



ACDS Series 60Hz

Air Cooled Scroll Compressor Direct Expansion Chillers
Cooling Capacity: 10 to 180 TR (35 to 633 kW)



R410A



DUNHAM-BUSH

Products that perform...By people who care

INTRODUCTION

For more than 100 years, Dunham-Bush has focused on innovative product development. Today, we provide a full portfolio of HVAC/R products from Fan Coil Units to large centrifugal chillers as well as many other innovative green solutions. Our commitment to innovation, matched with an aggressive attitude toward growth, makes Dunham-Bush a leader in global markets. Our product development is tailored to meet the specific needs of customers, building-by-building, country-by-country and region-by-region. No other HVAC/R manufacturer takes this approach to meeting your performance expectations.

ACDS, Air Cooled Scroll Compressor Direct Expansion Chillers, have a cooling capacity range from 10 to 180 TR [35 to 633 kW] in 60Hz version using environmentally sound HFC-410A refrigerant. The entire product line features energy efficiency, installation ease, control flexibility, high reliability, compact footprint and advanced controls. The ACDS range is AHRI certified and ETL listed.

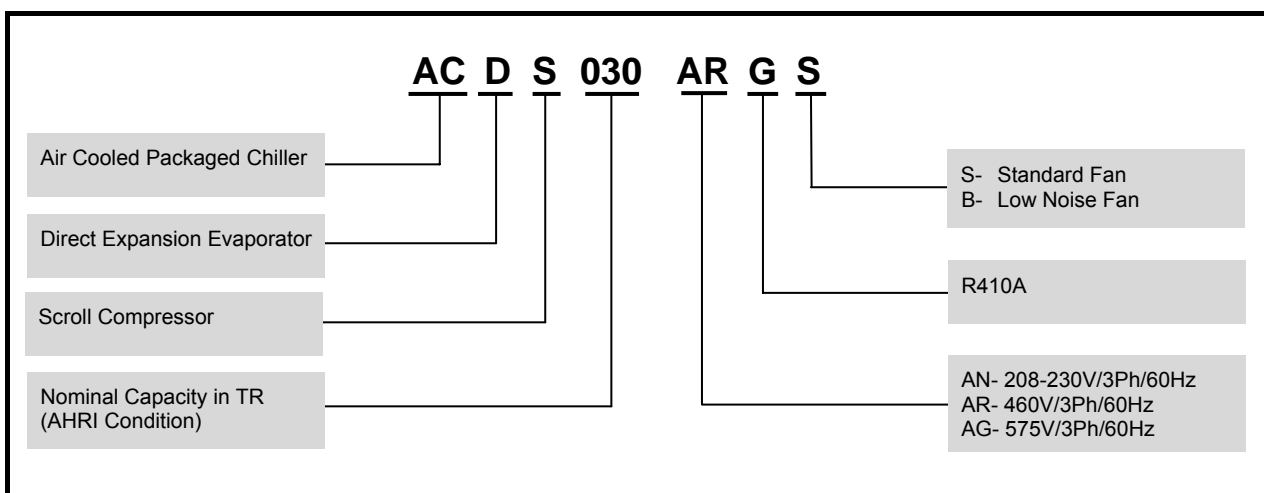
Scroll Compressors are designed for Commercial/Industrial Applications and provide the same high quality and efficiency as Reciprocating or Screw Compressors. They have been developed specifically for use in Packaged Chillers and Condensing Unit products.

Upon shipment, the new ACDS R410A unit is installation-ready with a compact size, reduced weight, and complete factory piping and wiring. Refrigerant charge is included and a thorough factory test under load is conducted on each unit to ensure trouble-free start-up and operation.

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NOMENCLATURE



STANDARD FEATURES & BENEFITS

COMPRESSOR

- ✿ Reliable Tandem or Trio scroll compressors
- ✿ Compressor lead-lag configuration on all models

EVAPORATOR

- ✿ Compact and high efficiency brazed plate heat exchanger
- ✿ Design pressure of 450 psig [31 bar] on refrigerant circuit
- ✿ Design pressure of 400 psig [28 bar] on fluid circuit

CONDENSER

- ✿ Copper tubes with aluminum fins
- ✿ Sub-cooling enhancement for efficiency
- ✿ Low noise direct driven propeller fans
- ✿ IP 54 motor construction

ELECTRICAL/CONTROL

- ✿ Wide range of optional items are available
- ✿ Sizes 10 to 70 TR use electromechanical controller for ease of operation
- ✿ Proactive full function PC Windows® based microcomputer controller, Vision 2020i for sizes 80 to 180 TR
- ✿ Separate power and control panels
- ✿ High/ low pressure limiting function ability

QUIET OPERATION

- ✿ Quiet scroll compressors on standard unit
- ✿ Ultra-quiet operation with compressor acoustic enclosure available as option

