to a min. of 103°F; this allows for the required ΔT needed for an air/air heat exchanger

IT - INDUSTRIAL 4.0
- Digital technology is more prominent and connectivity is crucial
- Stand alone IT racks in factories that house sensitive components
- Components that require cooling and dust protection

AGRICULTURE
- Technology advancement with remote sensors and drives
- Requires low maintenance solution
- Harsh environments with rain and dust
- Irrigation system with pumps and drives

INDUSTRIAL AUTOMATION
- Processing, assembling and packaging equipment
- Automation, textile and paper finishing
- Indoor applications where avoiding downtime is critical

RUBBER/PLASTIC PROCESSING
- Harsh & corrosive environment
- Climate controlled environment providing the required ΔT

PKS 3000 SERIES | AIR/AIR HEAT EXCHANGERS

22-180 W/°C

The PKS 3000 Series Air/Air Heat Exchangers use **Pfannenberg's Kinetic System™** next generation cooling to exchange and remove heat from an electrical enclosure. This is a perfect solution when concerned with the open loop designs that don't prevent corrosive gas, humidity and dust from entering the enclosure. Designed for indoor cooling, outdoor or remote applications that require a closed loop system to protect electronics. Available in 4 models; PKS 313X, PKS 320X, PKS 330X, PKS 336X.

PFANNENBERG **KINETIC SYSTEM™**

Next generation cooling technology that out-performs conventional heat exchanger and/or heat pipe solutions.

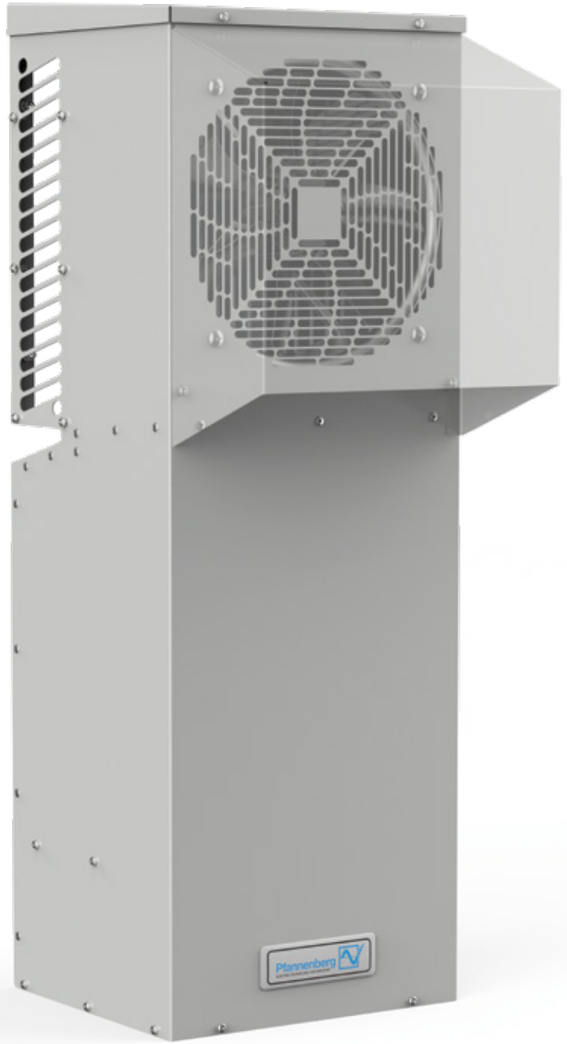
Best CCPD™
Produces superior Cooling Capacity Per Density vs. conventional heat exchanger and/or heat pipe solutions. One of the most compact units for the available cooling capacity.

Energy Efficient
Utilizes lower temperature ambient air to cool warmer internal air without an active component such as a compressor which consumes high amounts of energy.

Narrow Width
Width of the unit is maintained at 12 inches to fit onto the side of a smaller NEMA enclosure.

Reduced Maintenance
With only two mechanical components (fans), potential failure point is reduced to ensure continuous uptime of your processes.

Flexible Mounting Options
Unit can be installed vertically or horizontally, allowing the cool air to be focused where it is needed most.



Closed Loop Design
Designed to isolate external ambient air from internal air eliminating the risk of contaminants entering the cabinet. Compared to Filterfans® with Rainhoods; the PKS seals against gaseous substances, humidity and airborne particulates such as dust, keeping it away from sensitive components within the electrical enclosure.

Easy Installation
Compact lightweight design means that the unit can be installed by just one person.

