



**Dedicated Chillers**

Heat Removal/Environmental Control

## PACKAGED FLUID COOLING FOR FAIL-SAFE PROTECTION OF CRITICAL APPLICATIONS



*Provides A Dependable Source Of  
Chilled Water For A Variety  
Of Heat-Generating Medical  
And Industrial Equipment*



# KEEPING THINGS COOL AND PRODUCTIVE

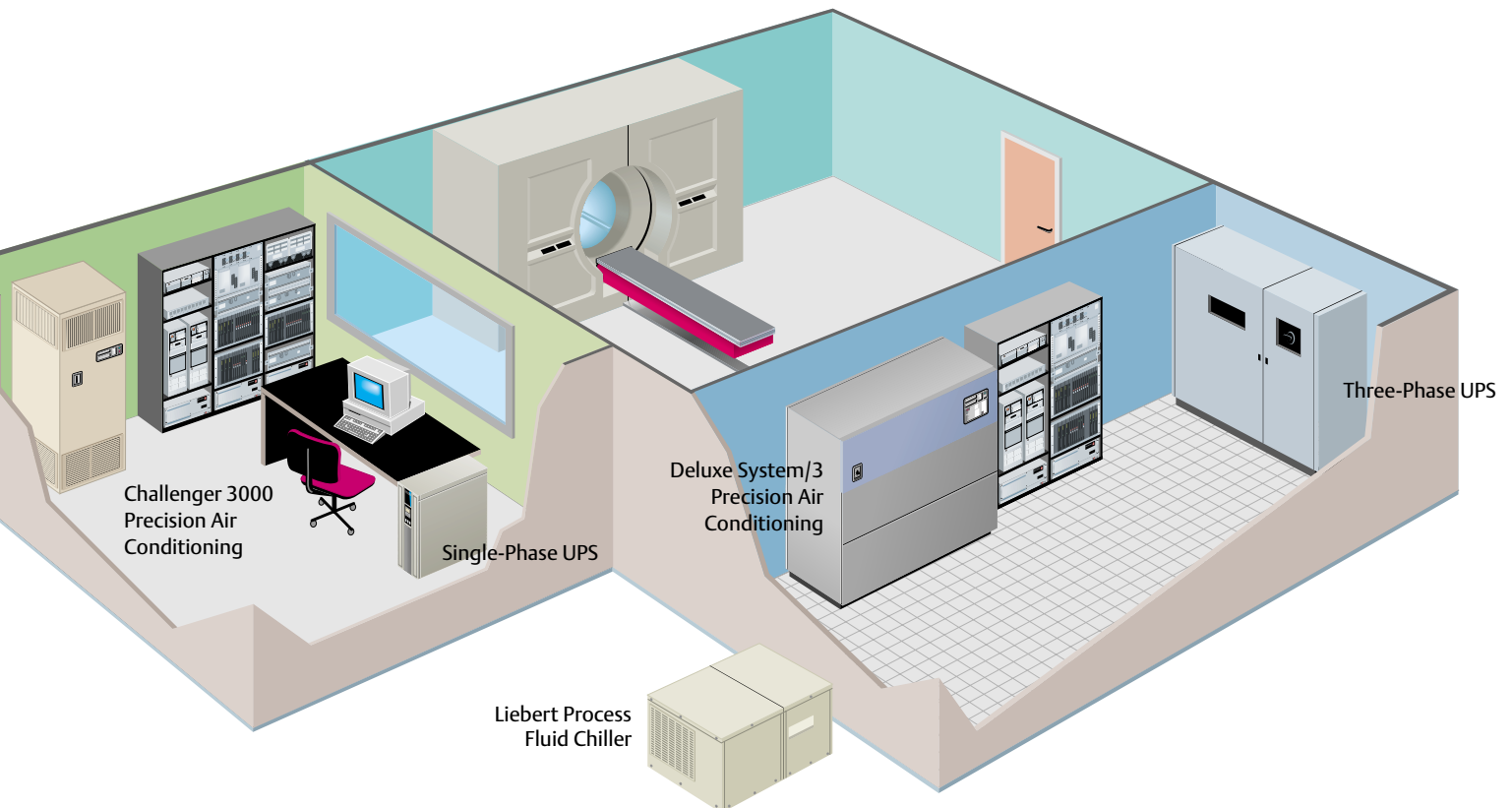
Protecting your water-cooled equipment with a central building chiller can get you into hot water. Here's why.

Many process control systems come with a built-in fluid cooler, ready for connection to an outside source of coolant. That source needs to be available whenever the system is operating, and most are designed to operate around the clock. For that reason, it is unwise to connect critical equipment controls to ordinary building air conditioners.