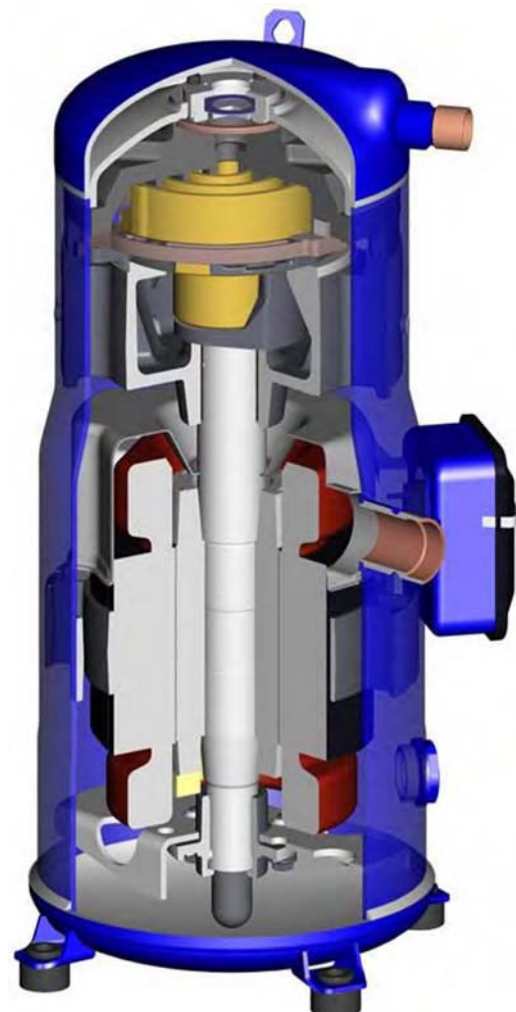
UNIT FEATURES

SCROLL COMPRESSOR

In a scroll compressor, the compression is performed by two scroll elements located in the upper part of the compressor.

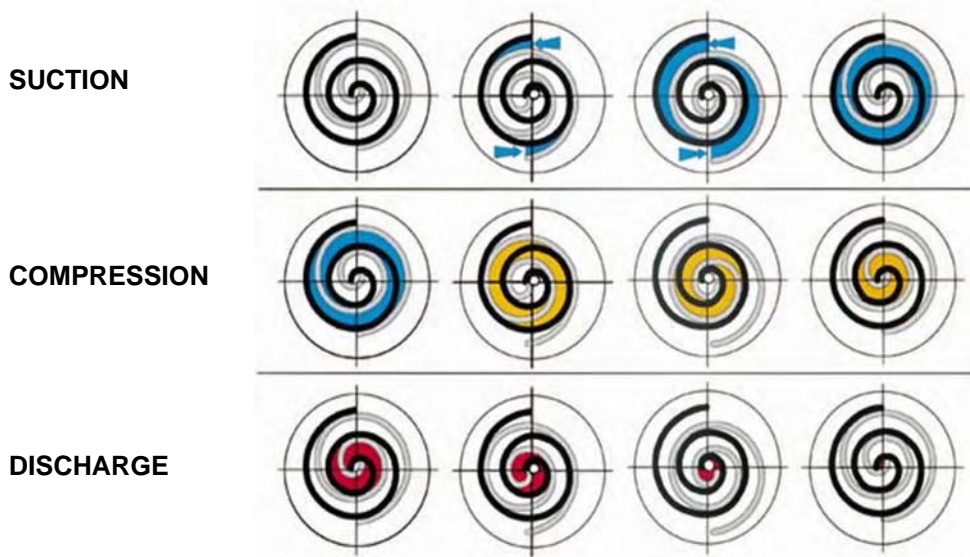
Suction gas enters the compressor at the suction connection. The motor is suction gas cooled, oil droplets separate and fall into the oil sump. After exiting the electrical motor, the gas enters the scroll elements where compression takes place. The refrigerant gas leaves the compressor through the discharge port.

The principle of scroll compression is shown on next page. The centre of the orbiting scroll (in grey) traces a circular path around the centre of the fixed scroll (in black). This movement creates symmetrical compression pockets between the two scroll elements. Low-pressure suction gas is trapped within each crescent-shaped pocket as it gets formed; continuous motion of the orbiting scroll serves to seal the pocket, which decreases in volume as the pocket moves towards the centre of the scroll set increasing the gas pressure. Maximum compression is achieved once a pocket reaches the centre where the discharge port is located; this stage occurs after three complete orbits. Compression is a continuous process: the scroll movement is suction, compression and discharge all at the same time.



UNIT FEATURES

Principle Of Scroll Compression



BRAZED PLATE HEAT EXCHANGER (BPHE)

BPHE represents the cutting edge of heat exchanger technology – one of the most effective and efficient thermal transfer solutions in the world today.

