

- **Temperature Control Units**
Water & Oil
30° - 500°F

- **Portable Chillers**
Air & Water-Cooled
20° - 70°F

- **Central Chillers**
Air & Water-Cooled
Packages & Modules
20° - 70°F

- **Pump Tank Stations**
Chilled or Tower Water
200 - 3600 gallons

- **Cooling Tower Cells**
45 - 540 tons

- **Filters**

- **Heat Exchangers**

WARRANTY

- **1 Year:**
Covering parts and labor

- **2nd Year:**
Complementary visit for preventive maintenance consultation

TITAN® SERIES

- Complete Central Chiller & Pump Tank Package
- 20 to 70 Tons
- 20°F to 70°F



Titan® Series central chiller, model TI-60W shown with optional standby pump and manifold.

Water-Cooled and Air-Cooled Models



Titan® Series central chiller, Model TI-40W shown with integral 450 gallon pump tank and optional standby pump.

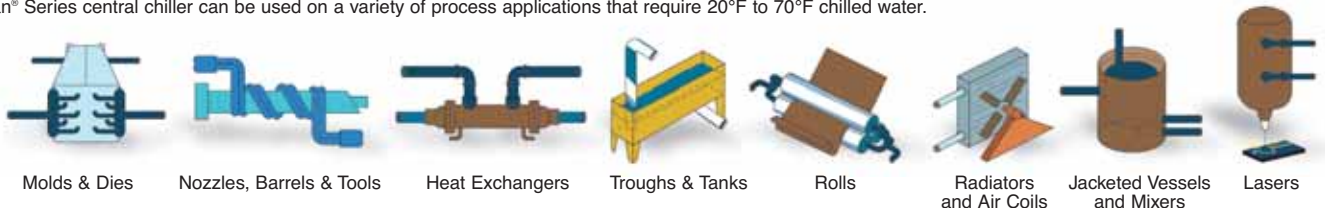
YOUR PROCESS DEMANDS THE MOST DEPENDABLE CENTRAL CHILLER AVAILABLE.

Advantage Titan® Series central chiller won't let you down. Every Advantage Titan® chiller is supported by application expertise, engineering know how, and un-surpassed service support from experienced technicians.

Since 1977 Advantage has been applying, designing and servicing the best chillers available.

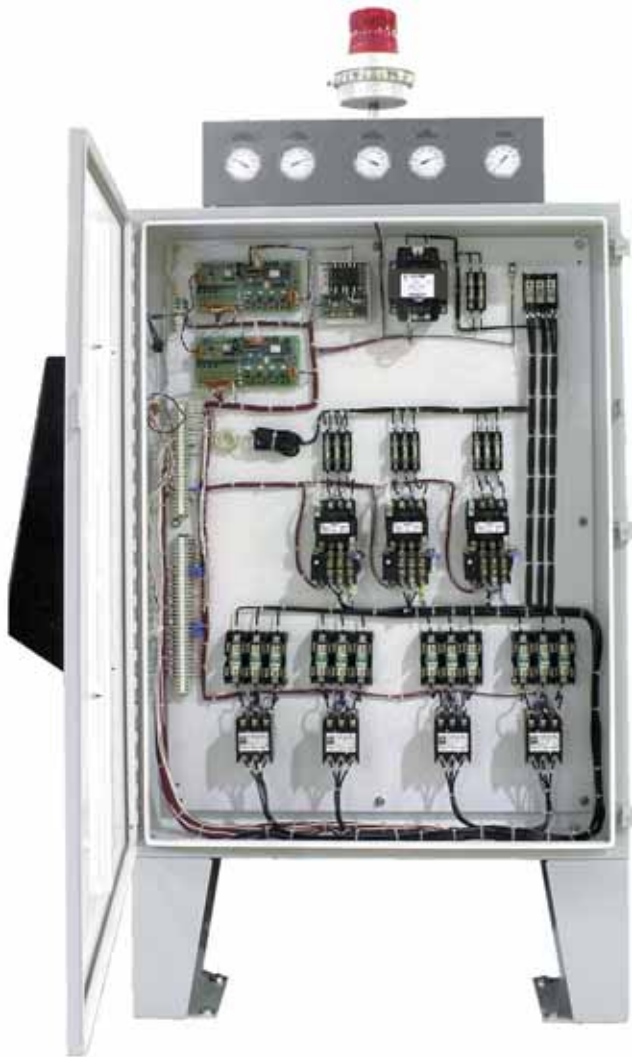
APPLICATIONS

Titan® Series central chiller can be used on a variety of process applications that require 20°F to 70°F chilled water.



