BOSCH GUIDE SPECIFICATIONS

TW Series Two Stage Water-to-Water Reverse Cycle Chillers & Low Temp Boilers

TW025-122 Reverse Cycle Chillers / Low Temperature Boilers

GENERAL

Units shall be Underwriter Laboratories (UL) listed for safety on all models. Each unit shall be run tested at the factory, pallet mounted and stretch wrapped. The units shall be manufactured in an ISO 9001:2000 certified facility, designed to operate with entering fluid temperatures between 20˚F (-7˚C) and 120˚F (49˚C) as manufactured by Bosch in Fort Lauderdale, Florida. Refrigerant shall be R-410A.

CASING & CABINET

The cabinet shall be fabricated from heavy gauge steel finished with a vinyl coated black cabinet and a silver brushed aluminum front panel. The interior shall be insulated with ½" (12.7mm) thick foil faced glass fiber. All units shall allow sufficient service access to replace the compressor without unit removal. The compressor shall be covered with a multi-density sound absorbing blanket and have a floating base pan to minimize noise transmission.

REFRIGERATION CIRCUITS

All units shall contain a hermetically sealed refrigerant circuit(s) including two stage operation, scroll compressor(s), bidirectional thermal expansion valve metering device, coaxial style fluid-to-refrigerant heat exchangers, refrigerant reversing valve and service ports. Compressor shall be high efficiency, two stage scroll type (except TW122 which contains single stage scrolls compressor but has two refrigeration circuits), designed for heat pump duty, quiet operation and mounted on rubber vibration isolators. Compressor motors shall be equipped with overload protection. Refrigerant reversing valves shall be pilot operated sliding piston type with replaceable encapsulated magnetic coils energized only during the chiller cycle. The coaxial water-to-refrigerant heat exchanger shall be constructed of a convoluted copper (optional cupronickel) inner tube and steel outer tube with a designed refrigerant working pressure of 600 PSIG (4100kPa) and a designed water side working pressure of no less than 400 PSIG (2750kPa). Due to their susceptibility to fouling, brazed plate heat exchangers are not acceptable. The fluid-to-refrigerant heat exchangers shall be insulated to prevent condensation at low fluid temperatures.

ELECTRICAL

Controls and safety devices will be factory wired and mounted within the unit. Controls shall include comfort alert module, compressor contactor, 24V transformer, reversing valve coil and solid state lockout controller (UPM) The UPM controller shall include the following features: Anti-short cycle time delay, random start, brown out/surge/power interruption protection, 120 second low pressure switch bypass timer, shutdown on high or low refrigerant pressure safety switch inputs, shutdown for the optional freezestat, 24 VAC alarm output for remote fault indication, unit reset at thermostat or disconnect, ability to defeat time delays for servicing and automatic intelligent reset. The UPM shall automatically reset after a safety shut down and restart the unit, if the cause of the shut down no longer exists, after the anti-short cycle and random start timers expire. Should a fault re-occur within 60 minutes after reset, then a permanent lockout will occur. A light emitting diode (LED) shall annunciate the following alarms: high refrigerant pressure, low refrigerant pressure and low water temperature (when equipped with the optional low water temperature sensor). The LED will display each fault condition as soon as the fault occurs. If a permanent lockout occurs, then the fault LED will display the type of fault until the unit is reset.

Safety devices include a low pressure cutout set a 40 PSIG (280 kPa) for loss of charge protection (freezestat and/or high discharge gas temperature sensor are not acceptable) and a high pressure cutout control set at 600 PSIG (4100 kPa). An optional energy management relay that allows unit control by an external source shall be factory installed. A terminal block with screw terminals shall be provided for control wiring.

PIPING

Water piping connections shall be female pipe thread with a single set of source and load connections flush mounted to the unit cabinet.

HEAT RECOVERY PACKAGE

208/230 volt units shall be equipped with an optional factory installed internal heat recovery kit for domestic hot water production. This kit shall include a vented, double walled coaxial water to refrigerant heat exchanger, circuit breaker protected circulating pump, high water temperature safety cutoff and a low refrigerant temperature cutout.