## Critical Equipment Needs Much More

Water-cooled systems rely on a continuous supply of liquid coolant to maintain process temperature within a specified range. Exceeding temperature specification or an interruption of coolant flow can cause sudden shut-down, interruption of operations, not to mention possible damage resulting in costly repairs and downtime. On top of that, restarts following such a stoppage are often time-consuming and expensive.

Central plant chillers were designed to provide cooling fluid for building air conditioners and other seasonal, heat-producing equipment. But what's good for the building air conditioner isn't necessarily good for an MRI or other sensitive piece of equipment. Fluid temperatures and flow rates are not designed for these types of medical and industrial systems. In addition, building chillers recirculate water through pipes and components that don't meet the cleanliness requirements of critical equipment. And, the building chiller may be cycled off, while your medical or process equipment needs to operate all year.



# Liebert Has The Solution: Dedicated Chillers



Water cooled electronic equipment has special needs beyond cool water. Sensitive equipment requires year-round operation, precise temperature-regulated water flow and a clean circulating loop – features only available with an equipment-matched, factory-tested, dedicated chiller.

For reliability when selecting a chiller, look for a packaged, pre-tested system to ensure proper operation, indoor or outdoor installation, factory piping, charging and wiring to minimize installation time or confusion; and local representation for quick service response.

Liebert chillers do this by providing dedicated, capacity-matched cooling, proper temperature and waterflow, and year-round operation for a wide variety of water cooled medical and industrial equipment.

Use of a dedicated chiller is also more efficient. Cooling requirements can be met during periods of low outside temperature without the extra expense of operating a large facility chiller. And installation is simple. Liebert chillers can be supplied with plug-in hose connections and pre-charged refrigeration circuits.

Other advantages include:

- Precise temperature control and a continuous supply of cooling fluid.
- Factory-tested, piped, wired and charged for hassle-free startup and operation.
- Local service and parts for quick and knowledgeable maintenance and service.

## From The Recognized Leader In Critical Support Systems

No one knows more about precision cooling than Liebert. After all we invented it back in 1965. Our precision cooling technology has been proven in thousands of critical data centers and other facilities around the world.

Liebert's broad product line gives us the unique ability to create a "tailored solution" that will meet your protection needs precisely and efficiently. We don't have to take the one or two items we happen to have and stretch them to come up with the answer. We give you the best answer every time.

# WHATEVER YOUR APPLICATION, THERE IS A LIEBERT CHILLER TO MEET THE NEED

From precise medical diagnostic systems to machinery out on the plant floor, many pieces of medical and process equipment have unique needs for fluid cooling. Only Liebert has the expertise and technology to meet your dedicated chiller needs exactly, no matter what the application.

## Medical Systems

High investment diagnostic tools and other fluid cooled medical equipment rely on the cooling fluid provided by a chiller to maintain operation and to avoid damage from overheating. Liebert chillers provide dedicated, capacity-matched cooling and manufacturer compatibility for sensitive medical equipment including:

- CT
- MRI
- PET
- Linear Accelerators
- CGR and RDS cyclotron
- Electron Microscopes
- Gas Chromatograph
- Cryogenic Compressors
- Other Sensitive Medical Systems

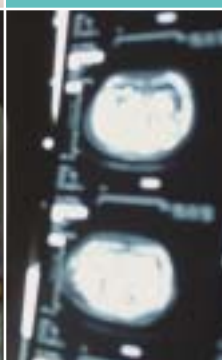
The Liebert Process Fluid Chiller provides the reliability critical medical systems demand:

**Designed for reliability** — 24 x 7 operation.

**Low ambient capability** — Designed for indoor or outdoor installation.

**Non-ferrous cooling loop** — Provides cleanliness required by sensitive medical equipment.

**Emergency water switchover module** — Transfers to separate water supply in case of flow or temperature problems.





## Industrial Equipment

Despite the rugged appearance of industrial machinery, it is actually very sensitive to fluctuations in temperature especially fluid cooled process equipment. When your manufacturing equipment is down, so are your profits. These systems demand a continuous supply of cooling fluid — or the results could be downtime and expensive repairs due to equipment failure, component damage and lost production.

