

ECOCHILL™ SURNA HEAT RECOVERY CHILLER

MODELS SHRC

When 4-pipe systems are applied in a controlled environment agriculture (CEA) setting, there is a constant requirement for the production of both chilled and hot water simultaneously for dehumidification control at the terminal units. These Surna heat recovery chillers (SHRC) save energy by producing both chilled and hot water at the same time.

The controls and refrigeration components including compressors can be serviced from the front of the unit. The heat exchangers can be serviced by sliding out one unit without disruption of service to the other units.

Because they produce both chilled and hot water simultaneously, these units can reduce the capacity requirements and energy consumption versus traditional 4-pipe chilled water systems. The unit's standard range of operation: up to 135 °F (57.2 °C) hot water supply and 40 °F (4.4 °C) chilled water supply temperature. All unit operations are based on heating or cooling setpoints. Setpoints are adjustable via display, BACnet, Modbus RTU, or 0-5V DC signal.

All SHRC units include:

- Insulated, off white powder coated, metal cabinets
- Scroll compressors with R410A refrigerant
- A standalone microprocessor control with LCD display
- Phase reversal and loss of phase protection
 module
- · Individual motor protection and dual circuits
- Thermal expansion valves as standard

FEATURES AND BENEFITS

Energy Efficient

When properly designed into a 4-pipe system, by virtue of capturing rather than rejecting waste heat from the chiller process, facility central plant COP (coefficient of performance) can achieve much higher levels than even the most efficient stand alone chillers and boilers.

Easy Installation

SHRC units can be brought in through a standard door or elevator and assembled in banks on site. An optional factorymade header assembly can be provided.

Modular

Surna units are truly modular. They can be installed an inch apart from each other. Each unit can be removed from the bank without service disruption to the other units.

SHRC-175 SPECIFICATIONS

		Mode	el		SHRC-175
	Cooling	Cooling Capacity	,	BTU/hr	113360 (33.2)
	Heating	Heating Capacity	/	(kW)	155737 (45.6)
		Heating Nominal Fl	ow	GPM (L/h)	18.8 (4269.9)
Data	<u>.</u> U	Hot Water Heat Exchanger Pressure Drop @ Above GPM		Ft/Head (kPa)	8.8 (26.3)
ance [ydroni	Cooling Nominal Flow		GPM (L/h)	24 (5451)
Perform	T	Chilled Water Heat Exchanger Pressure Drop @ Above GPM		Ft/Head (kPa)	14.4 (43.0)
		Refrigerant Charge Limit (+/-5%)		Oz (kg)	160 (4.54)
		Power Supply		(V/Ph/Hz)	460/3/60
	_۳	Rated Load Amps (RLA) @ 460/3/60			19
	lectrica	Min. Circuit Ampaci (MCA) @ 460/3/6	ity 0	А	23.2
	ш	Max. Overcurrent Protection (MOP) @ 460/3/60			40
				Туре	NPT Groove Mechanical Fittings
	Jala	Water Connections	ln Out		NPT 1-1/2 (38.1)
	ן ק		L	In (mm)	31-11/16 (804.9)
	ls	Dimensions	W		12-13/16 (325.4)
Ċ	Ī		Н	1	57-15/16 (1471.6)
		Net Weight		Lbs (ka)	545 (2472)
		Certifications			UL

Table 1: SHRC-175 specifications

Note: a. Entering condenser water temperature: 110°F (43.3°C). C. Entering evaporator water temperature: 52°F (11.1°C).

d All dimensions are approximate within 1/16 of an inch of those indicated.

b. Leaving hot water temperature:

d. Leaving chilled water temperature: 42°F (5.6°C).

e. Data based on 460/3/60 configuration.