ELECTRICAL CABINET

A single power connection is required for the Titan® chiller. Electrical components are housed in Nema-12 cabinet. A control transformer is mounted and wired to provide 115 volt control power to required use points. Compressor contactors and pump motor starters are protected with branch circuit fusing. Wiring from the cabinet to the motors is protected in seal tight conduit. The Titan® multi-zone display panel, pump operators and operating lights are mounted on the cabinet door.



PRESSURE GAUGES

A full compliment of pressure gauges for monitoring system performance. **High Pressure** indicates pressure in the refrigerant circuit from the compressor to the expansion valve. High pressure is important when diagnosing condenser operation. **Low Pressure** indicates pressure in the refrigerant circuit from the evaporator to the suction side of the compressor. **Coolant Pressure** indicates pump pressure delivered to process. Pump pressure is important when diagnosing flow related issues.



LIMIT DEVICES

Limit devices provide protection against machine damage from out-of-spec operating conditions. **High Pressure Limit** prevents operation with excessive refrigerant pressure. **Low Pressure Limit** prevents operation when refrigerant suction pressure is low. **Evaporator flow** prevents operation when inadequate evaporator flow is indicated and safeguards against freezing and damage to the evaporator. **Motor overloads** protect the pump motor from excessive amperage. **Coolant freezestat** prevents compressor operation when the coolant temperature falls below the factory setting and safeguards against evaporator freezing.



COMPONENTS

Phone: 317-887-0729

Web: www.AdvantageEngineering.com

COMPRESSOR...

Hermetic scroll compressors are standard on all models through 60 tons. Scroll compressors have few moving parts; offer low torque variation and a high tolerance to liquid slugging. Reciprocating compressors are standard on 70 ton models.



EVAPORATOR...

Brazed plate evaporators are made of stainless steel plates brazed together with copper brazing material. This design promotes turbulent flow and high heat transfer rates in a compact, non ferrous package. Each refrigerant zone is equipped with its own evaporator which is protected by a coolant freezestat, flow switch, low pressure limit switch and basket strainer.



REFRIGERANT COMPONENTS...

All refrigerant components used in Advantage Titan® chillers are selected for historic reliability and performance. Components include high & low pressure limit switches, freezestat, expansion valve, relief valve, filter dryer and sight glass/moisture indicator.

CONDENSERS

Titan® central chillers are offered with Air-Cooled or Water-Cooled condensers. The selection is influenced by the industrial environment where the Titan® will be installed including available condensing water supply and plant ambient temperatures.

Air-Cooled units use outdoor remote condensers. The Titan® air-cooled condenser is constructed of a heat transfer coil that has copper tubes and aluminum fins for full rated performance at 95°F ambient. The coil is housed in a sheet metal enclosure with fans that provide a vertical air discharge. Ambient operation to -20°F is standard. Field installation is owner supplied, requiring refrigerant piping, system evacuation and charging.



Water-cooled units use tube and shell condensers with removable heads for cleaning. The condenser is equipped with a water regulator valve that maintains stable refrigerant pressures under a wide range of condensing water temperatures and pressures. Water-cooled condensers are manifolded to provide a single process connection.



Manifold for water-cooled condensers. Manifolds include isolation valves.



COOLANT CIRCUIT

Titan® central chillers use a dual pump system... one pump to deliver coolant flow to process and a second pump to deliver coolant flow through the chiller evaporators. The process and evaporator pumps operate independently of each other, allowing for greater control of water temperature, flow and pressure. All pumps are selected for the individual application, giving consideration to flow and pressure requirements. Each pump is

equipped with suction and discharge service valves and is toggled on and off by individual operators.



The **Process Pump** distributes water at full capacity through the plant. A water pressure sensor produces an alarm if the process water pressure falls below desired levels.

The **Evaporator Pump** circulates coolant at the correct flow through the internal evaporators. A discharge basket strainer is placed in this circuit (on units using brazed plate evaporators) as a safeguard against fouling and contamination of the evaporator.

The optional **Standby Pump & Manifold** is useful when service is required on the primary pump but continued operation is necessary. The standby pump is pre-plumbed and wired to serve as a back up for either the process or evaporator pump.



Phone: 317-887-0729

Web: www.AdvantageEngineering.com

WATER MAKE-UP...