Liebert chillers provide capacity-matched cooling, proper temperature and waterflow, plus year-round operation required by industrial equipment and processes such as:

- Plastics Molding and Extrusion
- Water Jacketed Machinery
- Metal Working and Plating
- Chemical Processes
- Laser Welding & Cutting
- Distillation Processes
- Vapor Degreasers
- Power Supplies
- Power Transformers
- Air/Gas Compressors
- Computers and Semiconductors
- Vacuum Systems and Evaporators
- Induction Furnaces
- Pharmaceutical Batch Processors
- Food and Beverage Processes
- Micro Breweries
- Wineries
- Film Processing
- Any Water Cooled Load up to 10 Tons

The Liebert Process Fluid Chiller provides the reliability industrial systems demand:

**Rugged design** — Durable enough for outdoor use, yet quiet enough for factory floor operation.

**Designed for reliability** — 24 x 7 operation.

**Low ambient capability** — Designed for indoor or outdoor installation.

**Factory-tested** — Piped, wired and charged for hassle-free startup and operation.



# PROCESS FLUID CHILLERS: PACKAGED, PRECISE FLUID COOLING FOR MEDICAL AND INDUSTRIAL EQUIPMENT

The Liebert Process Fluid Chiller is designed to cool sensitive medical and industrial process equipment, meeting or exceeding all manufacturers' specifications for cooling capacity, and fluid-flow rates.

Liebert Process Fluid Chillers are specifically matched to the application to provide the proper temperature and flow rate for a variety of sensitive electronic systems. These dedicated chillers are tested at the factory to ensure proper operation and are supported by factory-trained experts with immediate access to common spare parts. In addition, the Process Fluid Chiller is easy to install, requiring only final piping and wiring connections for proper operation.

These units feature a rugged design, durable enough for outside — yet quiet enough for indoor cleanroom or factory floor operation. Built-in quality, along with Liebert's leadership role in supporting critical electronic systems, make the Process Fluid Chiller the logical choice to support your water-cooled equipment.

Liebert Process Fluid Chillers are designed to cool sensitive medical and process equipment, meeting the specifications of medical and industrial equipment manufacturers. Operational features include:

**Year-round operation** — Allows your equipment to run when you need it, not just when your building chiller is available.

**Capacity and fluid flow rates matched to your system** — Meets the varied needs of resting and active modes of operation. Provides chilled water from 40 to 70°F (4.4 to 21°C).

**Non-ferrous circulating loop for cleanliness** — Delivers a clean supply of water that won't disrupt sensitive equipment.

**Precision temperature control** — An electronic hot gas bypass, which balances varying heat loads and provides precise control, is standard on all 8 and 10-ton Process Fluid Chillers. This new feature significantly reduces start-up time for chiller applications and offers better reaction to varying loads. The electronic hot gas bypass will automatically adjust as the load changes. It can minimize compressor cycling, which will help to reduce temperature swings and lessen component wear.

**Factory packaged, tested system** — Wired, charged and piped. Proven operation before installation.

**Designed for indoor or outdoor installation** — The system cabinet and components are rugged enough for outdoor installation. Also compact and quiet enough for in-the-building installation. Operates at ambients of -30 to 115°F (-34.4 to 46°C).

**Efficient operation** — High efficiency heat exchangers provide energy efficient operation, as well as precise cooling.

**Tamper-proof design** — Controls are secured inside the enclosure, so cooling parameters can't be accidentally changed.

**NRTL-approved** — Unlike built-up systems, Liebert Process Fluid Chillers are shipped with NRTL certification (Nationally Recognized Testing Laboratory), allowing fast, hassle-free inspection and building code approvals.



The Liebert Process Fluid Chiller easily connects to your load-side supply and return connections, to provide a reliable, dedicated chilled water source for industrial equipment.



## System Accessories (Field Installable)

**Emergency Water Switchover module** — Automatically switches operation to a separate water supply in case of flow or temperature problems.

**Water Level Control and alarm system** — Automatically adds water to the thermal storage reservoir when the water level drops below a preset level.

**Optional monitoring systems** — LED display indicates alarm conditions for system parameters.

### Other accessories available

- Fluid pressure gauge.
- Check valve.
- Dial thermometer.
- Relief valve.
- Circuit setter.
- Ball valve.
- High temperature thermostat.
- Low flow switch.