Extremely Compact - reduction in the volume and weight of a shell-and-tube exchanger of the same capacity. This means great design freedom for every application- and reduced installation costs.

Maximum Material Efficiency - no "dead zone" outside gaskets because there is no need for gaskets.

Reduced Refrigerant Charge - the compact system requires only a fraction of the heat transfer medium, e.g. refrigerant. Less volume costs less-and is positive for the environment.

Lower System Costs - better heat transfer coefficient (HTC) gives better ΔT (temperature difference), which in turn means a lower mass flow of media, resulting in smaller, less expensive pumps, etc. and lower energy consumption.

Small Temperature Difference - operates efficiently even at temperature differences as low as 1 K.

High Working Pressure - capability.

Low Pressure Drop - in most case lower than in any other system. Allows smaller pumps and lower operating costs.

True Counter Flow - design allows close temperature approach.

Self-Cleaning - thanks to high turbulence throughout the exchanger, reducing maintenance time and cost.



Uniform High Quality - plates are pressed in the same tool, brazed in the same automated procedure with rigorous standards of quality control. Performance is known and consistent. Maintenance and repair are minimized.

UNIT FEATURES

AIR SIDE CONDENSER

All units have direct drive propeller fans and motors. Close blade tip clearance with the fan venturis assure smooth, quiet operation.

All air-cooled condensers are formed of 3/8 inches [9.5mm] diameter copper tubes mechanically expanded into aluminum fins for maximum efficiency of heat transfer between the circulating refrigerant and air. The fins have full-spacing collars which completely cover each tube. The staggered tube design improves the thermal efficiency of the coil and eliminates bypassing of air around the tubes. The return bends, headers and nipples are all copper, sized for minimum pressure drop, brazed with inert gas in the tubes and tested after fabrication to 650 psig [44.8 bar].

A separate subcooling circuit is standard on all units to maximize energy efficiency.

Fan cycling control is supplied as a standard. This lowers the minimum ambient temperature at which the package equipment will effectively start and operate. For lower ambient requirements than standard, variable speed options are available.

ELECTRICAL / CONTROL

STARTER/CONTROL PANELS

The starter/control panels provided on these units are some of the finest available in our industry. Panel enclosures are made of heavy gauge steel. Wires and terminal strips are numbered to simplify installation, maintenance and service. Wires are bundled together with plastic wire ties and all wires are cut to length, without any doubling-back or extraneous wire.

The starter-control panel is furnished completely with all starting equipment, safety controls and automatic controls factory mounted, prewired and set. Control voltage is 115 volts on all units. All power components are prewired to a single terminal block sized for copper conductors. Multiple source power connections on remote wired starters are not required.

POWER PANEL

Factory wire DOL starters for compressor(s), condenser fan motor(s), with indicating lights.

Anti-recycling timer will be provided to prevent compressor short cycling. DOL starters are mounted in the units. Reduced voltage starter available.

SAFETY CONTROLS

3 Phase Starters With Thermal Overload Protection

These devices react quickly to an overload

condition giving prompt protection to each compressor. They are manually reset.

High Low Pressure Switch (10-70TR)

A high-low pressure switch is provided with every refrigerant circuit. The high pressure is sensing condensing pressure, with a manual reset. It opens the compressor run circuit. The low pressure senses evaporating pressure. If there is a danger of fluid freeze-up, depending on the cooling fluid used in the building system, the machine will shut down, with a manual reset required.

Freeze Protection Thermostat (10-70TR)

This thermostat senses outlet chiller fluid (or other liquid being cooled) and will trip if the temperature drops below its pre-set minimum. The control is a manually reset device.

Compressor Motor Protection

ACDS scroll compressors have a motor protection system consisting of an external electronic control module connected to a chain of embedded PTC (Positive Temperature Coefficient) sensors. The sensors are calibrated for proper motor protection in case of motor overheating caused by overload, low refrigerant flow, incorrect motor rotation, etc. The module has 30 minutes time delay before reset in the event of protector trip.

AUTOMATIC CONTROLS

Multi-Step Operating Control

This device controls the operation of the compressor(s) by sensing the return chilled fluid temperature. On standard multiple compressor units this device is a precise solid-state controller providing smooth and repeatable operation.

Anti-Recycle Timer

Each compressor has an anti-recycle timer built in the controller, which prevents restart for five minutes after a start. The purpose of this device is to avoid excessive motor winding temperature rise and impose undue wear on starters and is fitted as standard.

Fan Pressure Switch (Automatic)

This switch is used to stage condenser fans "on" or "off" for maintaining adequate discharge pressures for proper system operation by controlling air flow across the control coil.

UNIT FEATURES

TEMPERATURE CONTROLLER

Fluid Temperature Control

Control of the fluid temperature is achieved by an intelligent microprocessor thermostat which allows simple user configuration. The controller will arrive on site with the factory settings listed opposite. As all systems are not the same these presets may require changing to suit site conditions. Note that the chilled fluid setpoint should not be set below 4.5°C without the use of Glycol in the fluid system to prevent freezing.

