

PACKAGED CHILLER SOLUTIONS

Closing the loop for all industrial fluid cooling applications



Pfannenberg
ELECTRO-TECHNOLOGY FOR INDUSTRY



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.



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 2

COOLANT TYPE,
TEMPERATURE
& FLOW RATE



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.



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.

*Consult factory or website
for current curve data.

STEP 4

USE CHILLER
PERFORMANCE
CURVES



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.

*Consult factory or website
for current curve data.



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.

STEP 6

FINAL SELECTION



PFANNENBERG COMPACT PACKAGED CHILLERS

CC 6101-6301

UP TO 1 TON

Compact and efficient, the **CC 6101**, **CC 6201** and **CC 6301** offer many features found only in larger models. With the state-of-the-art parametric controller; functions such as refrigerant suction, condensing pressures, coolant flow and temperature are monitored to insure that the chiller is operating within specifications. These smaller frame chillers are the solution for integrated motor and/or process cooling required for high-speed machining centers. Single phase power requirements make the smallest of the Pfannenbergl chillers easily installed in most commercial and industrial settings.



- ❄ Serial produced compact packaged chiller (CC) certified to UL1995
- ❄ Rugged construction for industrial use, using non-ferrous coolant circuits with vented poly tanks
- ❄ Indoor/outdoor-rated NEMA 12/4 standard panel
- ❄ Service friendly design allows access via a hinged front panel and removable side panels
- ❄ For cooling water or water/glycol mixtures
- ❄ Many optional features including louvered stainless steel casings



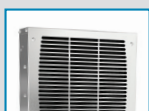
PFANNENBERG COMPACT PACKAGED CHILLERS

CC 6401-6601

UP TO 2 TONS

For a compact chiller with a bit more capacity, the **CC 6401**, **CC 6501** and **CC 6601** will provide up to two tons of packaged cooling capacity in a small footprint that shares the fully featured design of the smaller CC models. Ease of operation and service is immediately evident from the fully-hinged front access panel and removable side panels, to the large coolant fill port and tank sight gauge. The NEMA 4 electrical enclosure makes the CC chiller at home in many environments.

ENCLOSURE THERMAL MANAGEMENT & INDUSTRIAL ELECTRONICS COOLING SOLUTIONS FOR OVER 60 YEARS



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HEATERS &
THERMOSTATS



SERVICE

PFANNENBERG MODULAR PACKAGED CHILLERS

EB 30-220 WT

UP TO 7 TONS

The **EB Series** offers a variety of packaged chiller sizes to meet a wide range of applications. Up to the **EB 220** the unique modular design packages the coolant circulation and storage part of the chiller in the bottom section and the refrigeration system in the upper section. This arrangement allows warm air from the condenser to be discharged conveniently upward and allows the chiller to maintain a small footprint. These smaller of the four EB frame sizes are often customized to meet specific requirements not easily met with standard models.



Non-ferrous coolant circuits with vented poly tanks are standard up to the EB 220



EB Models 600 and larger include tandem compressors for energy savings and long life



Scroll compressors are featured on EB Models 250 and larger



Serial produced modular packaged chiller (EB 30 - 220) certified to UL1995



EB Models 250 and larger include pressure-rated coolant tanks for operation in either closed or open loop systems



Indoor/outdoor-rated NEMA 12/4 control enclosures

PFANNENBERG MODULAR PACKAGED CHILLERS

EB 250-900 WT

UP TO 30 TONS

Pfannenberg's **EB 250** through **EB 900** range of chillers bring the convenient packaged concept to up to 30 tons of cooling capacity. Fully featured and completely automatic, these chillers are easily used in modular fashion to build greater installed capacity with part-load redundancy. Even at these larger capacities Pfannenberg packaged chillers only require piping and power to create an efficient and reliable liquid cooling system. Panels certified to UL508a.



Why Choose a Packaged Chiller System?

Pfannenberg's packaged chillers are versatile and ideal for applications that have cooling requirements of 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 CC Chillers are ideal for quick setup and trouble free operation.**

1 COOLANT TANK

Large coolant tanks allow efficient cycling-based capacity control. Vented poly tanks are included for CC models and EB 30-150. Larger EB models can be operated as either vented or pressurized systems.



COOLANT TO ABSORB RAPID CHANGES IN HEAT LOAD

2 FAN(S)

Axial type condenser fans offer high air flow to reduce condensing temperatures and increase refrigeration efficiency. Fan cycling control is included on all models to provide condensing pressure control and to save energy. Fan speed control is available on EB models as part of a low ambient package.



HIGH AIRFLOW & EFFICIENT OPERATION

5 EVAPORATOR

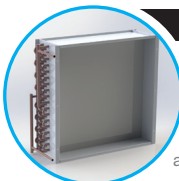
Compact and efficient, brazed-plate type evaporators are included on CC models and EB 30-150. Larger EB models feature in-tank evaporators providing large heat transfer surface, low coolant pressure loss and a compact design. All evaporators are fed by externally equalized thermal expansion valves that continuously manage refrigerant flow based on load.



EXTRA SURFACE AREA FOR LOWER ENERGY USAGE

8 CONDENSER

Large, finned-tube condensers provide high energy efficiency and fouling resistance. All EB models include cleanable, mesh-type condenser air filters as standard.