## Features

**Hermetic compressor** — Offers efficient and reliable operation.

**Refrigerant dehydrator** — Absorbs moisture contamination.

**Expansion valve** — Controls refrigerant flow and superheat.

**Refrigerant receiver** — For liquid seal and refrigerant storage.

**Stainless steel fluid reservoir expansion tank** — Acts as a buffer for rapid load changes.

**Pressure relief valves** — For water and refrigerant regulation.

**Stainless steel pump** — Provides a clean, non-ferrous circulating loop for sensitive electronic systems.

## Optional Features

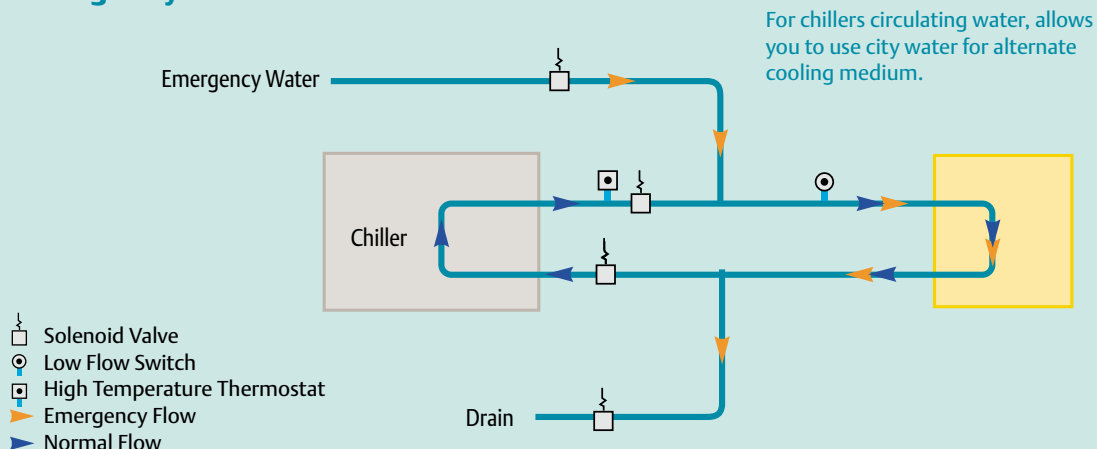
**Refrigerant gauges** — Continuously monitor and display suction and discharge refrigerant pressures.

**Reservoir heater** — Maintains fluid reservoir temperature during winter months.



Liebert monitors provide continuous supervision of up to 8 critical alarm conditions.

## Emergency Water Switchover



# CSU3000™ CHILLER: HIGH-CAPACITY, CONSTANT PROTECTION FOR WATER-COOLED EQUIPMENT

The Liebert CSU3000 is designed for reliability and precision to meet the needs of water-cooled industrial and medical equipment. Multiple independent chiller modules with automatic switchover provide 100% back-up in the unlikely event of a failure in the primary module. As a result, no single component failure will interrupt operation.

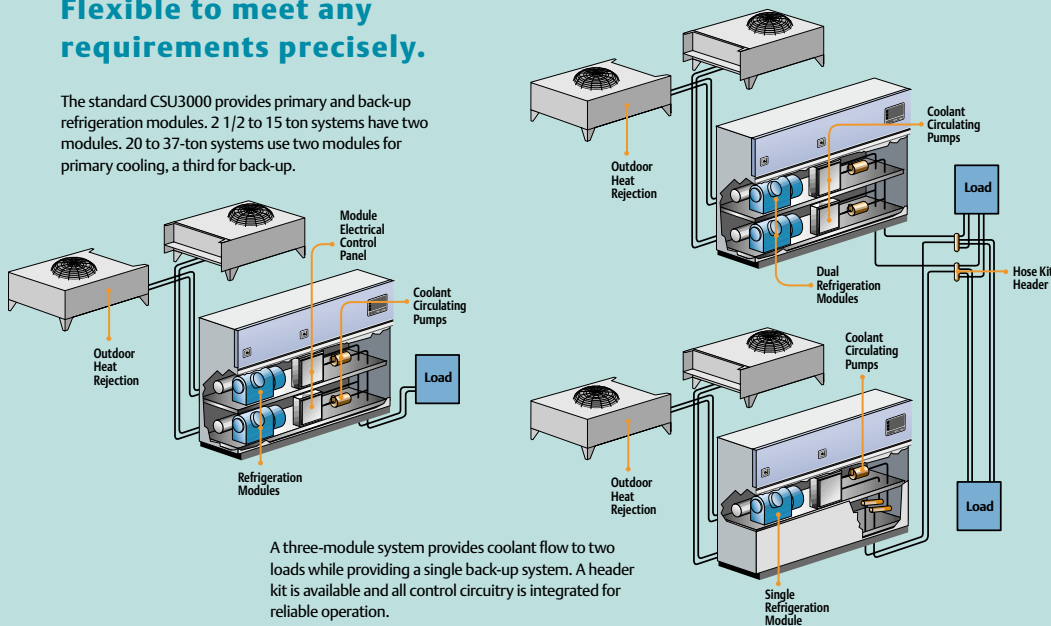
The CSU3000's close-coupled, closed loop system supplies cleaner coolant to the system, reducing the fouling factor. And, in case of expansion, the CSU3000 has the capability to be easily upgraded to increase cooling capacity. The CSU3000 is available in both dual and triple capacity models, allowing precise cooling over a wide range of heat loads.

The pre-packaged system features indoor cabinet construction and is easy to install, and front access simplifies service. Units are available in single, dual and triple capacity models.