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

Eliminates Hotspots
High CFM fan with superior air flow, ideal for eliminating hot spots.

c UL us LISTED

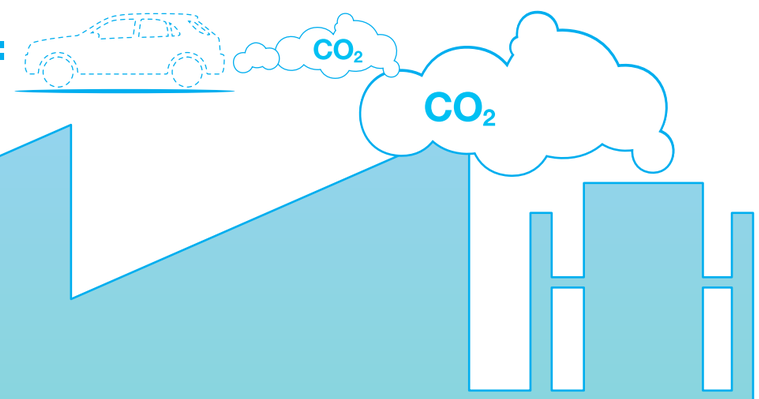
PATENT PENDING

REDUCE

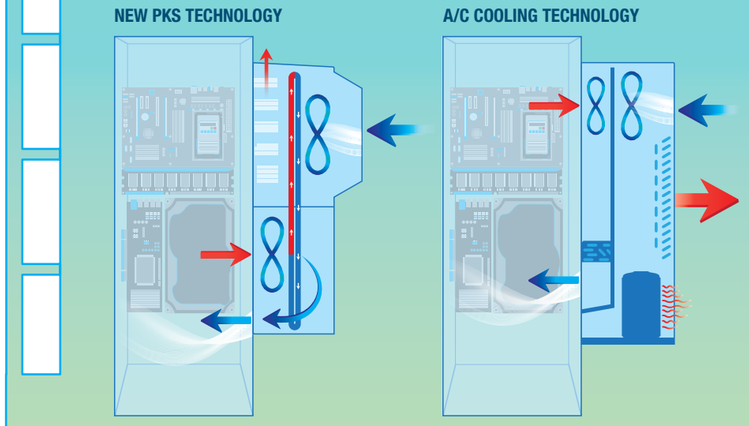
ENERGY MAINTENANCE SPACE

DID YOU KNOW?

Replacing 2 A/C units with 2 PKS units is equivalent to **Removing the Carbon Footprint of ONE VEHICLE!**



TECHNOLOGY **COMPARISON**

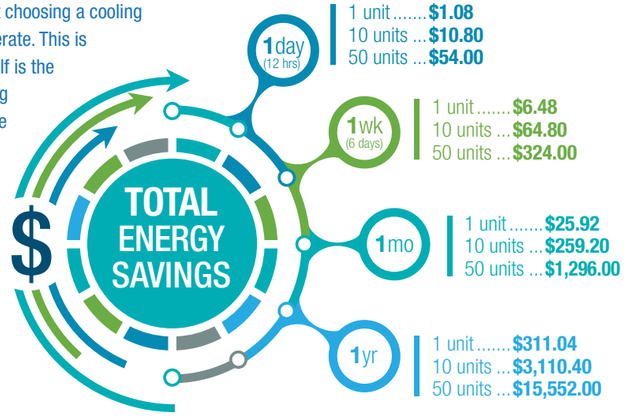


	PKS 3361	DTS 3141 SL
POWER CONSUMPTION	**353** Watts	**917** Watts
MONTHLY OPERATING COST (360 hr @ $.12 / kwhr)	$15.12 / month	$39.61 / month
POTENTIAL MAINTENANCE COST	$600	$3,700
COOLING CAPACITY PER DENSITY (CCPD)	1.33	1.32

TOTAL COOLING SYSTEM POWER AUDIT

Total energy savings is more than just choosing a cooling unit that consumes less energy to operate. This is only half of the equation. The other half is the amount of heat released by the cooling unit to the surrounding area, which the HVAC building system would then have to remove outdoors.

Power Consumption	PKS	A/C
Cooling Units	353 Watts	917 Watts
HVAC System (To remove heat generated by cooling unit)	120 Watts	306 Watts
TOTAL COOLING SYSTEM	473 Watts	1,223 Watts



REDUCE **MAINTENANCE**

Total cost of ownership includes potential repair or replacement. The simple design of the PKS means that only the fan has the potential to be replaced.