Timer Between Compressors

The timer does not allow multiple compressors

on a unit to start at the same time. This minimizes electrical demand and wiring cost.

UNIT CASING

All GI steel panels are powder coated paint which gives excellent finishing, weather and corrosion resistance. Before ED (Electrophoresis Deposition) coating, the part undergoes a complete pre-treatment process which involves degreasing, phosphating and rinsing with deionized fluid. It increases the effect of paint adhesion and rust preventing to obtain high quality paint film. Powder coating is the best painting system which can even coat inaccessible places like the edges, joints or interior surface of hollow sections.

UNIT OPTIONS / ACCESSORIES

Options are installed at the factory. Accessories are shipped loose.

OPTIONS

Low Noise Fan (LN)

For applications where reduced sound levels are required. Provide the quietest operating refrigeration equipment possible.

Compressor Acoustic Jacket (LN2)

Compressor acoustic jackets have been developed to meet specific extra-low noise requirements. They are made from high performing sound proof material and offer excellent high and low frequency attenuation.

Low Ambient Control (LA1) Minimum ambient 30°F [-1.1°C]

Units use standard fan cycling in conjunction with coil solenoid control to operate down to 30°F [-1.1°C].

Low Ambient Control (LA2) Minimum Ambient 0°F [-17.8°C]

The incorporation of both variable frequency drive for the condenser motor(s) and coil solenoid control will enable the chiller to operate down to 0°F [-17.8°C].

Extra Low Ambient Control (LA3) Minimum Ambient -20°F [-28.9°C]

Includes LA2 and EEV (Electronic Expansion Valve(s)) options and requires the use of 50% glycol and at least 50% load available at starting.

Heater tape is available as well. Glycol is recommended for additional protection.

Desuperheaters (DES)

A desuperheater is simply a refrigerant-to-water heat exchanger installed between the compressor and condenser. It is used to reclaim the readily available superheat energy which would otherwise be rejected through the condenser. The desuperheater is a way of obtaining 'free' heat from the chiller.

Copper Fin Condenser (COP)

Copper fin and tube condenser.

Poly Fin Condenser (HYD)

The material is a polyester coating baked onto the aluminum fin stock prior to final manufacture, rather than material applied to the assembly after formation of the coils. The pre-coated fin material has been tested for salt spray corrosion resistance using ASTM B117 specification.

Convenience Outlet (CON)

Dual 3-pin ground fault receptacle powered from a dedicated transformer and fused for 15 amps.

Hot Gas Bypass (HGBP)

To maintain units on-line when the minimum load is below the mechanical unloading range. This minimizes compressor cycling and extends component life, on extra low load conditions.

Weather Proof Alarm Bell (WPA)

Mounted and wired to indicate a common alarm fault.

UNIT OPTIONS / ACCESSORIES

Gauges (GAG)

Includes suction and discharge pressure gauges for all unit models. The microcomputer where fitted also displays discharge and suction pressure.

Over and Under Voltage Protection Relay (UVR)

Combined relay offering protects against high and low supply voltage conditions as well as single phasing, phase reversal and phase imbalance by interrupting the control circuit. It is an automatic reset device, but the microcomputer can be set up for manual reset to prevent unwanted restarts.

Unit Ground Fault Interrupt (GFI)

This takes the unit off line if a ground fault is detected.

Optional full length painted steel louvers (LUV)

For the maximum protection of condenser fins and mechanical components.

Low Ambient Lock-Out (LAL)

Uses an ambient sensor and requires a lock-out set point entered into the microcomputer controller.

3-Phase Voltmeter With Selection Switch (VM3)

Single analog voltmeter installed with a 3 phase selector switch for indication, located inside the control panel.

3-Phase Amperage Meter With Selection Switch (AM3)

Single analog ammeter with a 3 phase selector switch for indication, located inside the control panel.

VISION 2020i - optional for sizes 10- 70TR (V2C)

Vision 2020i is a flexible and advance programmable electronic controller designed specifically for the applications and precise control of Dunham-Bush chillers.

System Voltage Measurement (VOLT)

A voltage transducer is added to display the system voltage on the unit microprocessor. This options is only applicable for units with Vision 2020i controller only.

DB Director (DBD)

DB Director is a full function microcomputer with Windows® based PC interface. All information is displayed using common terms that are easy to understand. The alphanumeric liquid crystal display (LCD) utilizes easy to understand menu-

driven software. DB Director is the optional controller offered for all the models.

IP55 Control Panel (IP55)

A fully enclosed electrical control panel built in accordance with IP55 construction.

Remote Fluid Temp Monitoring (RFTR)

Unit control is based on leaving fluid temperature with a specific temperature differential (range), so the return fluid temperature is for information only.