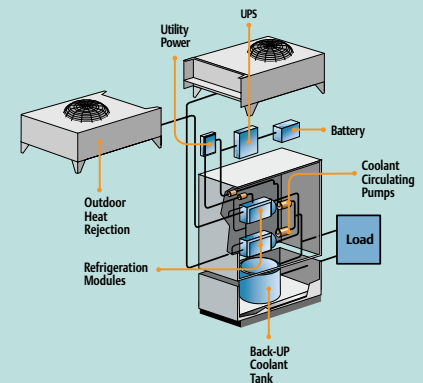
Desirable Feature	Building Chiller	Liebert CSU3000
Full Redundancy	No.	Yes. 100% with automatic switchover.
Easy Installation	Doubtful. Piping, pumping and control may require special design.	Yes. Flexible plug-compatible hose connections to CDU.
Efficiency	Usually not. Chiller capacity probably is far in excess of computer needs, making operation of the chiller inefficient during some periods.	Yes. Highest EER in the industry.
Monitoring	Not available.	Yes. Local and Optional Remote.
Proven Design	Tapping into building chillers with needed controls is typically a "first-time" approach.	Yes. Factory-assembled and tested.
Easy expansion	Difficult. Redesign and resizing of pumping equipment required.	Yes. Dual capacity increases cooling capacity at the touch of a button.
Precise Control of Flow and Temperature	More difficult. Piping length and fittings can introduce transport lag.	Yes. Integral Control System.

## Flexible to meet any requirements precisely.

The standard CSU3000 provides primary and back-up refrigeration modules. 2 1/2 to 15 ton systems have two modules. 20 to 37-ton systems use two modules for primary cooling, a third for back-up.



**Protection in case of power outage.** A back-up coolant tank and a Dual Pump Power Connection can be specified. The circulating pumps, powered by the computer room's UPS system, maintain coolant flow during a power outage.





# Built For Efficiency, Flexibility and Reliability



The advantages of the Liebert CSU3000 make it the best choice for meeting the cooling requirements of your sensitive water-cooled equipment.

**Energy Efficiency** — Exclusive semi-hermetic compressor design is more efficient than conventional hermetic compressors. An optional GLYCOOL model is available for even more energy savings.

**Application Flexibility** — Liebert chillers are available in a variety of sizes (from 2.5 to 37-ton capacities) and configurations to match your unique requirements.

**Refrigeration System** — The CSU3000 utilizes a rugged, reliable semi-hermetic compressor with a service life more than four times as long as its hermetic counterparts — plus the highest energy efficiency ratio in the industry (11.7 EER).

**Dual/Triple-Capacity Control** — All models can be equipped with capacity control that enables the chiller to increase or decrease its cooling capacity as needs change.

**Coolant Supply System** — The CSU3000 can be connected to the load by means of flexible, insulated hoses that simplify the relocation of equipment.

**Precise temperature control** — An electronic hot gas bypass, which balances varying heat loads and provides exact control, is standard on all CSU3000 chillers. This new feature significantly reduces start-up time for chiller applications and offers better reaction to varying loads. The electronic hot gas bypass will automatically adjust as the load changes, minimizing compressor cycling, which will help to reduce temperature swings and lessen component wear.

**Heavy-duty pump, water temperature sensors** — Provide continuous, precise temperature control to the critical load.

**Full System Redundancy** — For uncommon reliability, Liebert CSU3000 chillers contain multiple, totally independent cooling units with automatic switchover in the unlikely event of any failure.

**Optional AWS (Alternate Water Source) Configuration** — Takes advantage of an existing building chilled water loop without being dependent on its availability or sacrificing water cleanliness to the critical load.

## Status Communication

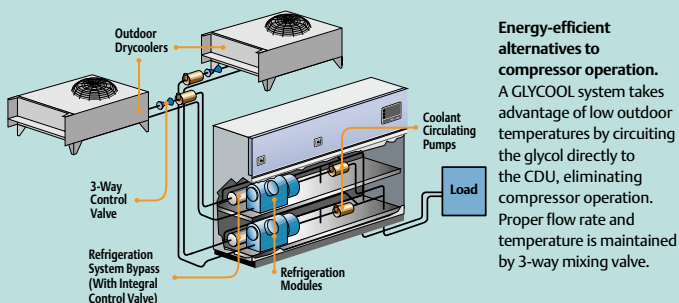
The PCR3000 is a solidstate monitoring and alarm system that continuously monitors the operation of the coolant supply unit. A backlit readout panel displays both operation mode and any alarm condition. It features a manual start/stop switch for each module and a silence switch that will quiet the audible alarm. The PCR3000 also provides connection points for the entire control system that eliminates "hand-wired" connections and assures greater reliability.

