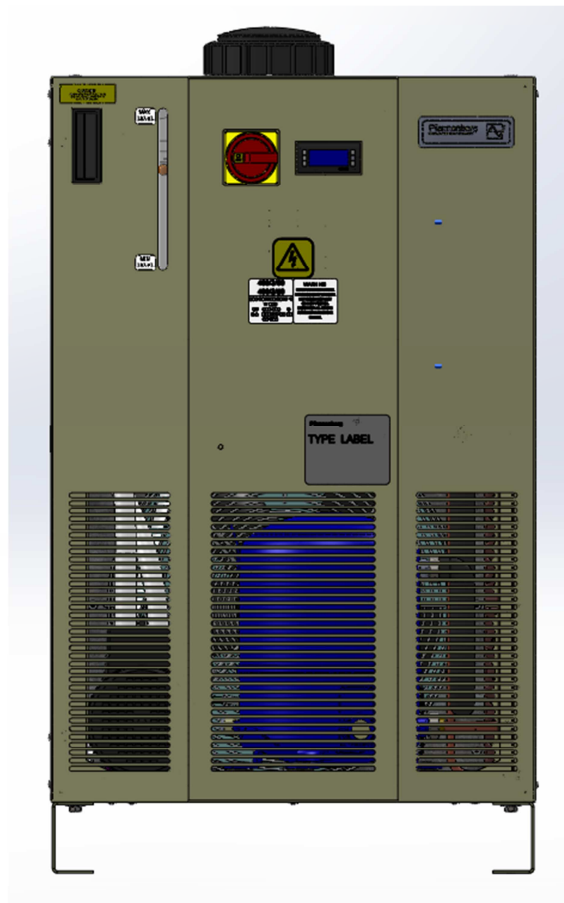


Installation, Operation and Maintenance Manual

Packaged Chiller
Models CC 6601, 6501,
6401, 6301, 6201, 6101



For Service, please contact Pfannenberg Service Company:

Part # 885501061
U.S.A.

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Section 1 - Warranty

This warranty covers the material design and quality during the first 12 months starting from the delivery date. Within this defined period our Company will either repair, or replace all parts which, on the sole opinion of the manufacturer, have caused quality problems which are not a result of poor maintenance, inexperience of the operators, faulty installation or failures which are caused because these instructions was not followed. The standard warranty only covers replacement parts. No labor warranty of any type is included.

This warranty does not include the expenses, travel hours and travel costs related to our factory technicians/representatives in case their presence is required at the customer's factory. These expenses will be invoiced as working hours. The customer shall not have the right to claim any refund from our Company for the time during which the machine shall remain inactive, related to repairs.

No refund will be acknowledged for expenses, damages, either direct or indirect, which are a result of the equipment breakdown or misuse.

Section 2 - Safety

These instructions should be read by the personnel in charge of installation, operation and maintenance prior to the starting of the equipment.

All safety and security instructions given in this manual must be observed

Only qualified personnel are allowed to install, operate and/or perform maintenance work on the equipment.

Failure to observe these instructions may cause injuries and/or equipment damage and will cancel the manufacturer's liability.

National regulations on accident prevention, regulations of the local power supply authorities as well as any specific safety instructions for equipment must be observed.

The safety of the unit is only guaranteed if it is used as intended.

Section 3 - Functional Description

This equipment has been designed to provide chilled (12° C - 18°C) process fluid for use in secondary equipment. The refrigerant circuit consists of a reciprocal compressor, open storage tank, air cooled condensing coil, expansion device and brazed plate heat exchanger. The temperature of the liquid to be cooled is controlled by the Digital Controller. Some safety devices, such as pressure switches, digital controller & circuit fault indicators, are shown in the attached electrical diagram.

Section 4 - Receiving and Unpacking

It is necessary to use proper lifting and moving equipment with appropriate load capacity for this equipment. This unit can be lifted using either the base of the unit or customer supplied eyebolts. Lifting of this unit should be done by qualified individuals, using proper lifting equipment and standard practices. All standard safety procedures should be adhered to and followed. Avoid sudden movements, which can damage the framework and the internal components. See unit data label for unit weight.