DESIGNED TO HANDLE TOUGH ENVIRONMENTS

6 COOLANT PUMP

Non-ferrous peripheral type pumps for CC models and stainless steel centrifugal pumps for EB models provide a wide range of flow and pressure capabilities to meet most application requirements.



LONG SERVICE LIFE & WIDER RANGE OF PERFORMANCE

9 CONSTRUCTION

All chillers feature galvanized steel panel construction with a polyester powder-coat finish in light gray (RAL7035). Channel bases are included to facilitate lift truck handling and permanent foundation mounting. Optional casters are available.



POLYESTER POWDER COATED TO RESIST THE ELEMENTS

3 CONTROLLER

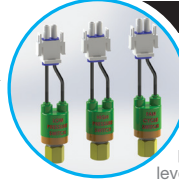
A plug-in, parametric controller with digital display provides a central processing and interface point for each chiller model. Chiller operating information is continuously available in the display, as are warning and alarm indications. A remote start/stop input and general alarm output are included as standard. Optional remote control pad with a distance up to 400 ft. is available.



CONTINUOUS DISPLAY INFO & REMOTE OPERATION

4 CONTROLS

All chillers include controls required for safe and efficient operation. High & low refrigerant pressure switches, freeze protection, flow and/or level monitoring are some of the many control components. Each chiller includes a NEMA 4 rated enclosure to protect electrical devices.



CONTROLS SUPPORT SAFE & EFFICIENT OPERATION

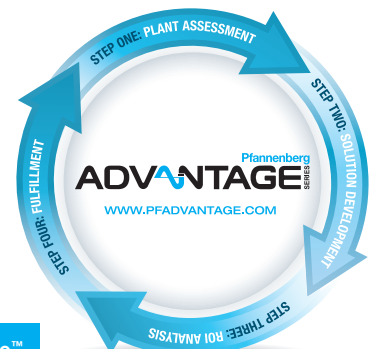
7 COMPRESSOR

Industrial reciprocating type (CC models & EB 30-150) or scroll compressors (EB 250-900) provide long service life and high efficiency. Crank-case heaters are included on all EB models and are available on CC models.



HIGH EFFICIENCY, LONG LIFE COMPRESSORS

Contact your local Pfannenberg rep to schedule a plant audit & to learn more about the Pfannenberg Advantage™.







SPECIFICATIONS

Model	Capacity*			Power Supply	Power Draw	Tank Volume	Coolant Connections	Width	Length	Height	Dry Weight
	Btu/hr	kW	Tons	V/Ph/Hz	FLA	gal	NPT-F	in	in	in	lb
CC 6101	4056	1.2	0.34	115 or 230/1/60	18/9	2.5	1/2	23.6	18.9	24.6	140
CC 6201	6551	1.9	0.55	115 or 230/1/60	21/9	2.5	1/2	23.6	18.9	24.6	147
CC 6301	9144	2.7	0.76	115 or 230/1/60	22/11.5	2.5	1/2	23.6	18.9	24.6	158
CC 6401	13268	3.9	1.11	380-460/3/50-60	9.0	8	3/4	23.6	26.4	38.7	240
CC 6501	19960	5.8	1.66	380-460/3/50-60	11.0	8	3/4	23.6	26.4	38.7	250
CC 6601	23100	6.8	1.93	380-460/3/50-60	13.0	8	3/4	23.6	26.4	38.7	260
EB 30 WT	16700	4.9	1.39	380-460/3/50-60	6.4	8	3/4	22	24	41	209
EB 60 WT	21800	6.4	1.82	380-460/3/50-60	10.0	8	3/4	22	24	41	331
EB 90 WT	43000	12.6	3.58	380-460/3/50-60	16.0	13	1	28	30	52	397
EB 150 WT	67500	19.8	5.63	380-460/3/50-60	17.4	13	1	28	30	52	496
EB 220 WT	88000	25.8	7.33	380-460/3/50-60	19.2	13	1	28	30	52	600
EB 250 WT	98900	29.0	8.24	460/3/60	18.0	45	1-1/2	30	74	57	730
EB 350 WT	151100	44.2	12.59	460/3/60	25.0	70	1-1/2	30	74	57	850
EB 450 WT	191000	55.9	15.92	460/3/60	32.0	105	1-1/2	30	74	57	895
EB 550 WT	210600	61.7	17.55	460/3/60	37.0	105	1-1/2	30	74	57	920
EB 600 WT	241000	70.6	20.08	460/3/60	40.0	105	2	35	90	82	1250
EB 700 WT	278800	81.6	23.23	460/3/60	47.0	105	2	35	90	82	1450
EB 800 WT	323000	94.6	26.92	460/3/60	54.0	105	2	35	90	82	1630
EB 900 WT	356000	104.2	29.67	460/3/60	63.0	160	2	35	90	82	1680

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

APPLICATION EXAMPLES

	Automotive (Manufacturing)		Food & Beverage		Renewable Energy
<p>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.</p>		<p>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.</p>		<p>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.</p>	
<p>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.</p>		<p>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.</p>		<p>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.</p>	
<p>Hydraulic Oil Cooling – Hydraulic power systems are the 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.</p>		<p>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.</p>		<p>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.</p>	
<p>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.</p>		<p>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.</p>			
	Automation Control Cooling				
<p>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.</p>					



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