Demand Limiting (AMPL)

Requires a remote analogue input signal that is used to cycle compressors to limit electrical demand.

Evaporator Heater (EVH)

Heater provide protection from freezing out to -20°F[-28.9°C] ambient.

Hydronic Pump Package (HPP)

This option adds circulating pumps, complete with insulated expansion tank. Available in a single or dual (duty & standby) evaporator versions, with total dynamic head external to the chiller for 50 feet.

ACCESSORIES

Water Flow Switch (WFS1)

Paddle type field adjustable flow switch. Must be tied into the unit safety circuit so that the package will remain off until fluid flow is proved. Helps prevent evaporator freeze up. NEMA 1 enclosure, for use on fluid, ethylene or propylene glycol circuits. For applications where fluid and ambient temperature are at a minimum 32°F [0°C].

Water Flow Switch (WFS4)

Paddle type field adjustable flow switch. Must be tied into the unit safety circuit so that the package will remain off until fluid flow is proved. Helps prevent evaporator freeze up. NEMA 4 enclosure, for use on fluid, ethylene or propylene glycol circuits. For applications where fluid and ambient temperature are at a minimum 62°F [16.7°C].

Rubber-in-shear Isolators (RIS)

Designed for ease of installation, these rubber, one piece, molded isolators have slip resistant base plates. Applicable for most installations.

Spring Isolators (SPG)

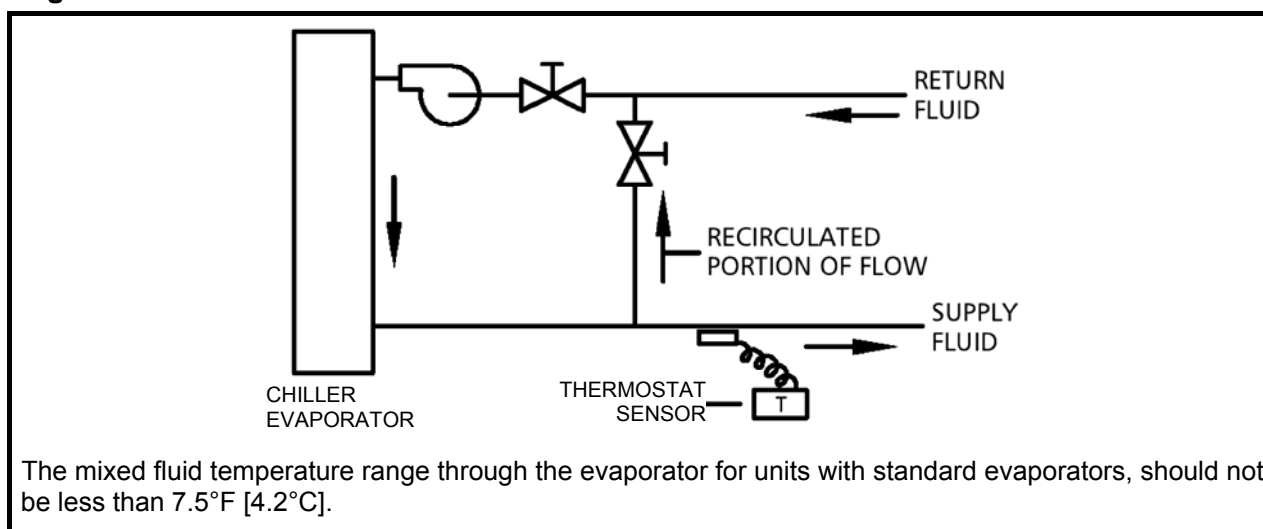
Designed for 1" [25.4mm] deflection, these enclosed spring assemblies have a neoprene friction pad on the bottom to help prevent the transmission of noise and a lock bolt for leveling. Neoprene inserts prevent contact between the steel upper and lower housings. Suitable for more critical applications than RIS isolators.

APPLICATION DATA

Evaporator Design Data

1. **Maximum** - Leaving chilled fluid temperature (LCFT) is 60°F [18°C]. The unit can start and pull down with up to 80°F [27°C] entering-fluid temperature. For sustained operation, it is recommended that the entering fluid temperature not exceed 70°F [21°C].
2. **Minimum** - LCFT is 40°F [5.5°C] for all models. Medium temperature glycol application selections from 20°F [-6.6°C] to 39°F [3.9°C] are available from the factory.
3. Minimum/Maximum Flow Rates - refer to Physical Data.
4. Pressure Drop Data - refer to pressure drop and glycol correction factors.
5. Wide Range ΔT - Low Flow Applications
 - a. Multiple smaller chillers may be applied in series, each providing a portion of the design temperature range typical 10°F [5.5°C] each.
 - b. Chilled fluid may be recirculated through the evaporator as shown below to allow the chiller to operate with acceptable flow rates and temperature ranges (Figure 1A).