Potential Mechanical Failure Point	Estimated Cost to Repair/Replace	Meantime Between Failure (MBTF)	A/C	Filter-fans®	PKS
Fan	$600	60,000 hrs	X	X	X
Compressor	$1,400	78,000 hrs	X		
Expansion Valve	$800		X		
Condensate Tray	$300		X		
Brazed Joints	$600		X		
Filters	$20	2,000-4,000 hrs		X	

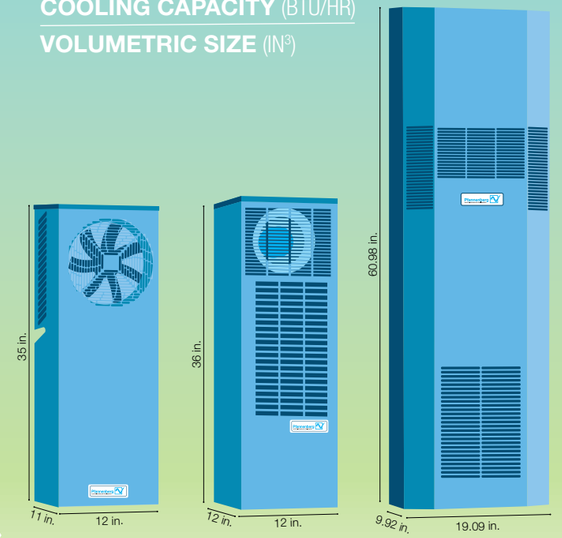
CCPD™ | COOLING CAPACITY PER DENSITY

Heat removal capability compared to the physical size (volume) of the cooling unit. Higher ratio indicates higher cooling power per volumetric size.

CCPD™ =

COOLING CAPACITY (BTU/HR)

VOLUMETRIC SIZE (IN^3)



PKS 3361	DTS 3141 SL	PAI 6203
$\frac{6,142\ BTU/hr}{4,620\ in^3} = 1.33$	$\frac{6,850\ BTU/hr}{5,184\ in^3} = 1.32$	$\frac{3,412\ BTU/hr}{11,497\ in^3} = 0.30$

(Based on △T 10°C)

PKS 313X (65 Watts/°C) Kinetic System Air/Air Heat Exchangers

Model Number	Part Number	Voltage 50/60 Hz (VAC)	Specific Cooling Capacity (W/°C)	Specific Cooling Capacity (W/°F)	Cooling Capacity @ △T = 20°C (BTU/hr)	Power Consumption (Watts)	Nominal Run Current (Amps)	Mounting Dimensions* (Inches) Width	Depth	Height	Weight (without packaging) (lbs)
PKS 3131 Indoor Rated (NEMA Type 12)	12480311005	115	65	36	4,400	75	<1	12	11	35	44
	12480321005	230	65	36	4,400	75	<1	12	11	35	44
	12480331005	400/460	65	36	4,400	75	<1	12	11	35	47
PKS 3133 Outdoor Rated (NEMA Type 3R/4)	12480313005	115	65	36	4,400	75	<1	12	11	35	50
	12480323005	230	65	36	4,400	75	<1	12	11	35	50
	12480333005	400/460	65	36	4,400	75	<1	12	11	35	53
PKS 3134 Washdown (NEMA Type 4/4x)	12480314008	115	65	36	4,400	75	<1	12	11	35	50
	12480324008	230	65	36	4,400	75	<1	12	11	35	50
	12480334008	400/460	65	36	4,400	75	<1	12	11	35	53

PKS 320X (100 Watts/°C) Kinetic System Air/Air Heat Exchangers

Model Number	Part Number	Voltage 50/60 Hz (VAC)	Specific Cooling Capacity (W/°C)	Specific Cooling Capacity (W/°F)	Cooling Capacity @ △T = 20°C (BTU/hr)	Power Consumption (Watts)	Nominal Run Current (Amps)	Mounting Dimensions* (Inches) Width	Depth	Height	Weight (without packaging) (lbs)
PKS 3201 Indoor Rated (NEMA Type 12)	12480511005	115	100	56	6,800	75	<1	12	11	35	44
	12480521005	230	100	56	6,800	75	<1	12	11	35	44
	12485331005	400/460	100	56	6,800	75	<1	12	11	35	47
PKS 3203 Outdoor Rated (NEMA Type 3R/4)	12480513005	115	100	56	6,800	75	<1	12	11	35	50
	12480523005	230	100	56	6,800	75	<1	12	11	35	50
	12480533005	400/460	100	56	6,800	75	<1	12	11	35	53
PKS 3204 Washdown (NEMA Type 4/4x)	12480514008	115	100	56	6,800	75	<1	12	11	35	50
	12480524008	230	100	56	6,800	75	<1	12	11	35	50
	12480534008	400/460	100	56	6,800	75	<1	12	11	35	53