Section 5 - Locating the Equipment

Place the equipment in a well-ventilated area, protected from any possible environmental containments (Sand, liquids, dust, etc.), and away from all heat sources, including direct sunlight. Outdoor units should also be protected from snow buildup and/or falling ice damage. If possible, place near the user system, in order to avoid load losses along the hydraulic connection pipes. This is an open process system. Be sure all necessary piping specialties, especially air vents and valve are used accordingly. For manufacturer recommendations, see the enclosed hydraulic plan.

Based on the environmental conditions, during the operation of this equipment, it is possible for the internal components to produce surface condensation or "sweat." It is recommended the unit be installed in an area where residual water can be controlled.

Section 6 - Foundation

The equipment should be placed on a solid base, and properly anchored to supporting structure. It should be located such that there is sufficient room for proper servicing of the unit. Care should also be taken to allow for proper airflow around the front, back and bottom of unit

After the final positioning of the equipment, inspect the internal connections for any damage that may have occurred during transport.

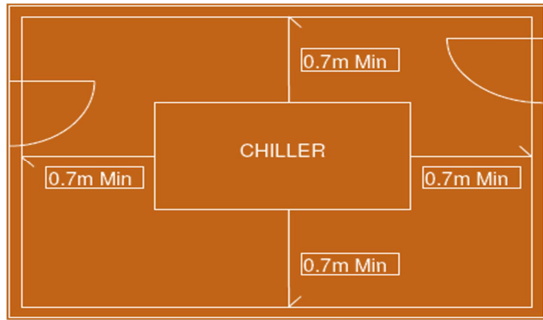


Figure 1 - Minimum Clearances

Section 7 - Connections

Important - Hydraulic (fluid) connections should be assembled first, followed by electrical connections.

Hydraulic Connections:

Please refer to the enclosed hydraulic plan. The flow rate and the fluid circulation direction must be respected during connection in accordance with INLET-OUTLET identification plates.

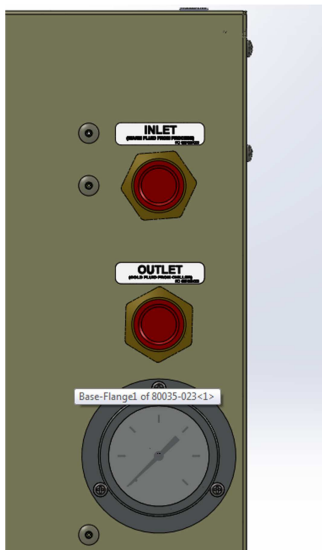


Figure 2 - Hydraulic connection points

If supply and return lines are overhead, the fluid in the piping may drain back and overflow the equipment reservoir if the equipment is shut down. This can be prevented by using a check valve in the supply line and/or a solenoid valve on the return line. Contact Pfannenberg service department if you have any questions.

Electric connections:

The unit must be electrically connected by the customer. Note, however, that electrical installation must respect all valid safety standards. It's advisable to install a circuit breaker cutout, upstream of the power cable. Make sure the system is adequately grounded. Check that the voltage and frequency of the power supply correspond to the specifications on the unit's data label and/or enclosed electrical plan.

Part # 885501061

Voltage Limitations: -

See Equipment Data Label for Correct Voltage

Unit Nameplate – CC6601, CC6501, CC6401
460V/60Hz/3Ph – (+/-5%, 437V to 483V)

Unit Nameplate – (@230v) CC6301, CC6201, CC6101
230V/60Hz/1Ph – (+/-5%, 218V to 242V)

Unit Nameplate – (@115v) CC6301, CC6201, CC6101
115V/60Hz/1Ph – (+/-5%, 110V to 121V)

Section 8 – Process water / fluids

NOTE: Consult a local water treatment professional who can provide information regarding water treatment options & requirements

Do NOT use automotive antifreeze! Use only (Ethylene or Propylene) glycol designed for commercial heating and cooling applications. The inhibitors used in automotive antifreeze can break down quickly and accelerate the degradation of the coolant base (glycol); as well as promote corrosion in a system. Silicates used in automotive antifreeze coat heat exchangers, resulting in reduced heat transfer. Also, silicates can gel, causing fouling and plugging of a system.