130°F (54.4°C). **OTHER ELECTRICAL DATA**

		Model		SHRC-175
Hz)	208/3/60	RLA	- A -	48
/h/l		MCA		60.1
ly (<		MOP		100
ver Supp	50	RLA		15
	5/3/(MCA		18.4
Po	575	MOP		30

Table 2: SHRC-175 electrical data





ALL CONNECTIONS - 1.5" GROOVE MECHANICAL FITTINGS					
T1	OUT	Condensor/heatier			
Т2	IN	Condenser/ neating			
T3	OUT	For a state of a solid state			
T4	IN	Evaporatof/Cooling			

Table 3: SHRC-175 connections

SHRC-210 TO 450 SPECIFICATIONS

		Model		SHRC-210	SHRC-230	SHRC-260	SHRC-300	SHRC-350	SHRC-400	SHRC-450	
	Cooling	Cooling Capacity	/	BTU/hr	137054 (40.2)	148687 (43.6)	168010 (49.2)	202965 (59.5)	226938 (66.5)	255219 (74.8)	297631 (82.2)
	Heating	Heating Capacity	/	(kW)	189617 (55.6)	207001 (60.7)	235551 (69.0)	279689 (82.0)	311034 (91.2)	350309 (102.7)	408762 (119.8)
		Heating Nominal Fl	ow	GPM (L/h)	22.5 (5110.3)	24 (5451)	27 (6132.4)	33 (7495.1)	37.5 (8517.2)	42 (9539.2)	48 (10902)
Data	<u>.</u>	Hot Water Heat Exchanger Pressure [@ Above GPM	Drop	Ft/Head (kPa)	7.1 (21.2)	8.1 (24.2)	10.8 (32.3)	6.8 (20.3)	10.1 (30.2)	13.2 (39.4)	8.1 (24.2)
ance [lydroni	Cooling Nominal Flo	ow	GPM (L/h)	29.1 (6609.3)	31.7 (7199.9)	35.6 (8085.6)	43.1 (9789.1)	48.5 (11015.5)	54.3 (12332.9)	63.4 (14399.7)
Perform	Т	Chilled Water Hea Exchanger Pressure [@ Above GPM	at Drop	Ft/Head (kPa)	11.9 (35.6)	14.2 (42.4)	18.8 (56.2)	11.7 (35.0)	16.9 (50.5)	22.0 (65.7)	14.2 (42.4)
		Refrigerant Charge Limit (+/-5%)		Oz (kg)	120 (3.4) x2 circuits	135 (3.83) x2 circuits	135 (3.83) x2 circuits	155 (4.39) x2 circuits	170(4.82) x2 circuits	185 (5.24) x2 circuits	200 (5.67) x2 circuits
		Power Supply		(V/Ph/Hz)				460/3/60			
	Ы	Rated Load Amps (R @ 460/3/60	rla)		24.4	29.4	33.4	35.9	37.2	46.1	53.8
	lectrica	Min. Circuit Ampac (MCA) @ 460/3/6	ity 60	А	27.5	33.1	37.6	40.4	41.8	51.9	60.6
	ш	Max. Overcurrent Protection (MOP) @ 460/3/60			35	45	50	50	60	70	80
				Туре	NPT Groove Mechanical Fittings						
	ימומ	Water Connections	ln Out					NPT 2 (50.8)			
	ק		L	In (mm)				36-3/4 (933.5)			
	lick	Dimensions	W					32-3/16 (817.6)			
	Ē		Н					59-3/16 (1503.4)			
		Net Weiaht		Lbs (ka)	950 (430,9)	970 (440)	1000 (453.6)	1025 (464,9)	1175 (533)	1185 (537,5)	1200 (544,3)
		Certifications		,		/		UL	- ()	/	
Ceruncations					UL UL						

Table 4: SHRC-210 to 450 specifications

Note:

a. Entering condenser water temperature: 110°F (43.3°C). c. Entering evaporator water temperature: 52°F (11.1°C).

d All dimensions are approximate within 1/16 of an inch of those indicated.

b. Leaving hot water temperature: 130°F (54.4°C).

d. Leaving chilled water temperature: 42°F (5.6°C).

e. Data based on 460/3/60 configuration.

OTHER ELECTRICAL DATA

		Model		SHRC-210	SHRC-230	SHRC-260	SHRC-300	SHRC-350	SHRC-400	SHRC-450
ver Supply (V/Ph/Hz)	60	RLA	-	50.1	59.1	60.3	66.6	96.2	102.5	111.5
	8/3/	MCA		56.3	66.4	67.8	74.9	108.2	115.3	125.4
	20	MOP		80	90	90	100	150	150	175
	50	RLA		17.9	24.4	24.4	25.7	28.9	33.1	44.6
	5/3/(MCA		20.2	27.5	27.5	28.9	33.1	44.6	53.3
Pov	57	MOP		25	35	35	40	45	60	70