**Security** — Maintaining a constant watch over the system, the exclusive Sentinel 3000 is a solidstate alarm module that warns operation personnel audibly and visually of any alarm condition.

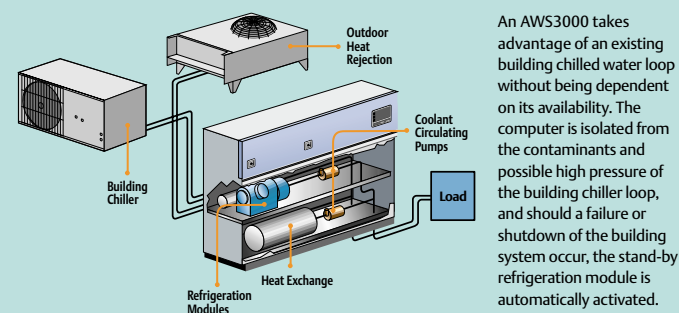
**Notification** — During a malfunction, the Sentinel 3000 automatically deactivates the primary chiller module and energizes the stand-by module, continuing the flow of coolant to the equipment. The audible alarm may be silenced, but the visual indicator remains lit until the problem is corrected. To aid in troubleshooting, the nature of the malfunction is described on the readout panel.

**Alarm Indication** — In addition to the specific alarm message, a common alarm message such as "call for service" may be specified and a common alarm output for alarm indication at a remote location.

**SiteScan® Compatibility** — The CSU3000 can be equipped with an information gathering module that can transmit status, alarm and other data to a Liebert SiteScan centralized monitoring system. This helps you keep informed and in control of this vital support function and document system performance.



**Energy-efficient alternatives to compressor operation.** A GLYCOOL system takes advantage of low outdoor temperatures by circuiting the glycol directly to the CDU, eliminating compressor operation. Proper flow rate and temperature is maintained by 3-way mixing valve.



An AWS3000 takes advantage of an existing building chilled water loop without being dependent on its availability. The computer is isolated from the contaminants and possible high pressure of the building chiller loop, and should a failure or shutdown of the building system occur, the stand-by refrigeration module is automatically activated.