Pfannenberg recommends the fluid used in all cooling equipment to be a minimum of **20% glycol solution** for both freeze and corrosion protection of system components. Additionally distilled water is recommended because many municipal water supplies contain large amounts of chlorine, which can react unfavorably with glycol.

Freeze Protection:

The ratio of inhibited glycol to water should be adequate to prevent freezing at the lowest operating leaving water temperature **plus** a safety factor of 15 degrees Fahrenheit. The glycol solution will protect the equipment during operation, during shutdown and/or pump failure. Please see the technical data of the unit

Corrosion protection:

Glycol manufacturers may include various rust and algae inhibitors for use in cooling equipment. These additives will protect the equipment components and fluid circuit from adverse hydraulic effects. Consult the glycol manufactures technical information, or a water treatment professional to ensure correct inhibitors are contained in the chosen glycol solution.

Note:

The concentration of glycol solution, will affect the capacity of the cooling equipment. Contact Pfannenberg service if you have any questions.

Water Quality

The hydraulic circuit of this equipment is an open circuit. The system water levels will fluctuate based on operating and environmental conditions. Water levels should be checked daily by the equipment operator.

Check concentration levels with entire system filled and flow has been established. Prior to testing levels, allow system to run for about 15 minutes to adequately mix the fluid.

As part of periodic equipment maintenance plane, the glycol mixture should be checked (**every 3 to 6 months**) for proper concentrations. When filling the system, always use a pre-mixed solution in the proper ratio to maintain freeze and corrosion protection.

When filling hydraulic circuit, please consider the following:

Do not use deionized water.

Do not allow mechanical contamination to get in the water. Use water filters if this could be a problem.

Water hardness should not be too high. (See below)

Watch for chemical contamination.

Do not allow biological, bacteria, and algae contamination.

Minimum Water Quality Levels:

Fresh water from the tap, free of contamination
Ph.-level: 7 - 9
Hardness: <5 °dH
Conduction: <50µS/cm
Chloride: <20 mg/l

Section 9 - Ambient temperature

This cooling equipment is designed to operate within an indoor / outdoor environment. Ambient temperatures should be between 95°F (32°C) and 32°F (0°C.) Unit may not function properly if ambient temperature exceeds the recommended values.

Contact Pfannenberg service department with any questions regarding the ambient temperature operation.

Section 10 - Startup of the equipment

Note:

ALL ELECTRICAL AND HYDRAULIC CONNECTIONS SHOULD BE PERFORMED BY PERSONS CERTIFIED AND/OR KNOWLEDGEABLE IN THESE AREAS OF EXPERTISE.

Turn main electrical switch and all circuit breakers to the OFF position.

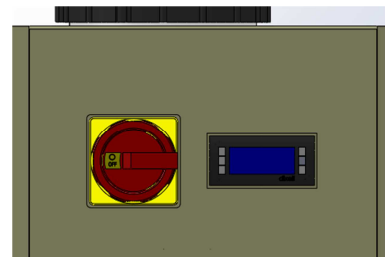


Figure 3 - Unit Disconnect & Controller

Check the internal hydraulic connections (clamps and fittings) that may loosen during transportation.

Connect process piping to equipment inlet/outlet connections.

Remove fill cap (large black cap) from top of the unit. Fill unit tank with glycol mixture until tank indicator registers the maximum level.

Reinstall tank cap.

Check the external hydraulic connections (clamps and fittings) and ensure correct hoses are connected – See hydraulic schematic for correct locations

Remove equipment cover bolts and aluminum side panels. Use **ONLY** manual tools to remove attachment screws.