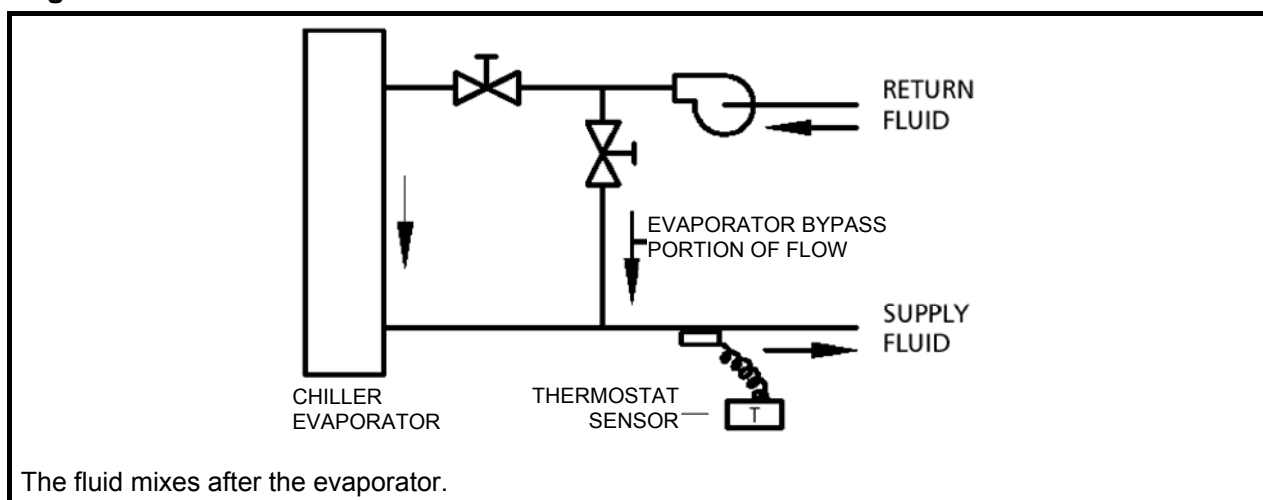
Figure 1A



6. Narrow Range ΔT - High Flow Applications
 - a. For Extra-Narrow Range ΔT applications a partial evaporator bypass piping and valve configuration can be used as shown below.

This permits a higher ΔT and lower ΔP (pressure drop) through the evaporator (Figure 1B).

Figure 1B



APPLICATION DATA

Minimum Chilled Fluid Loop Volume

Model ACDS	Air Conditioning Applications		Process Applications				
	USgal	Liters	USgal	Liters		USgal	Liters
010	30	114	60	211	to	108	380
020	60	229	120	422	to	216	760
030	90	343	180	633	to	324	1140
040	120	457	240	844	to	432	1519
050	150	572	300	1055	to	540	1899
060	180	686	360	1266	to	648	2279
070	210	800	420	1477	to	756	2659
080	240	914	480	1688	to	864	3039
090	270	1029	540	1899	to	972	3419
100	300	1143	600	2110	to	1080	3798
120	360	1372	720	2532	to	1296	4558
135	405	1543	810	2849	to	1458	5128
150	450	1715	900	3165	to	1620	5698
165	495	1886	990	3482	to	1782	6267
180	540	2057	1080	3798	to	1944	6837

*Values calculated for AHRI Conditions of Service (C.O.S.)

Type of Application	USgal/TR	l/kW	USgal = USgal/TR x AHRI Capacity in TR
Normal Air Conditioning	3	3.25	Liters = l/kW x AHRI capacity in kW
Process Cooling	6 -10	6.5 -10.8	

For applications with other than AHRI C.O.S. calculate the system loop volume based on the adjusted or corrected unit capacity.

Tanks for System Volume Enhancement

It may be necessary to install a tank in the system to provide sufficient system fluid volume, as shown below. The tank should be baffled and piped for proper fluid mixing to prevent stratification.