This automatic control system uses a level switch activated solenoid valve to feed water to the reservoir from plant supplies. The level switch is mounted in a small enclosed tank external to the reservoir. Positioned at the proper operating water level, the water inside the level switch tank is not subject to turbulence that may exist in the reservoir. The reservoir level can be visually sighted by the clear sight tube.



RESERVOIR...

Patented one-piece seamless design, rotationally molded from linear low density polyethylene and insulated with 3/8" dense foam insulation. The rectangular base accepts straight-line pump connections and offers greater stability. The cylindrical shape adds structural strength. A tank baffle provides true 'hot-cold' operation. All process ports are molded into the tank to offer structural support. The standard service cover has cut-outs for distribution piping and an inspection opening. The tank volume is adequate to support expansion to 2 times its original chiller capacity (adding APT or WPT chilling module and additional pumps).



CHILLER CONTROL

The Advantage Multizone Control Instrument (MZC) has the experience of over 8 years of field service. The control instrument consists of the cabinet door mounted operator interface display and control instrument and internal cabinet mounted intelligent zone boards.



INTELLIGENT ZONE BOARDS

One intelligent zone board is provided for each refrigeration zone. The control instrument communicates with the zone boards to stage each refrigeration zone independently. This brings the process temperature in line with the set point quickly and accurately. In the event of a communication failure, the zone boards assume the control of their respective refrigeration zones and will continue to operate.

The instrument provides control of up to 6 refrigeration zones. Although not all are used on the chiller, the extra zone control can be used for future capacity expansion where **APT** or **WPT** chilling modules are installed and controlled by the chiller control.



DISPLAY CONTROLS & LIGHTS

Soft key controls are provided for selection of zone displays and setpoint. Two large display windows continuously show temperature for **to process** and **setpoint**. Temperatures can be shown in Fahrenheit or Celsius. **From process** temperatures can be displayed momentarily when selected by the operator. The display windows also display setup options.

Status lights are provided for seven system components: **probe**, **low flow**, **high pressure**, **low pressure**, **low oil**, **compressor** and **freezestat**. The condition is indicated by multi-colored LED's. **Solid green** indicates the component is at the run condition. **Flashing**

red indicates that an error condition exists. **Solid red** indicates that an error condition was once present, but is now in an acceptable run condition. Pressing the 'select' button changes a solid red indication into a solid green indication.

The instrument provides an alarm status light on the display, as well as an audible and visual alarm beacon. A selectable refrigeration zone lead/lag mode is a standard feature of the instrument.

NETWORK COMMUNICATIONS

SPI communication is provided via the DB-9 interface. The instrument provides a monitoring system where the communication light will **flash green** during unit to host communication and will **flash yellow** during host to unit communication.

MULTI-FUNCTION OPERATORS

Multi-function start / stop operators provide status and control of each pump individually. Pump on / off and overload status are provided. An emergency stop button is also included.



CAPACITY CONTROL

Every Titan® central chiller is equipped with automatic capacity control to match cooling output to the process load. As the process water approaches the setpoint, the control instrument stages compressors on multi-compressor machines to reduce cooling capacity. Many machines also include a hot gas by-pass valve on each circuit for additional capacity staging.

NOMINAL TONS CAPACITY BY MACHINE AT EACH CAPCITY STAGE							
STEP	1	2	3	4	5	6	7
20 Tons	20	15	10	5	0		
30 Tons	30	22.5	15	7.5	0		
40 Tons	40	30	25	20	10	5	0
50 Tons	50	37.5	31.3	25	12.5	6.3	0
60 Tons	60	45	37.5	30	15	7.5	0
70 Tons	70	57.5	35	17.5	0		

STANDARD FEATURES

RESERVOIR CONSTRUCTION:

- Seamless, rotationally molded, non-rusting polyethylene
- Tank insulation
- Drain valve
- Overflow port
- Hot/cold section partition (baffle)
- Structural base
- Automatic water-level control
- Pump decking
- Spare pump ports
- Tank lid

REFRIGERANT CIRCUITS:

- Hermetic scroll compressors
- Liquid line solenoid valve
- Refrigerant sight glass with moisture indicator
- Thermostatic expansion valve
- Brazed plate evaporator
- Hot gas by-pass capacity control system
- Water-cooled Condenser Models
 - regulator valve
 - manifolded with isolation valves
 - removable heads
- Air-cooled Condenser Models
 - remote, outdoor condenser
 - variable speed fan
 - pressure staging