Table 5: SHRC-210 to 450 electrical data





ALL CONNECTIONS - 2.0" GROOVE MECHANICAL FITTINGS					
T1	OUT	Condensor // section			
T2	IN	Condenser/neating			
ТЗ	OUT				
Т4	IN	Evaporator/Cooling			

Table 6: SHRC-210 to 450 connections

SHRC-600 TO 900 SPECIFICATIONS

		Model			SHRC-600	SHRC-700	SHRC-900			
	Cooling	Cooling Capacity	,	BTU/hr	376153 (110.2)	454795 (133.3)	594178 (174.1)			
:	Heating	Heating Capacity	/	(kW)	526582 (154.30)	650217 (190.6)	850983 (249.4)			
		Heating Nominal Flo	ow	GPM (L/h)	60 (13627.5)	75 (17034.4)	90 (20441.2)			
Data	<u>ں</u>	Hot Water Heat Exchanger Pressure Drop @ Above GPM		Ft/Head (kPa)	13.9 (41.5)	13.9 (41.5)	13.9 (41.5)			
ance [lydron	Cooling Nominal Flow		GPM (L/h)	80 (18170)	97 (22031.1)	144 (32706)			
Perform	T (Chilled Water Hea Exchanger Pressure D @ Above GPM	Chilled Water Heat xchanger Pressure Drop @ Above GPM		24.7 (73.8)	23.3 (69.6)	35.6 (106.4)			
		Refrigerant Charge Limit (+/-5%)		Oz (kg)	290 (8.22) x2 circuits	320 (9.07) x2 circuits	500 (14.17) x2 circuits			
		Power Supply (\		(V/Ph/Hz)		460/3/60				
	_	Rated Load Amps (R @ 460/3/60	rla)		62	76	109			
	lectric	Min. Circuit Ampaci (MCA) @ 460/3/6	ity O	A	69.3	85.0	122.6			
	ш	Max. Overcurrent Protection (MOP) @ 460/3/60)					100	100	175
				Туре		NPT Groove Mechanical Fittings				
Data		Water Connections	ln Out		NPT 3 (76.2)					
	ľ		L	In (mm)		52-1/16 (1322.4)				
Jysid		Dimensions	W			34-7/16 (874.7)				
à		Í	Н			76-7/16 (1941.5)				
	ľ	Net Weight		Lbs (kg)	1800 (816.5)	1900 (861.8)	2000 (907.2)			
		Certifications			UL					

Table 7: SHRC-600 to 900 specifications

Note:

a. Entering condenser water temperature: c. Entering evaporator water temperature: 110°F (43.3°C).

52°F (11.1°C).

d All dimensions are approximate within 1/16 of an inch of those indicated.

b. Leaving hot water temperature: 130°F (54.4°C).

d. Leaving chilled water temperature: 42°F (5.6°C).

e. Data based on 460/3/60 configuration.

ELECTRICAL DATA

		Model		SHRC-600	SHRC-700	SHRC-900
Hz)	60	RLA		145	171	219
/HH/	208/3/	MCA	A	163	191.8	246.5
ly (V		MOP		225	250	250
ddng	00	RLA		50	69	99
ver 9	5/3/(MCA		56.3	77.9	111.1
Po	57	MOP		80	100	150

Table 8: SHRC-600 to 900 electrical data





ALL CONNECTIONS - 3.0" GROOVE MECHANICAL FITTINGS					
T1	OUT	Can den eau/le active a			
T2	IN	Condenser/neating			
ТЗ	OUT				
Т4	IN	Evaporator/cooling			

Table 9: SHRC-600 to 900 connections

MULTIPLE UNIT ASSEMBLY

Multiple units can be assembled on site easily and quickly to operate as a bank of chillers. Individual units can be removed from the chiller bank, without causing a service disruption to the other operating units. As an option, a factory made header assembly can be provided for field assembly.

100-3/4 in (2559.1 mm)





The header system can be pre-piped at the factory and shipped for field installation to the Surna units.

Up to 8 modules (Series 1-2) Up to 5 modules (Series 3)

Header ships separately.



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59-3/16 in (1503.4 mm)



Figure 4: SHRC multiple unit assembly dimensions

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February 2022 All data subject to change without notice