



Our Comprehensive System approach includes:

- Total System Design Engineering
- Industrial quality chillers optimized to your application.
- Prefabricated piping, spools, and line insulation for quick connection of chilled water piping to inlet coils at your building.
- Power wiring as a single point connection for easy field connection.
- VFD options, as well as custom features and sizes.
- The packaged chiller unit meets and exceeds all of the aforementioned requirements while operating within energy consumption levels that offer significant increased power output of gas turbines with very short pay back periods. Depending on the operating times, kw costs, and type of gas turbine, total installed system pay backs can be only months.



PACKAGED Chilling Systems



Factory Manufactured Quality • Complete Chilling Plant • Single Lift

Factory Design, Manufacture and Testing: The Packaged Chilling System (PCS) is a completely self-contained refrigeration, pumping, control and switchgear, skidded unit with all components pre-piped, wired and requiring only power input and condenser/chilled water connections. The unit is factory fabricated in a module with weight and dimensions that can be readily transported to sites worldwide, indoors or out.

FEATURING:

- Simple packaged concept for easy installation
- Lower first cost (less expensive to build in factory)
- Eliminates indoor equipment rooms in new construction, meets ASHRAE 15 requirements
- High reliability thru redundancy of critical components, factory tested, (optional five-year P/L warranty)
- Easy access-serviceability
- Low maintenance
- Pre-engineered for fast delivery, small footprint
- Efficiency benefits of water cooled chillers with low kw/ton
- Environmentally friendly R-134a system refrigerant with no chlorine, refrigerant monitors, vents
- Options for different voltage/phase and environments (including explosion proof)

AVAILABLE IN SIZES FROM 20 - 2500 TONS



TISDALE MANUFACTURING
MODULAR HVAC & PLUMBING PACKAGES

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Heart of the PCS™

At the heart are heavy duty electric driven centrifugal compressors, chiller unit, complete with electronic controls starters, piping, safetys, and other devices to allow the chiller to operate safely, efficiently and reliably. Optional (duplex) two condenser and two chilled water pumps with full electrical switchgear, work as "one duty" and "one standby" for reliability in case of failure or periodic service on the pumps.

Since the pumps have separate starters and controls, they can safely be serviced, switched from "duty" to "standby" or "valved-out" and replaced.

The pumps, chiller, and water line specialties (flow setting valves, flow measurement, stop valves, check valves, gages, thermometers, etc.) are fully installed, welded, corrosion protected and insulated for severe duty.

Features of the System

- Lower first cost.
- Economy of operation when considering:
 - Energy costs
 - Maintenance costs, routine & major
 - Parts inventory costs
 - Flexibility of operation, full and part load.
- A complete packaged unit that is ready to connect and place in service within days.
- Packaged so that it can ship in 14-16 weeks from order.
- Capacity (up to 2500 tons) in a small, compact, lightweight and cost effective package.
- Flexibility of indoor or outdoor installation simplifies plant engineering design and can eliminate the cost of a chiller mechanical room when applied outdoors.
- Highly dependable motor/drive, compressors-, controls, and electrical switchgear with proven industrial components.
- Simplicity in design, concept, service, and parts utilizing recognized major brand name components.
- Optional duty/standby capability without cost penalty or size/weight restrictions.
- By designing components for your site conditions, we achieve lowest KW/ton available compared to "cataloged" products.

Why Packaged?

Factory packaging gives you the benefit of factory quality control, clean conditioned assembly areas, uniformity of construction, economics of factory labor, functional testing, and a product with prior proven performance. The complexities and problems of field assembled or field "built-up" systems are all too common. The cost savings in time alone comparing a field "built-up" system to a skidded package is dramatic. The com-



plete package can be shipped to your job site in as little as 14 to 16 weeks from your release to fabricate. Most field erected systems will consume this much time from order to receipt of the material on site with the actual erection time to be added. The economics, quality, quick delivery, and reliability of the packaged system are clear.

The entire unit is suitable for operation in tropical, fungal, hot, cold, and corrosive environments. The enclosure is fully weatherproof (urethane exterior/interior painting system), leak-tight, vermin and insect proof. The system can be serviced under the most severe conditions without critical components being exposed to the elements.

Access/space problems commonly encountered in retrofit applications can be eliminated by placing the modular unit outdoors. An outdoor unit is a solution for adding chiller capacity to a facility as well.

The smallest footprint in the industry eliminates need to locate the unit remote to areas served.



Prefabricated Piping

Some of the most expensive and time consuming aspects of a construction project in remote locations is the uncertainty of

weather, skill of local labor, and material availability. In the field, quality control, coordination of labor and materials are expensive. Pre-packaging and pre-piping of the entire chilled water and condenser water piping minimizes this expense. Only external connection to pipe flanges conveniently extended to the exterior of the skid is necessary. This can also be simplified through the use of pre-fabricated pipe spools for easy bolt-up field installation by non-technical personnel. Included in the pre-piped units are, typically:

- Pumps and motors.
- Check valves.
- Shut-off and balancing valves.
- Flow measuring ports and control valves.
- Pressure gages.
- Complete microprocessor control system to interface with customer
- Air bleed stations.
- Vibration/shock flex connectors.
- Make-up water connection.
- Expansion tank.
- Urethane corrosion protective finish.
- Easy four point lifting system.
- Special insulation on cold surfaces to prevent sweating of piping and heat exchangers.
- Enclosed in a lighted, weather- proof, and ventilated heat/ cooled package.

This all adds up to a fast, easy, and predictable installation.

Prewired Switchgear and Controls

Critical operating electrical switchgear is provided in a 100% duty and 100% standby configuration (duplex). Each redundant component can be changed out safely with the back-up component still in operation. Universally available switchgear is utilized for ease and economy of spare or emergency parts procurement. Customer preferred components can be provided, if desired. Each component has a fully thermal and current protected starter with a disconnecting molded case circuit breaker. The compressors are provided with an electronic monitoring and protection type starter package. Externally provided power is connected directly to the compressor starters from a protected feed.

All of the electrical systems, as with the piping system, are fully wired and tested in the factory under demanding Q.C. standards. The system is engineered for dependable operation for extended periods in severe conditions. No field wiring or assembly of the internal unit components is required. Conve-

nient electrical conduit gutter connections to the exterior are provided for connections to the unit's electrical terminals. With the open protocol, customer specific controls and logic are provided.

Redundant Pumps (Optional) in "Duplex" Model



Redundant critical components are an absolute necessity when reliability and performance is required. Industrial quality cast iron condenser and chilled water pumps can be provided in 100% duty and 100% standby configuration. These can be switched over or alternated or the unit can be configured for remote switch-over through a communications connection. Each piping circuit has all of the necessary redundant components for reliable operation. Pumps are industrial type, flex-coupled, with conventional frame motors for ease of removal and service. Since the pumps are inside and out of the weather, year-around service is not compromised. Low rpm (1800) for minimum wear, vibration, safety, and noise are prime factors in our pump selection.