# PROCESS FLUID CHILLER SPECIFICATIONS

## Process Fluid Chiller – 60 Hz

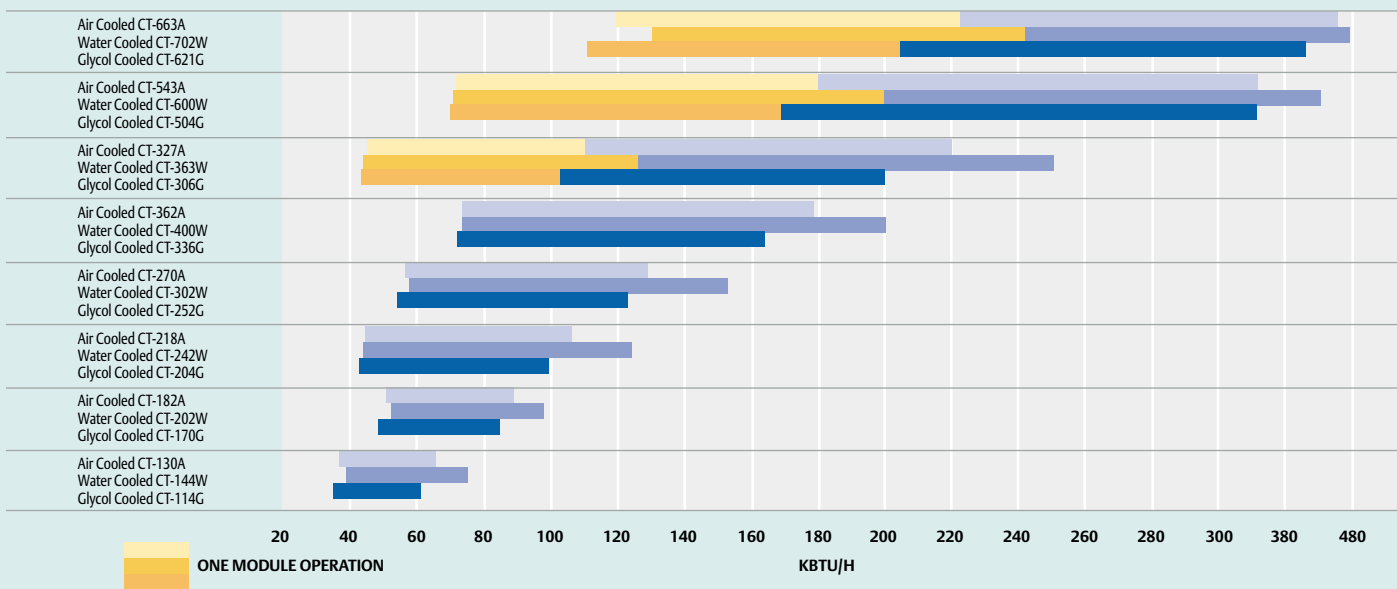
Model	PS018A	PS024A	PS036A	PS048A	PS060A	PS096A	PS120A
Flow Rate GPM (L/S)	2.4 (0.15)	3.3 (0.21)	5.3 (0.33)	7.9 (0.49)	10.2 (0.64)	16 (1.01)	20 (1.26)
<b>Water</b>							
Pressure Drop PSI (kPa)	5.8 (39.8)	10.8 (74.1)	4.3 (29.5)	8.1 (55.6)	13.3 (91.3)	8.1 (55.8)	13.2 (91.0)
Net Cooling Capacity BTUH (kW)							
45°F (7.2°C) LWT	11700 (3.4)	15700 (4.9)	26700 (7.8)	39300 (11.5)	51200 (15.0)	77200 (22.6)	91600 (26.8)
50°F (10°C) LWT	13200 (3.9)	19200 (5.6)	29400 (8.6)	42500 (12.5)	57400 (16.8)	83600 (24.5)	102400 (30.0)
55°F (12.8°C) LWT	14700 (4.3)	21600 (6.3)	32500 (9.5)	45900 (13.5)	63500 (18.6)	90400 (26.5)	113000 (33.1)
60°F (15.6°C) LWT	16100 (4.7)	24000 (7.0)	35800 (10.5)	49600 (14.5)	69200 (20.3)	97600 (28.6)	122600 (35.9)
<b>40% Propylene Glycol</b>							
Pressure Drop PSI (kPa)	8.2 (56.0)	15.0 (102.8)	5.9 (40.8)	10.9 (74.8)	17.8 (122.1)	13 (89.6)	17.6 (121.4)
Net Cooling Capacity BTUH (kW)							
45°F (7.2°C) LWT	9900 (2.9)	15400 (4.5)	23700 (6.9)	36300 (10.6)	47100 (13.8)	71200 (20.8)	84700 (24.8)
50°F (10°C) LWT	11200 (3.3)	17500 (5.1)	26300 (7.7)	39600 (11.6)	54200 (15.9)	77800 (22.8)	92600 (27.1)
55°F (12.8°C) LWT	12700 (3.7)	19500 (5.7)	29500 (8.6)	43100 (12.6)	59100 (17.3)	84800 (24.8)	104000 (30.5)
60°F (15.6°C) LWT	14200 (4.2)	21500 (6.3)	32400 (9.5)	48800 (14.3)	64000 (18.8)	96200 (28.2)	114000 (33.4)
<b>40% Propylene Glycol</b>							
Pressure Drop PSI (kPa)	9.9 (67.6)	18.0 (155.7)	7.0 (48.3)	8.1 (55.6)	20.8 (142.7)	13.4 (92.4)	20.5 (141.3)
Net Cooling Capacity BTUH (kW)							
45°F (7.2°C) LWT	9000 (2.6)	14400 (4.2)	22300 (6.5)	34400 (10.1)	45000 (13.18)	67400 (18.7)	80600 (23.6)
50°F (10°C) LWT	10400 (3.1)	16000 (4.7)	25100 (7.4)	37800 (11.1)	49600 (14.5)	74400 (21.8)	88500 (25.9)
55°F (12.8°C) LWT	11700 (3.4)	18200 (5.3)	27900 (8.2)	41400 (12.1)	54200 (15.9)	81600 (23.9)	96800 (28.3)
60°F (15.6°C) LWT	13200 (3.9)	20200 (5.9)	31100 (9.1)	45100 (13.2)	59200 (17.4)	88800 (26.0)	105400 (30.9)