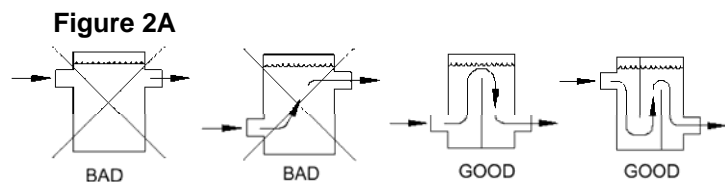


Figure 2B Single Loop System with Storage Tank to Increase Loop Volume

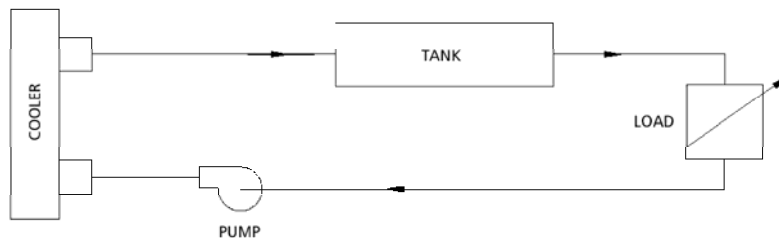
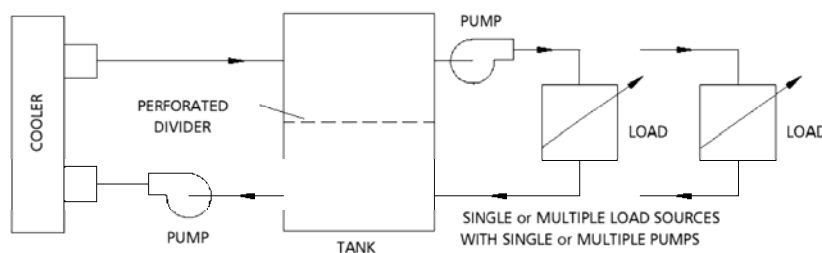


Figure 2C Primary and Secondary Loop Systems are normally used where the secondary system has variable flow and/or multiple loads. See example below.

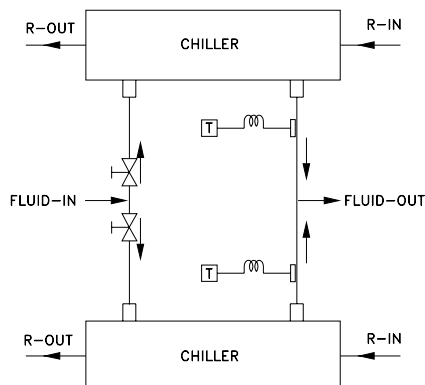


APPLICATION DATA

MULTIPLE CHILLERS PER CHILLED WATER SYSTEM

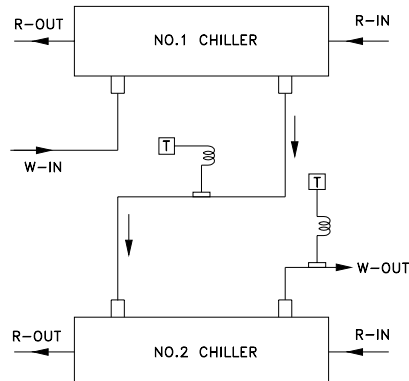
1. Where the load is greater than available from one ACDS, where standby capacity is required or the load profile dictates, multiple chillers may be piped in parallel. Units of equal size help to ensure fluid flow balance, but balancing valves ensure balanced flows even with dissimilar sized chillers. Temperature controller sensors may or may not need to be moved to the common fluid piping depending on the specific application.
2. Parallel Chiller Applications (Figure 3A). Both units operate simultaneously modulating with load variations. Each unit operates independently sensing its own leaving fluid temperature. The set point of each thermostat is set to maintain the desired loading scheme.

Figure 3A



3. Series Chiller Applications (Figure 3B) Where a large temperature range is required (over 25 °F [13.9 °C]), the chiller may be piped in series. In this case the units are controlled independently. The load is progressive by temperature so the chiller selections are critical.

Figure 3B



Oversizing Chillers

Oversizing of chillers more than 5-10% is not recommended. Oversizing causes energy inefficiency and shortened compressor life due to excessive compressor cycling. Future load requirements may result in temporary oversizing of equipment which will require careful unit selection. It may be better to properly size for the initial load and add another unit later for future increase. The use of multiple units is recommended where operation at minimum load for prolonged periods is expected and goal control required. Fully loaded equipment operates better and more efficiently than large equipment running at or near minimum capacity.

Hot gas bypass should not be a means to allow oversizing of chillers. Hot gas bypass should only be used where the equipment is sized properly for full load but the minimum load expected is lower than can be achieved by mechanical unloading is less than the minimum unloading step available.

Sound and Vibration

The compressors in ACDS units are resiliently mounted to reduce the transmission of any noise and vibration to the frame.

The compressors are not mounted on springs because extra movement may cause line breakage and refrigerant leaks. Unit isolation helps prevent any remaining sound or vibration from entering the building structure, piping or electrical service.

Water (Fluid) Strainers

It is recommended that 40-mesh strainers be installed in the fluid piping as close to unit evaporator as possible.

SELECTION PROCEDURE

Design Requirements

The following design requirements must be known in order to select a packaged chiller.