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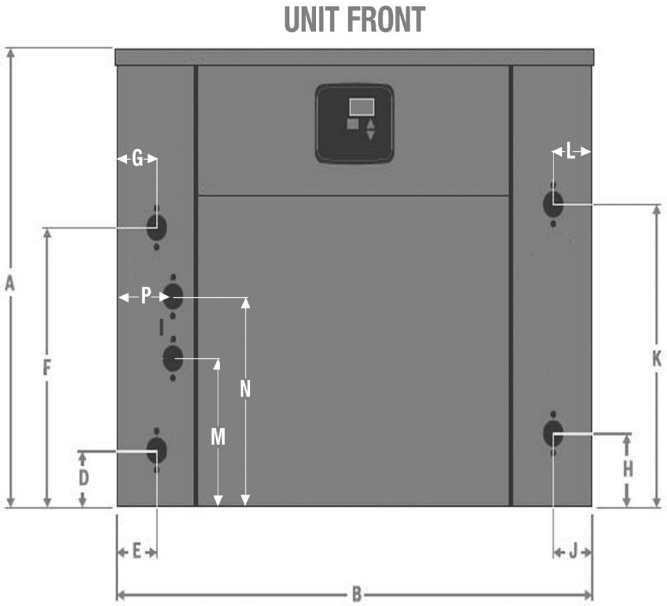
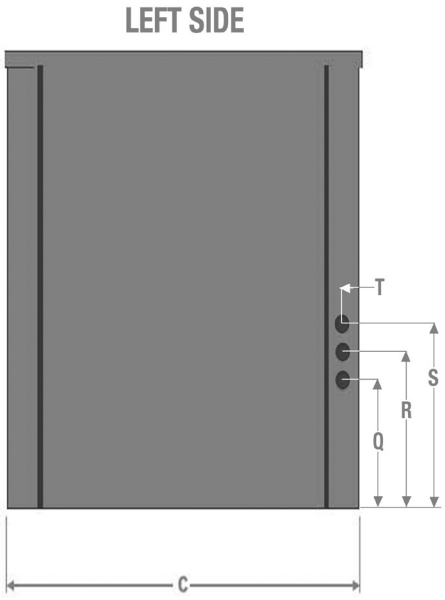
TW025-071 Series
Two Stage Reverse Cycle Chillers

MODEL	Dimensions																			
	A Height	B Width	C Depth	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	Water Conn.	HRP Conn.
TW025	24.12	32.50	24.00	2.70	2.50	13.70	2.50	3.25	1.95	14.25	1.95	7.15	11.00	4.25	6.55	8.05	9.55	1.25	3/4 FTP	1/2 FPT
TW035	24.12	32.50	24.00	2.30	2.30	14.30	2.35	3.70	2.55	15.70	2.55	7.15	11.00	4.25	6.55	8.05	9.55	1.25	3/4 FTP	1/2 FPT
TW049	24.12	32.50	24.00	2.30	2.60	14.30	2.65	3.70	2.65	15.70	2.65	7.15	11.00	4.25	6.55	8.05	9.55	1.25	1 FPT	1/2 FPT
TW061	24.12	32.50	24.00	2.30	2.60	14.30	2.65	3.20	2.65	15.20	2.65	7.15	11.00	4.25	6.55	8.05	9.55	1.25	1 FPT	1/2 FPT
TW071	24.12	32.50	24.00	3.00	2.25	17.25	2.25	3.25	2.25	17.00	2.25	7.15	11.00	4.25	6.55	8.05	9.55	1.25	1 FPT	1/2 FPT





TW Series Reverse Cycle Chiller Nomenclature

TW___-___-___

Series:
TW-Water-to-Water

Nominal Capacity:

Voltage:
1-208/230-1-60

Cabinet Type:
CS-Remote Control
US-Unit Mounted Controller

Condenser Material:
C-Copper
N-Cupro-Nickel

Water Connections:
F-Front

Return Air Location:
X-None

Supply Air Location:
X-None

BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS
SPECIFICATION DATA SHEET

TW061
TW SERIES

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	27.1	152.9	33.9	60

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
7.5	4.44	7.5	4.02
10.0	7.50	10.0	6.79
12.5	11.24	12.5	10.17
15.0	15.64	15.0	14.16
20.0	26.32	20.0	23.83

c UL US

CHILLER PERFORMANCE - PART LOAD

Based on 10.5 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (°F)	Entering Source Fluid (°F)	Total **Capacity** (Tons)	Total **Capacity** (MBtuH)	Power **Input** (kW)	EER	Heat Rejection (MBtuH)
40°	75°	2.99	35.88	2.10	17.11	43.03
	80°	2.90	34.78	2.24	15.51	42.43
	85°	2.80	33.64	2.40	14.03	41.82
	90°	2.70	32.44	2.56	12.66	41.19
	95°	2.60	31.18	2.74	11.39	40.52
42°	75°	3.11	37.35	2.09	17.88	44.47
	80°	3.02	36.22	2.23	16.21	43.84
	85°	2.92	35.05	2.39	14.67	43.20
	90°	2.82	33.83	2.55	13.24	42.54
	95°	2.71	32.54	2.73	11.92	41.85
44°	75°	3.24	38.85	2.08	18.68	45.95
	80°	3.14	37.70	2.23	16.93	45.29
	85°	3.04	36.50	2.38	15.32	44.62
	90°	2.94	35.25	2.55	13.84	43.93
	95°	2.83	33.93	2.72	12.46	43.22
45°	75°	3.30	39.63	2.08	19.09	46.71
	80°	3.20	38.45	2.22	17.30	46.03
	85°	3.10	37.23	2.38	15.66	45.35
	90°	3.00	35.97	2.54	14.14	44.64
	95°	2.89	34.64	2.72	12.74	43.91
46°	75°	3.37	40.41	2.07	19.50	47.47
	80°	3.27	39.23	2.22	17.70	46.80
	85°	3.16	37.96	2.37	16.00	46.06
	90°	3.06	36.70	2.54	14.50	45.37
	95°	2.94	35.33	2.72	13.00	44.60
48°	75°	3.50	42.00	2.06	20.37	49.03
	80°	3.40	40.77	2.21	18.45	48.31
	85°	3.29	39.50	2.37	16.70	47.57
	90°	3.18	38.19	2.53	15.09	46.82
	95°	3.07	36.81	2.71	13.60	46.05
50°	75°	3.64	43.64	2.05	21.26	50.64
	80°	3.53	42.37	2.20	19.25	49.88
	85°	3.42	41.06	2.36	17.42	49.10
	90°	3.31	39.71	2.52	15.74	48.32
	95°	3.19	38.30	2.70	14.19	47.51

HEATING PERFORMANCE

Based on 10°F load temp. rise & 10.5 GPM source fluid flow.

Capacity		**Abs.**			
		34.79	2.74	3.73	25.46
		37.59	2.70	4.07	28.37
		43.63	2.63	4.85	34.64
		50.31	2.56	5.76	41.58
		57.70	2.48	6.82	49.24
		33.74	3.13	3.15	23.04
		36.49	3.10	3.45	25.92
		42.38	3.02	4.11	32.08
		48.85	2.94	4.87	38.83
		55.96	2.85	5.75	46.22
		32.47	3.60	2.64	20.18
		35.19	3.56	2.90	23.05
		40.96	3.47	3.46	29.13
		47.24	3.37	4.10	35.72
		54.08	3.28	4.83	42.88
		31.74	3.87	2.41	18.55
		34.45	3.82	2.64	21.42
		40.17	3.72	3.17	27.48
		46.36	3.62	3.75	34.01
		53.08	3.52	4.42	41.07

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

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BOSCH WATER COOLED CHILLERS AND LOW TEMP BOILERS
SPECIFICATION DATA SHEET

TW061
TW SERIES

ELECTRICAL SPECIFICATIONS

Electrical Characteristics	Elect. Symbol	Compressor		Min. Circuit Ampacity	Max. Fuse Size
		RLA	LRA		
208/230-1-60	-1	27.1	152.9	33.9	60

FLUID FLOW & PRESSURE DROP

Chilled Fluid Side (@ 55°F)		Cond. Fluid Side (@ 85°F)	
Flow (GPM)	ΔP (FOH)	Flow (GPM)	ΔP (FOH)
7.5	4.42	7.5	3.99
10.0	7.46	10.0	6.74
12.5	11.20	12.5	10.13
15.0	15.59	15.0	14.10
20.0	26.26	20.0	23.76

c UL US

CHILLER PERFORMANCE - FULL LOAD

Based on 10.5 GPM chilled fluid & 10°F condenser fluid temp. rise.