COOLANT CIRCUIT:

- Large capacity process pump:
 - suction service valve
 - discharge service valve
- Evaporator pump:
 - suction service valve
 - discharge service valve
 - discharge basket strainers

LIMIT DEVICES: (per zone)

- Refrigerant circuit:
 - high pressure limit
 - low pressure limit
 - evaporator flow limit
- Coolant circuit:
 - pump motor overload relay
 - coolant freezestat
- Instrument control circuit fuse

PRESSURE GAUGES (per zone):

- Refrigerant high pressure
- Refrigerant low pressure
- Coolant pressure

ELECTRICAL:

- Nema rated electrical cabinet
- Fused pump motor starters
- Fused compressor motor starters
- Fused transformer
- Power entry terminal block

WARRANTY:

- 1 year on parts and labor
- 2nd year complementary preventative maintenance visit

CHILLER CONTROL INSTRUMENT:

- Microprocessor based multizone controller
- Intelligent zone boards
- Each compressor staged individually
- Large temperature display in °F or °C for *to process* and *from process*
- Large setup display
- Refrigerant circuit indicators per zone: *probe, low flow, high pressure, low pressure, compressor, freezestat, capacity*
- Water circuit indicators: *temperature deviation, low pressure, tank level, probe, phase*
- SPI communications interface
- Selectable lead/lag mode
- Audible and visual alarm

OPTIONS

TANK CONSTRUCTION:

- Epoxy coated mild steel
- Stainless steel wetted surfaces
- Special paint

REFRIGERANT CIRCUIT:

- Compressor CCPR valve for water temperatures above 70°F
- Discus compressor
- Compressor hour meter

COOLANT CIRCUIT:

- Larger process pumps
- Standby pumps and manifolding

ELECTRICAL:

- UL listed electrical panel
- Disconnects

INSTRUMENTATION:

- Remote display kit
- PLC instrument with color touch screen

WARRANTIES:

- Extended compressor warranty

ENGINEERING DESIGN SERVICE



ADVANTAGE staffs a complete CAD based **Engineering Department** with experienced water system designers. Working from customer supplied facility and process information, **ADVANTAGE** designers analyze the entire system and will select the correct component combinations to provide the most efficient output. If one of our standard systems does not fit your application requirements, then **ADVANTAGE** will design a custom system from a long list of available options.