PKS 330X (150 Watts/°C) Kinetic System Air/Air Heat Exchangers

Model Number	Part Number	Voltage 50/60 Hz (VAC)	Specific Cooling Capacity (W/°C)	Specific Cooling Capacity (W/°F)	Cooling Capacity @ △T = 20°C (BTU/hr)	Power Consumption (Watts)	Nominal Run Current (Amps)	Mounting Dimensions* (Inches) Width	Depth	Height	Weight (without packaging) (lbs)
PKS 3301 Indoor Rated (NEMA Type 12)	12480811005	115	150	83	10,200	353	3	12	11	35	54
	12480821005	230	150	83	10,200	245	<2	12	11	35	54
	12480831005	400/460	150	83	10,200	245	<1	12	11	35	64
PKS 3303 Outdoor Rated (NEMA Type 3R/4)	12480813005	115	150	83	10,200	345	<3	12	11	35	60
	12480823005	230	150	83	10,200	245	<2	12	11	35	60
	12480833005	400/460	150	83	10,200	245	<1	12	11	35	70
PKS 3304 Washdown (NEMA Type 4/4x)	12480814008	115	150	83	10,200	345	<3	12	11	35	60
	12480824008	230	150	83	10,200	245	<2	12	11	35	60
	12480834008	400/460	150	83	10,200	245	<1	12	11	35	70

PKS 336X (180 Watts/°C) Kinetic System Air/Air Heat Exchangers

Model Number	Part Number	Voltage 50/60 Hz (VAC)	Specific Cooling Capacity (W/°C)	Specific Cooling Capacity (W/°F)	Cooling Capacity @ △T = 20°C (BTU/hr)	Power Consumption (Watts)	Nominal Run Current (Amps)	Mounting Dimensions* (Inches) Width	Depth	Height	Weight (without packaging) (lbs)
PKS 3361 Indoor Rated (NEMA Type 12)	12480911005	115	180	100	12,200	353	<3	12	11	35	54
	12480921005	230	180	100	12,200	245	<2	12	11	35	54
	12480931005	400/460	180	100	12,200	245	<1	12	11	35	64
PKS 3363 Outdoor Rated (NEMA Type 3R/4)	12480913005	115	180	100	12,200	345	<3	12	11	35	60
	12480923005	230	180	100	12,200	245	<2	12	11	35	60
	12480933005	400/460	180	100	12,200	245	<1	12	11	35	70
PKS 3364 Washdown (NEMA Type 4/4x)	12480914008	115	180	100	12,200	345	<3	12	11	35	60
	12480924008	230	180	100	12,200	245	<2	12	11	35	60
	12480934008	400/460	180	100	12,200	245	<1	12	11	35	70

