

DC Series

Commercial / Industrial Refrigeration Desuperheater Waste Heat Recovery



- Domestic Hot Water
- Heating
- Process Water Heating
- Space Heating
- Pool Heating
- Hot Deck Reheat
- Sub-Soil Heating
- Restaurants
- Hotels/Motels
- Hospitals
- Schools
- Food Processing
- Ice Rinks
- Dormitories



Sample Savings Estimates

RECYCLE WASTE HEAT AND SAVE MONEY

Refrigerant desuperheater waste heat recovery systems can recycle rejected heat from your air conditioning or refrigeration system and use it to heat water or other fluids. At the same time, desuperheating lowers refrigerant temperature and pressure, reducing energy input to the compressor. You save by reducing or eliminating the energy required for water heating while increasing the efficiency of the air conditioning/refrigeration system.

HOW DOES A DESUPERHEATER WORK?

In the refrigeration cycle, refrigerant is pumped from the compressor at high (150° to 200° +F) temperatures so that it can reject heat and condense to a liquid form. About 25% of this heat is called “superheat” and is easily recycled into lower temperature water. Water is pumped from a storage tank through the desuperheater and back to the tank (closed loop) adding heat to the water with each pass through the heat exchanger. This heat exchange results in increased efficiency for the refrigeration system while, at the same time, producing “free hot water”.

HOW MUCH CAN A DESUPERHEATER SAVE?

Several factors will determine your actual savings. Hot water use, heating system efficiency and fuel cost, as well as cooling system size and run time, must be known in order to make accurate energy savings forecasts. As with any investment, a careful analysis should be made. However, with today's energy costs, virtually any application with moderate to heavy cooling and water heating loads will yield attractive savings. Simple pay backs under two years are very common, yielding investment returns of 50% and more.

WHERE CAN DESUPERHEATERS BE USED?

Desuperheaters can be applied to any refrigeration system with reciprocating, rotary, scroll or screw-type compressors. Facilities such as motels, hotels, schools, hospitals, restaurants, health clubs and food processing are typical applications. Heating potable water for domestic use is most common. Applications for hot deck reheat, space heating, subsoil heating (freezer and ice rinks) and process fluid heating are very cost effective.

FEATURES

Heat Exchanger: Coaxial counterflow, vented double wall, surface enhanced for superior heat transfer. Pressure tested to 450 psi refrigerant side, 150 psi water side.

Pump: Maintenance free, in-line, single stage, wet rotor type; stainless steel or bronze impeller and volute; 145 psi rated pressure; for use in potable hot water system. Integral thermal motor protection.

Controls: Water safety limit thermostat (standard). Optional controls include relief valves, refrigerant pressure controls, water modulating valves, bypass/isolation circuits (water and refrigerant). Consult factory for special control needs.

Cabinet: All components housed in .040” aluminum alloy, insulated, weather-resistant cabinet with removable service panel. Bottom mounting rails provided as standard.