Leaving Load Fluid (˚F)	Entering Source Fluid (˚F)	Total **Capacity** (Tons)	Total **Capacity** (MBtuH)	Power **Input** (kW)	EER	Heat Rejection (MBtuH)
40°	75°	4.06	48.67	3.34	14.56	60.07
	80°	3.95	47.43	3.54	13.40	59.51
	85°	3.85	46.15	3.75	12.31	58.95
	90°	3.74	44.82	3.98	11.27	58.39
	95°	3.62	43.44	4.22	10.29	57.84
42°	75°	4.20	50.43	3.35	15.04	61.88
	80°	4.10	49.16	3.55	13.85	61.27
	85°	3.99	47.83	3.76	12.72	60.66
	90°	3.87	46.45	3.99	11.65	60.06
	95°	3.75	45.02	4.23	10.64	59.46
44°	75°	4.35	52.24	3.37	15.52	63.73
	80°	4.24	50.92	3.56	14.30	63.07
	85°	4.13	49.54	3.77	13.13	62.41
	90°	4.01	48.12	4.00	12.03	61.76
	95°	3.89	46.64	4.24	10.99	61.12
45°	75°	4.43	53.16	3.37	15.76	64.66
	80°	4.32	51.81	3.57	14.52	63.98
	85°	4.20	50.41	3.78	13.35	63.30
	90°	4.08	48.97	4.00	12.23	62.63
	95°	3.96	47.46	4.25	11.17	61.96
46°	75°	4.51	54.08	3.38	16.00	65.61
	80°	4.41	52.91	3.58	14.80	65.11
	85°	4.28	51.32	3.78	13.60	64.23
	90°	4.15	49.83	4.01	12.40	63.51
	95°	4.02	48.30	4.25	11.40	62.81
48°	75°	4.66	55.97	3.39	16.50	67.54
	80°	4.55	54.55	3.59	15.21	66.78
	85°	4.42	53.08	3.80	13.98	66.03
	90°	4.30	51.56	4.02	12.82	65.28
	95°	4.17	49.99	4.27	11.72	64.54
50°	75°	4.82	57.89	3.41	17.00	69.50
	80°	4.70	56.42	3.60	15.68	68.70
	85°	4.58	54.90	3.81	14.42	67.90
	90°	4.44	53.34	4.03	13.22	67.10
	95°	4.31	51.71	4.28	12.09	66.31

HEATING PERFORMANCE

Based on 10°F load temp. rise & 10.5 GPM source fluid flow.

Leaving Load Fluid (˚F)	Entering Source Fluid (˚F)	Total **Capacity** (MBtuH)	Power Input (kW)	COP	Heat of **Abs.** (MBtuH)
100°	35°	49.67	3.99	3.65	36.06
	40°	52.97	3.99	3.90	39.37
	50°	60.12	3.97	4.43	46.56
	60°	68.00	3.96	5.03	54.47
	70°	76.59	3.96	5.67	63.08
110°	35°	49.31	4.51	3.20	33.93
	40°	52.46	4.51	3.41	37.08
	50°	59.27	4.49	3.87	43.95
	60°	66.79	4.47	4.38	51.53
	70°	75.00	4.46	4.93	59.79
120°	35°	49.00	5.11	2.81	31.56
	40°	51.98	5.11	2.98	34.56
	50°	58.46	5.09	3.37	41.10
	60°	65.60	5.06	3.80	48.32
	70°	73.42	5.04	4.27	56.22
125°	35°	48.86	5.44	2.63	30.29
	40°	51.76	5.44	2.79	33.21
	50°	58.06	5.42	3.14	39.57
	60°	65.02	5.40	3.53	46.61
	70°	72.64	5.37	3.97	54.32

Units are complete packages featuring 2 stage operation and containing refrigeration compressor, reversing valve, expansion valve metering device and water to refrigerant heat exchangers. Also included are safety controls: Overload protection for compressor, high and low refrigerant pressure switches and a lock-out control circuit.

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