PKS Mini 30X2 (22 & 45 Watts/°C) Heatsink Air/Air Heat Exchangers

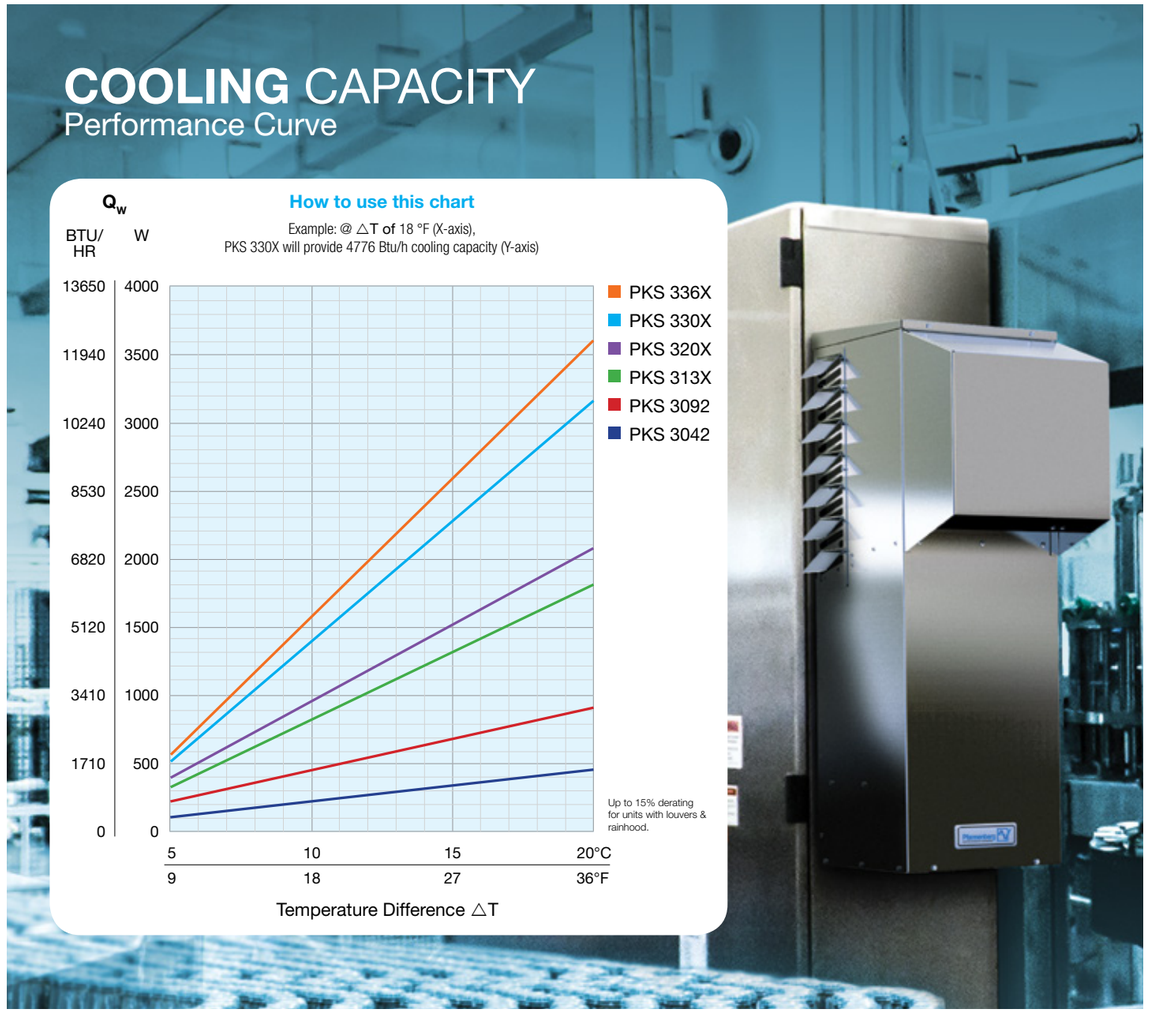
Model Number	Part Number	Voltage 60 Hz (VAC)	Specific Cooling Capacity (W/°C)	Specific Cooling Capacity (W/°F)	Cooling Capacity @ △T = 20°C (BTU/hr)	Power Consumption (Watts)	Nominal Run Current (Amps)	Width	Depth	Height	Weight (without packaging) (lbs)
PKS 3042	12480112009	115	22	12	1,400	82	0.72	12	7.89	12	17
PKS 3092	12480212009	115	45	25	3,000	163	1.44	12	7.89	22.75	35
IP Rating:	ONLY available as washdown (NEMA Type 4/4X) design										

Additional Data	PKS 313X	PKS 320X	PKS 330X	PKS 336X	PKS Mini 30X2
Ambient Temp. Range	Min: -25°C / -13°F . . . +55°C / +131°F				-25°C to +55°C (-13°F to +131°F)
Control Range	20°C to 60°C (68°F to 140°F); Factory Setting 35°C (95°F)				N/A
Design	**Housing/Cover:** Indoor/Outdoor - powder coated RAL 7035 (light gray); Washdown - 304 Stainless Steel				**Mounting Plate:** powder coated aluminum **Cover:** 316 stainless steel

*Note the 3R/4/4x units have required louvers on the sides which add an additional 3" to the width and a rainhood on the front which adds an additional 4" to the depth.

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

Subject to technical amendments and misprints.



PKS 3000 SERIES | AIR/AIR HEAT EXCHANGERS

22-180 W/°C

Pfannenberg's innovation has made it one of the largest globally operating manufacturers of thermal management and process cooling equipment today. Our wide product range stretches from complete system solutions for machine cooling and enclosure air conditioning to individual warning and signaling components.

We speak your language - In addition to manufacturing facilities located on three continents, Pfannenberg has developed a worldwide network of local subsidiaries and sales partners eager to meet your service needs.

Global Service

We're there when you need us - Worldwide

Pfannenberg Service Centers
Germany (headquarters), USA, China, UK, Italy, Brazil, France, Russia, Singapore and India

Service Support Centers
Visit www.pfannenberg.com/support/service/ for a complete list.

Service Agents
Serving 42 countries on 5 continents

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