Technical Data

Models ¹	Max. Tons or HP	Refrig. Circuit		Std. Ref. Line O.D. ²		Water Line Nominal ³	Pump Model# ⁴	GPM @ FT. HD.	Approx. Weight (lbs.)	Cabinet Dimensions		
		S ⁶	D ⁷	S ⁶	D ⁷					⁶ Length ⁷	Width	⁶ Height ⁷
ADC005S*	5	1	n/a	5/8"	n/a	1/2"	006BC4Y	2 @ 8'	27	28"	17"	7"
SDC005SO	5	1	n/a	5/8"	n/a	1/2"	n/a	n/a	18	28"	17"	7"
ADC010S/D*	10	1	2	7/8"	5/8"	3/4"	UP15-42	4 @ 14'	33	28"	17"	7"
SDC010S/DO	10	1	2	7/8"	5/8"	3/4"	n/a	n/a	27	28"	17"	7"
ADC015S/D*	15	1	n/a	1-1/8"	7/8"	3/4"	UP15-42	6 @ 13'	43	36"	17"	7"/8"
SDC015S/DO	15	1	n/a	1-1/8"	7/8"	3/4"	n/a	n/a	36	36"	17"	7"/8"
ADC020S/D*	20	1	2	1-1/8"	7/8"	3/4"	UP15-42	8 @ 11'	51	30"	17"	11"/12"
SDC020S/DO	20	1	2	1-1/8"	7/8"	3/4"	n/a	n/a	67	30"	17"	11"/12"
ADC025S*	25	1	n/a	1-3/8"	n/a	1"	UP15-42	10 @ 10'	60	36"	17"	10"
SDC025SO	25	1	n/a	1-3/8"	n/a	1"	n/a	n/a	44	36"	17"	10"
ADC030S/D*	30	1	2	1-3/8"	1-1/8"	1"	UP26-96	12 @ 18'	76	36"	18"	10"/12"
SDC030S/DO	30	1	2	1-1/8"	1-1/8"	1"	n/a	n/a	62	36"	18"	10"/12"
ADC040S/D*	40	1	2	1-5/8"	1-1/8"	1-1/4"	UP26-96	16 @ 13'	95	36"	18"	14"/16"
SDC040S/DO	40	1	2	1-5/8"	1-1/8"	1-1/4"	n/a	n/a	79	36"	18"	14"/16"
ADC050S/D*	50	1	2	1-5/8"	1-1/8"	1-1/4"	UP26-96	20 @ 8'	121	36"	18"	20"/22"
SDC050S/DO	50	1	2	1-5/8"	1-1/8"	1-1/4"	n/a	n/a	102	36"	18"	20"/22"
ADC060S/D*	60	1	2	2-1/8"	1-3/8"	1-1/2"	UP43-75	24 @ 14'	142	36"	18"	22"/24"
SDC060S/DO	60	1	2	2-1/8"	1-3/8"	1-1/2"	n/a	n/a	119	36"	18"	22"/24"
ADC075S*	75	1	n/a	2-1/8"	n/a	1-1/2"	UP43-75	30 @ 11'	150	36"	18"	24"
SDC075SO	75	1	n/a	2-1/8"	n/a	1-1/2"	n/a	n/a	128	36"	18"	24"
ADC080S/D*	80	1	2	2-1/8"	1-5/8"	1-5/8"	UP43-75	32 @ 9.5'	171	36"	18"	26"/28"
SDC080S/DO	80	1	2	2-5/8"	1-5/8"	2"	n/a	n/a	147	36"	18"	26"/28"
ADC0100S/D*	100	1	2	2-5/8"	1-5/8"	2"	(2) UP43-75	40 @ 8.4'	223	38"	18"	34"/38"
SDC0100S/DO	100	1	2	2-5/8"	1-5/8"	2"	n/a	n/a	190	38"	18"	34"/38"

* Specify Pump Voltage - 0 = No pump
 1 = 115VAC
 2 = 230VAC
 Consult factory for special pumps

- ¹ SDC Models - No pump or controls
- ² Standard Refrigerant Line Size - Other sizes available; consult factory
- ³ Standard Water Line Size - Other sizes available, consult factory
- ⁴ Standard Pump (Taco or Grundfos) - Consult factory for special pumping needs
- ⁵ Approximate maximum dimensions for standard unit. Larger lines or pumps may increase dimensions
- ⁶ Single Refrigerant Circuit
- ⁷ Dual Refrigerant Circuit

Sample Savings Estimates

Refrigerant Desuperheater Waste Heat Recovery Unit

Model Number _____

GENERAL

The mechanical equipment supplier/contractor shall provide and install a refrigerant desuperheater water heater unit with the mechanical equipment on:

Unit Number _____ Tons/HP _____

Unit Number _____ Tons/HP _____

CONSTRUCTION

The desuperheater heat exchanger shall be counter-flow, coaxial (tube-in-tube) design with double-walled and vented inner tube*. Heat exchanger shall be factory pressure and leak tested to 450 psig on the refrigerant side and 150 psig on the water side. Heat exchanger assembly shall be insulated and enclosed in a weather-resistant .040" aluminum cabinet.

PERFORMANCE

The desuperheater shall be capable of recovering _____ BTUH based on a water flow rate of _____ GPM entering at _____ °F and entering refrigerant temperature of _____ °K. The heat exchanger shall be capable of receiving full flow from the refrigerant compressor and shall not exceed 6.0 psig pressure drop.