Equipment power feed cable should be routed through cabinet knockout and connected to appropriate terminals – See electrical schematic

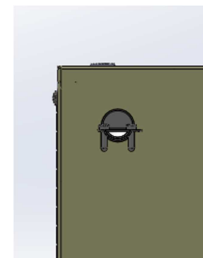


Figure 4 - Electrical Connection

Confirm unit disconnect switch is in OFF position.

Turn on main electrical supply at circuit breaker panel

Turn equipment disconnect to ON position. Unit display will display current fluid setpoint (Lower amber) and current fluid temperature (upper red.)

Confirm pump is running and water flowing by observing the return fluid is returning to the tank.

Perform a second visual inspection of the hydraulic circuit and all connections to check for leaks.

While water circuit is running make sure proper fluid level is maintained and if necessary fill reservoir to the proper level. Remove all air from system.

Replace equipment cover and mounting screws.

To adjust fluid setpoint - see attached controller information

After installation, the equipment does not need intervention to run properly as designed

All calibration operations on controllers, pressure switches and the components of the refrigerating circuit shall only be made by a qualified Technician

Contact Pfannenberg service with any questions or concerns

Section 11 – Maintenance

Only to be performed by qualified and trained personnel

Prior to performing equipment maintenance disconnect the supply voltage at the main circuit breaker and use proper lock out / tag out procedures for electrical protection

Proper testing and periodic checks will extend the life of the equipment, and help avoid possible breakdowns.

Check the mechanical workings of the compressor. The absence of metallic vibrations and a temperature between +20°C and +70°C, measured on the compressor head during running, show a regular working of the compressor.

Inspect the equipment condenser coil. The fins of the condenser must not have any dust deposits or damage.

Check the operation of the condenser fan.

Check the electrical alarm systems and controls.

Check the system fluid level. If the system is filled with a glycol-mix, refill only with the same mix.

Prolonged inactivity of the equipment requires draining of the tank and complete water circuit.

If the equipment is equipped with a filter on the hydraulic side, the filter has to be checked/cleaned monthly, or, if required in a shorter time interval

Section 12 – Troubleshooting

The information shown in this table is designed for the refrigeration service personal. The faults that require the intervention of a refrigeration engineer must be carried out only by specialized staff. Follow all electrical regulations when working on the unit, based on valid laws of the countries were the unit is placed.

Equipment		
Problem	Cause	Possible corrective Action
The unit does not start up	No supply voltage	Check the supply main voltage line
	Not working thermostat	Inspect the connection, check and correct the parameter settings and if there is no fault, replace the thermostat,
	The compressor protector (KLIXON) has switched off	Important: After the shut-down of the compressor, the resetting time will vary, depending on the environment of the compressor: In a hot, closed environment it will be 2 hours, in ventilated 1 hour. Note: The compressors are protected against high temperatures and currents, with an internal or external device. The internal/external device protects the compressor against the following situations: <ul style="list-style-type: none"> • overheating due to an inadequate cooling of the compressor motor. • Blocked compressor due to a high temperature of the motor or a high current. • Loose connections which may cause high currents
It works, but does not cool	There is not enough gas in the equipment	Service by a refrigeration engineer
	Faulty thermostatic valve	Service by a refrigeration engineer
	Too high heat load	Possible wrong application, Contact Pfannenberg
Refrigerant Cycle is not working		
Problem	Cause	Possible corrective Action
Switching of the pressure switch (high pressure side) – A01 code	The unit does not work. The causes are:	
	• Dirty condenser	Clean the condenser with compressed air if it is full of dust
	• The fan is broken	Replace the fan
	• Too high ambient temperature	Check that the equipment is located in a place that can guarantee suitable ventilation of the refrigerating unit. Check also that the ambient temperature does not exceed +27.7°C
Compressor		
Problem	Cause	Possible corrective Action
The compressor works continuously and the equipment can't control the liquid temperature: - too low temperature of the liquid - too high temperature of the liquid		
Too low temperature	Broken thermostat (contact blocked)	Replace the thermostat
Too high temperature	Broken thermostat	Replace the thermostat
	Not enough refrigerant in the unit	Service by a refrigeration engineer
	Too high heat load	Possible wrong application, Contact Pfannenberg