- *1.) Required cooling capacity in TR [kW].
 - 2.) Evaporator outlet fluid temperature °F [°C].
 - *3.) USgpm of chilled fluid to be circulated.
 - *4.) Chilled fluid cooling range (fluid in °F[°C]- fluid outlet °F[°C])
 - 5.) Design ambient temperature °F[°C].
 - 6.) Electrical power characteristics.
 - 7.) Special codes (local, state or national codes) with which unit must comply
- *Any 2 out of 3 must be known

EXAMPLE

Select an air cooled packaged chiller for the following conditions:

100 TR at 54°F [12.22°C] entering, 44°F [6.67°C] leaving chilled fluid. R410A refrigerant design ambient is 95°F [35°C]. Minimum operating ambient is +0°F [-17.78°C]. Altitude is 2000 feet [609.6m]. Chiller fouling factor 0.0005. Electrical characteristics 460V/3/60Hz with single power connection.

Step 1- Unit Selection

For 2000 feet [609.6m] elevation divide the specified tonnage by the capacity correction factor from Table 4.

$$\frac{100 \text{ TR}}{0.99} = 101 \text{ TR}$$

For 0.0005 fouling factor divide the required tonnage at 2000 feet [609.6m] by the fouling correction factor from Table 5.

$$\frac{101 \text{ TR}}{0.978} = 103.3 \text{ TR}$$

Entering the capacity data for R410A we see that an ACDS 100 unit for water at sea level has a capacity of 100.78 TR, drawing 108.72 compressor kW. The kW correction factors from Table 4 and 5 will be applied to the compressor kW below. For the conditions specified, the unit will do:

$$\begin{aligned} \text{Capacity} &= 100.78 \times 0.99 \times 0.978 = 88.70 \text{ TR} \\ \text{Compressor kW} &= 108.72 \times 1.01 \times 0.99 \\ &= 108.71 \text{ kW} \end{aligned}$$

Step 2- Evaporator USgpm and Pressure Drop

$$\begin{aligned} \text{USgpm} &= \frac{\text{Specified TR} \times 24}{\text{Cooling Range}} = \frac{100 \times 24}{10} \\ &= 240 \text{ USgpm [54.50m}^3\text{/hr]} \end{aligned}$$

Step 3- Chilled Fluid Pump Selection

To the pressure drop calculated in Step 2, add the pressure drop through the chilled fluid loop piping, valves and equipment. This will be the foundation of your pump selection criteria.

Glycol Freeze Protection

If the chiller or fluid piping is to be exposed to temperatures below the freezing point of fluid, glycol protection is recommended. The recommended protection is 10°F [5.6°C] below the minimum ambient temperature. Use only glycol solutions approved for heat exchanger duty. The use of automotive anti-freeze is not recommended because they have short-lived inhibitors and fouling of the vessels will occur. If the equipment is exposed to freezing temperatures and not being used, the vessels and the piping should be drained.

The freeze protection level should be 10°F [5.6°C] lower than the leaving brine temperature. The use of glycol causes a performance derate as shown in Table 2 for ethylene glycol and Table 3 for propylene glycol and needs to be included in the unit selection procedure.

Table 2 : Ethylene Glycol

% E. G. By Weight	Freeze Point		C1 Capacity Factor	K1 kW Rate	G1 Flow Factor	P1 P.D. Factor
	°F	°C				
10	26.2	-3.2	0.995	0.998	1.019	1.050
15	22.4	-5.3	0.991	0.997	1.030	1.083
20	17.8	-7.9	0.988	0.996	1.044	1.121
25	12.6	-10.8	0.984	0.995	1.060	1.170
30	6.7	-14.1	0.981	0.994	1.077	1.219
35	0.0	-17.8	0.977	0.992	1.097	1.275
40	-10.0	-23.3	0.973	0.991	1.116	1.331
45	-17.5	-27.5	0.968	0.990	1.138	1.398
50	-28.9	-33.8	0.964	0.989	1.161	1.466

Table 3 : Propylene Glycol

% P. G. By Weight	Freeze Point		C2 Capacity Factor	K2 kW Rate	G2 Flow Factor	P2 P.D. Factor
	°F	°C				
10	26.1	-3.3	0.988	0.994	1.005	1.019
15	22.8	-5.1	0.984	0.992	1.008	1.031
20	19.1	-7.2	0.978	0.990	1.010	1.051
25	14.5	-9.7	0.970	0.988	1.015	1.081
30	8.9	-12.8	0.962	0.986	1.021	1.120

Table 4 : Correction Factor - Elevation

Elevation above Sea Level		Capacity Correction Factor	kW Correction Factor
Feet [m]	Meters Factor		
0	0	1.00	1.00
2000 [609.6m]	600	0.99	1.01
4000 [1219.2m]	1200	0.98	1.02
6000 [1828.5m]	1800	0.97	1.03

Table 5 : Correction Factor - FF

Fouling Factor		Capacity Correction Factor	kW Correction Factor
Hr.ft².°F/BTU	m².°C/kW		
0.0001	0.018	1.000	1.000
0.00025	0.044	0.993	0.997
0.00050	0.088	0.978	0.990
0.00100	0.176	0.951	0.978

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