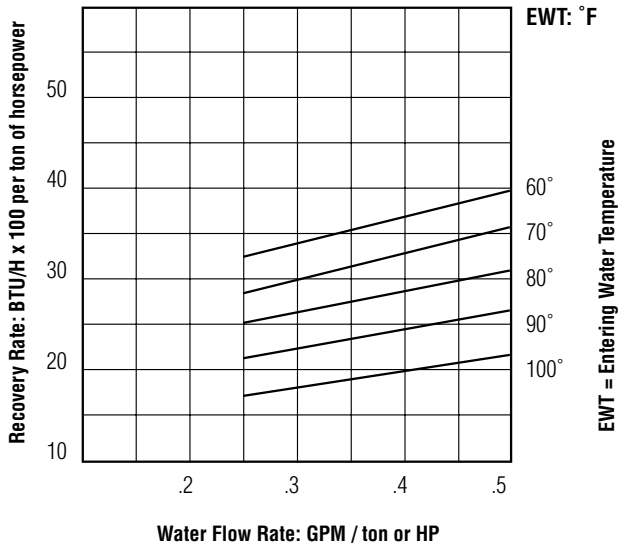
PUMP AND CONTROLS

The circulator pump shall be maintenance-free, in-line, single stage, wet rotor type capable of delivering _____ GPM at _____ feet of head. The pump volute shall be constructed of stainless steel or bronze, rated at 145 psi working pressure and suitable for use in potable hot water systems. Motor shall be _____ volts, single phase, _____ Hz, and shall be equipped with thermal overload protection. Pump operation shall be controlled by a water limit thermostat.

Technical Data

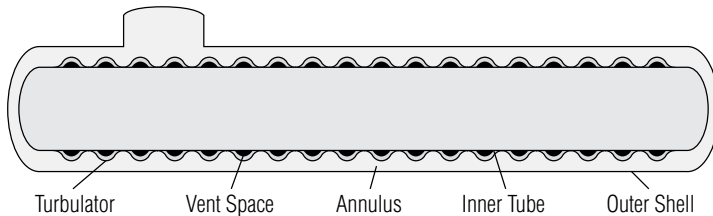
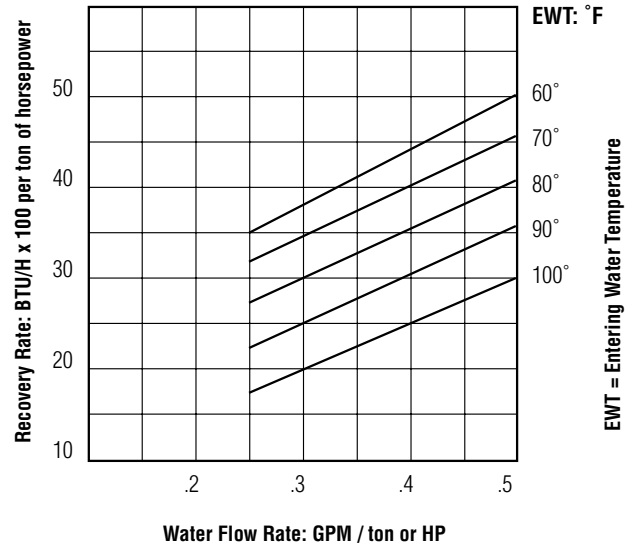
Typical for Water-Source Units

Based on R-22, 185°F Discharge Temperature
105°F CTP - 15,000 BTUH-THR



Typical for Air-Cooled Units

Based on R-22, 210°F Discharge Temperature
125°F CTP - 16,000 BTUH-THR



- Surface enhanced for high efficiency
- Prevents contamination of refrigerant gas and water supply
- Protects refrigeration compressor
- Positive vented to the atmosphere for quick leak detection
- Meets code requirements for potable and process water
- U.L. Listed

MODEL NOMENCLATURE

XX	C	XXX	X	X
AD Active Desuperheater with pump and controls	C Chemical cleanable water tubes	005 = 5 010 = 10 015 = 15 Applicable compressor tons or horsepower	S Single Refrigerant Circuit	0 = No pump 1 = 115 VAC 2 = 230 VAC Pump voltage
SD Slave desuperheater no pump or controls			D Double Refrigerant Circuits	

Sample Savings Estimates

	Natural Gas @ \$0.50 / Therm	Propane @ \$0.90 / Gallon	Electricity @ \$0.97 KWH
Full-Service Restaurant			
500 Meals Per Day	\$160.00 per month	\$310.00 per month	\$461.70 per month
Junior/Senior High School			
1,000 Students	\$172.00 per month	\$331.20 per month	\$492.80 per month
Motel/Hotel			
150 Room	\$193.50 per month	\$372.60 per month	\$554.40 per month

Actual savings may vary. Consult factory for detailed audit and sizing form.

Typical Single Desuperheater Connected to Preheat Tank