## Process Fluid Chiller – 50 Hz

Model	PS021A	PS028A	PS038A	PS047A	PS059A
Flow Rate GPM (L/S)	2.5 (0.16)	3.7 (0.23)	5.1 (0.32)	7.9 (0.50) 8.3 (0.52)	
<b>Water</b>					
Pressure Drop PSI (kPa)	6.1 (42.1)	12.3 (84.6)	4.9 (33.5)	8.1 (55.6)	10.2 (70.2)
Net Cooling Capacity BTUH (kW)					
45°F (7.2°C) LWT	12500 (3.7)	18300 (5.4)	25400 (7.4)	39800 (11.7)	41400 (12.1)
50°F (10.0°C) LWT	14000 (4.1)	20900 (6.1)	28100 (8.2)	43300 (12.7)	46700 (13.7)
55°F (12.8°C) LWT	15400 (4.5)	23400 (6.9)	30900 (9.0)	47000 (13.8)	51900 (15.2)
60°F (15.6°C) LWT	16700 (4.9)	26000 (7.6)	33900 (9.9)	51300 (15.0)	56700 (16.6)
<b>40% Propylene Glycol</b>					
Pressure Drop PSI (kPa)	8.7 (60.1)	17.2 (118.4)	6.7 (46.3)	11.1 (76.2)	14.0 (96.2)
Net Cooling Capacity BTUH (kW)					
45°F (7.2°C) LWT	11500 (3.4)	18100 (5.3)	23000 (6.7)	36600 (10.7)	38000 (11.1)
50°F (10.0°C) LWT	13000 (3.8)	20100 (5.9)	25500 (7.5)	40300 (11.8)	41800 (12.2)
55°F (12.8°C) LWT	14500 (4.2)	23400 (6.9)	28100 (8.2)	44000 (12.9)	45700 (13.4)
60°F (15.6°C) LWT	15900 (4.7)	26100 (7.6)	30900 (9.0)	50400 (14.8)	52100 (15.3)
<b>40% Propylene Glycol</b>					
Pressure Drop PSI (kPa)	10.8 (74.4)	21.0 (144.7)	8.1 (55.9)	13.2 (91.2)	16.6 (114.8)
Net Cooling Capacity BTUH (kW)					
45°F (7.2°C) LWT	10800 (3.2)	17300 (5.1)	21700 (6.4)	34700 (10.2)	36200 (10.6)
50°F (10.0°C) LWT	12300 (3.6)	19400 (5.7)	24200 (7.1)	38300 (11.2)	40100 (11.7)
55°F (12.8°C) LWT	13900 (4.1)	21500 (6.3)	26800 (7.8)	42000 (12.3)	44100 (12.9)
60°F (15.6°C) LWT	15400 (4.5)	23900 (7.0)	26600 (8.7)	46100 (13.5)	48200 (14.1)

# CSU3000 Chiller Specifications

## Heatload Cooling Capacity-KBTUH



Liebert CSU3000 chillers are available in a variety of configurations to meet application requirements. Sizes range from 2.5 to 37 tons in air, water and glycol cooled systems. Regardless of geographic location, ambient temperature or facility considerations, the CSU3000 offers models to enhance energy efficiency and to make use of existing water sources.

- **Model DS/DD, 2.5, 5 Ton, Air/Water/Glycol Cooled, Compressorized.** Compact model requiring only 11 sq. ft. (1m<sup>2</sup>) of floor space. Dual capacity is standard. A back-up coolant tank and UPS pump electrical connection can be provided.

- **Model CS/CD, 7.5, 10, 12, and 15 Ton, Air/Water/Glycol Cooled, Compressorized.** Full size model with capacities to 201,400 BTUH (59kw). dual capacity optional. GLYCOOL option and Alternate Water Source systems available.

- **Model CT, 20, 30 and 37 Ton, Air/Water/Glycol Cooled, Compressorized.** Three module systems with capacities to 485,500 BTUH (142kw). Triple-stage capacity systems available.

# TOTAL CONFIDENCE IN THE DECISION YOU'VE MADE.



## Dedicated Chillers

## Heat Removal/Environmental Control

No organization in the world today has a better understanding of exactly what it takes to keep critical information and industrial processes operating continuously than Liebert.

We are the only company in this business that maintains a strong local presence of Representatives, Distributors and Resellers. This resource, coupled with our broad product line, gives Liebert the ability to create a "tailored solution" that will meet your protection needs precisely and efficiently.

There are Liebert systems designed for nearly every application — from basic protection for network PCs, servers or point-of-sale terminals...to highly engineered systems for computer rooms, telecommunications centers, Internet hosting sites, colocation facilities and industrial control rooms. But no matter what the size or complexity, the availability of these critical electronic systems is Liebert's primary focus.

With your purchase of a Liebert product, you are buying into a company that stands behind its products. You are also aligning yourself with an organization that has a reputation for quality and reliability that is second to none.

After the sale, Liebert provides comprehensive support wherever and whenever it's needed, with the largest service organization in the industry.

In the systems protection business it's when you need someone to count on that you find out whether you've made the right choice. Liebert customers — many of them with us for over three decades — already know how good their decision was.

*The day your critical operations are threatened by excessive heat, power problems or other risks is no time to find out if a "simple" solution to system protection will work. Let Liebert help you make the smart decision about assuring reliability in your high availability facilities.*



That Is  
**The Liebert Experience**

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