SPECIFICATIONS

		TI-20A	TI-20W	TI-30A	TI-30W	TI-40A	TI-40W	TI-50A	TI-50W	TI-60A	TI-60W	TI-70A	TI-70W
Refrigerant Circuits	Quantity	2	2	2	2	2	2	2	2	2	2	2	2
Capacity¹	Tons	20.5	20.5	30	30	40	40	50	52	60	60	65	70
	KW	72	72	105	105	140	140	175	182	210	210	228	245
Compressor	Quantity	2	2	2	2	4	4	4	4	4	4	2	2
	HP each	10	10	15	15	10	10	13	13	15	15	35	35
	Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Discus	Discus
Process Pump^{2,3}	HP	3	3	5	5	5	5	7.5	7.5	10	10	10	10
	GPM	60	60	90	90	120	120	150	150	180	180	210	210
	PSI	50	50	50	50	48	48	60	60	65	65	60	60
Evaporator Pump	HP	2	2	3	3	3	3	3	3	3	3	5	5
	GPM	50	50	72	72	96	96	120	125	144	144	156	168
Connection Sizes (inches)	Process ¹⁰ (to/from)	2	2	3	3	3	3	4	4	4	4	4	4
	Make-Up	1	1	1	1	1	1	1	1	1	1	1	1
	Overflow	4	4	4	4	4	4	4	4	4	4	4	4
	Condenser	--	2	--	3	--	3	--	3	--	3	--	4
Unit Amperage⁶ (Full Load) @3ø/60hz⁵	230 Volt	94	94	132	132	188	188	240	240	256	256	294	295
	460 Volt	47	47	66	66	94	94	120	120	128	128	147	147
	575 volt	38	38	53	53	76	76	96	96	103	103	119	119
Refrigerant Type⁶	HFCF	22	22	22	22	22	22	22	22	22	22	22	22
Reservoir Capacities (gallons)	Operating	350	350	350	350	350	350	350	350	350	350	350	350
	Holding	450	450	450	450	450	450	450	450	450	450	450	450
Unit Dimensions (inches)	Height	82	82	82	82	82	82	82	82	82	82	82	82
	Width	87	87	87	87	92	92	92	92	92	92	92	92
	Depth (base)	96	96	96	96	96	96	96	96	96	96	96	96
Unit Weight (pounds)	Shipping ⁹	3,550	3,550	4,170	4,170	4,350	4,350	4,990	4,990	5,155	5,155	5,325	5,455
	Operating	7,925	7,925	8,530	8,530	8,710	8,710	9,650	9,650	9,515	9,515	10,280	11,005
Water Cooled Condenser (Required condenser supply)	City (GPM)	--	31	--	45	--	60	--	75	--	90	--	105
	Tower (GPM)	--	61	--	90	--	120	--	150	--	180	--	210
Remote Air-Cooled Condenser													
Quantity		2	--	1	--	1	--	1	--	1	--	1	--
Connections⁷:	Liquid	1 ¹ / ₈	--	2 ¹ / ₈	--	2 ¹ / ₈	--	2 ¹ / ₈	--	2 ¹ / ₈	--	2 ¹ / ₈	--
	Hot Gas	1 ¹ / ₈	--	1 ¹ / ₈	--	1 ¹ / ₈	--	1 ¹ / ₈	--	1 ¹ / ₈	--	1 ¹ / ₈	--
Air Flow⁷:	Fan Quantity	1	--	4	--	4	--	4	--	6	--	6	--
Full Load Amperage⁶ @3ø/60hz⁵	230 Volt	6.2	--	12.4	--	12.4	--	12.4	--	18.6	--	18.6	--
	460 Volt	3.1	--	6.2	--	6.2	--	6.2	--	9.3	--	9.3	--
	575 Volt	2.5	--	5.2	--	5.2	--	5.2	--	7.8	--	7.8	--
Dimensions: (inches)	Height	48 ¹ / ₂	--	48 ¹ / ₂	--	48 ¹ / ₂	--	48 ¹ / ₂	--	48 ¹ / ₂	--	48 ¹ / ₂	--
	Width	45 ¹ / ₈	--	88	--	88	--	88	--	88	--	88	--
	Depth	62 ¹ / ₂	--	96 ¹ / ₂	--	96 ¹ / ₂	--	122 ¹ / ₂	--	143 ¹ / ₂	--	186 ¹ / ₂	--
Weight: (pounds)	Shipping ⁹	510		1,070		1,200		1,590		1,720		2,050	

Notes:
 1. Tons capacity at 12,000 BTU/ton @ 50°F LWT @ 115°F condensing temperature for air-cooled models, 105°F condensing temperature for water-cooled models.. Capacities may be +/- 5% as reserved by the compressor manufacturer. Capacities multipliers are 50°F - 1.00; 40°F - .80; 30°F - .60; 20°F - .40. The minimum recommended operating temperature when no glycol is used is 48°F. 2. Consult FYI #4-C-38 and 5-A-261 for characteristics relating to pump curves. 3. Selection of optional pumps for higher flow rates will raise the minimum recommended operating temperature when no glycol is used. 4. Full Load amps are higher than run load amps and must be used for sizing disconnects and supply wiring. 5. Consult factory for 50hz operation. 6. Field installation including piping connection and charging of remote air-cooled condenser by owner. 7. Vertical air discharge from condenser. 8. Full load amperage shown for single condenser unit. Some models use multiple condenser units. 9. Unit weight crated for shipment. 10. Process connections may vary based on unique pump flow requirements of your process. Confirm you connection size requirement with your Advantage sales representative.

OTHER PRODUCTS



Model Designator for Titan® Series Central Chillers

TI - 60A
 Titan® Series Condenser
 A: Air-Cooled
 W: Water-Cooled
 Tons of Capacity



Phone: 317-887-0729 Web: www.AdvantageEngineering.com

ADVANTAGE PRODUCTS: TEMPERATURE CONTROLLERS • PORTABLE CHILLERS • CENTRAL CHILLERS • PUMP TANK STATIONS • TOWER SYSTEMS • FILTERS

ADVANTAGE ENGINEERING, INC. 525 East Stop 18 Road Greenwood, IN 46142 phone: 317-887-0729 fax: 317-881-1277

web site: www.AdvantageEngineering.com email: sales@AdvantageEngineering.com ©2006 ADVANTAGE ENGINEERING, INC. Form #ADV-597 5/06

SINCE PRODUCT INNOVATION AND IMPROVEMENT IS OUR CONSTANT GOAL, ALL FEATURES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR LIABILITY.