THERMAL CARE

Superior equipment, Exceptional service

Product Catalog

TSE Series Scroll Central Chillers

Contents

Standard Features

Direct Drive Scroll Compressors
Direct-drive hermetically sealed scroll compressors with proven performance in industrial cooling for reliable, low maintenance, and efficient operation.

Stainless Steel Evaporator
High-efficiency stainless steel plates with copper brazing provide maximum performance, long life, and an enhanced level of protection from harsh process conditions.

Evaporator Inlet Strainer
The evaporator inlet strainer removes any debris present in the process fluid to prevent costly downtime and repair due to a clogged chiller evaporator.

Fits through Doors
Single circuit chillers up to 80 tons are compact and easily fit through standard 36-inch wide doors for easy maneuvering into tight installation spaces.

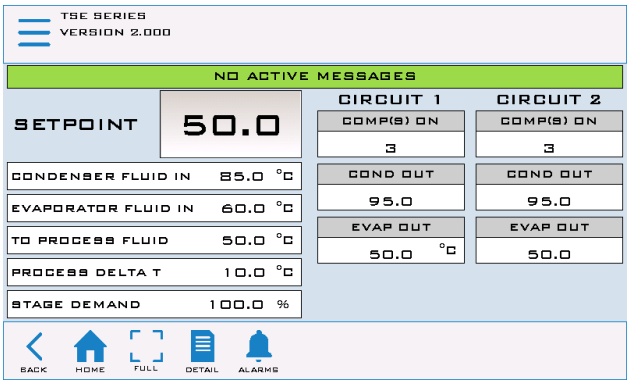
Dual Circuit Manifolds
Dual circuit chillers include evaporator manifolds and water-cooled condenser units include condenser water manifolds for quick and easy installation.

Modular Expandable System
Our modular system design provides for system expansion to over 1,000 tons using up to six chillers and twelve refrigeration circuits.

Single or Multiple Circuit Configurations
Dual-circuit chillers for redundancy and back up of critical processes or systems and single-circuit chillers for dedicated loads.

UL 508A Industrial Control Panel
Every chiller has a UL label certifying our panel design and components comply with UL 508A standards ensuring the panels are safe and consistent for reliable operation.

Color Touch-Screen Display
A high-resolution, high-speed, 7-inch color touch-screen with English text clearly shows chiller operation for quick and easy monitoring and control of the system.



Standard PLC Home Screen

CONNEX4.0 Ready Controls
Every chiller is equipped with an Ethernet port and is fully compatible with the CONNEX4.0 plant-wide equipment control and monitoring system.

Warranty
3 year PLC controller parts
1 year entire unit parts
1 year labor
One-day factory authorized start-up supervision

Available Options

Integral Reservoir and Pumping System
An integral stainless steel reservoir and pumping system all piped, insulated, and wired to the chiller control panel for a quick and easy complete chilled water system installation. Available on chillers up to 160 tons.

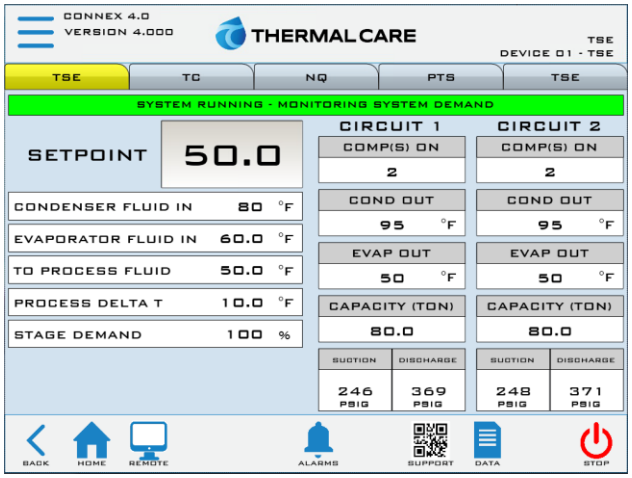
Rotary Non-Fused Disconnect Switch
Adds a 5 kA SCCR (Short Circuit Current Rating) rotary non-fused disconnect switch to the control panel for safe lockout of main power.

10-inch HMI
Replaces the standard 7-inch screen with a 10-inch, high resolution, color screen for larger presentation of the same menus and functions as the standard screen.

12 inch HMI
Replaces the standard 7-inch screen with a 12-inch, high resolution, color screen with a built-in industrial computer to allow for remote monitoring and control using Teamviewer software installed on any remote Windows based PC or smart phone.

12-inch HMI and CONNEX4.0 Master Controller

Replaces the standard 7-inch screen with a 12-inch, high resolution, color screen with a built-in industrial computer to allow for remote monitoring and control using Teamviewer software installed on any remote Windows based PC or smart phone. This package also adds a second PLC to allow for connection of up to 15 total Thermal Care Connex4.0 ready devices for many ways to interact with the connected equipment such as smart phone/tablet control, configurable email and text alerts for alarms, warnings, event alerts, and data collection.



BACnet or Lon Works Communications Port

Adds a ModBUS to BACnet or Lon Works gateway which is wired to a RS-485 connector on the chiller control panel.

Hot Gas Bypass Valve

For applications with sudden batch loads or prolonged periods of extremely low loads, a hot-gas bypass valve is available to provide an added level of unloading and temperature control beyond compressor staging.

Condenser Coil Coating

For applications where a chiller with a remote air-cooled condenser is in an area within 10 miles of a saltwater coast, this option provides an added level of protection for the aluminum condenser coil from possible corrosion from salt air.

Physical Data

Water-Cooled Condenser Single-Circuit Chillers

	TSEW 10S	TSEW 15S	TSEW 20S	TSEW 25S	TSEW 30S	TSEW 40S	TSEW 50S	TSEW 60S	TSEW 80S	TSEW 100S	TSEW 120S
Cooling Capacity (tons)[1]	11	16	22	27	32	42	53	69	86	110	128
Set Point Range (°F)	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80
Compressors (qty)	2	2	2	2	2	2	2	2	2	3	3
Process In/Out (in) – std	1½	1½	2	2	2½	2½	3	4	4	4	4
w/high flow evaporator	2	2½	2½	3	3	4	4	4	n/a	6	6
Condenser In/Out (in)	1½	2	2	2½	2½	3	3	4	4	4	4
Chiller											
Length (in)	68	72	75	75	77	102	92	102	102	123	125
Width (in)	30	30	30	30	30	30	36	36	36	30	30
Height (in)	68	68	68	68	68	68	68	68	68	70	71
Ship Weight (lbs)	990	1,072	1,149	1,189	1,339	1,763	1,802	2,294	2,467	3,230	3,250
Operating Weight (lbs)	1,005	1,092	1,179	1,222	1,376	1,823	1,872	2,380	2,557	3,330	3,350
Chiller with Standard Flow Reservoir Option											
Reservoir Capacity (gal)	275	275	275	275	275	275	275	450	450	The TSEW100S and TSEW120S are not available with an integral reservoir	
Process / Chiller Pump (hp)	5/1.5	5/1.5	5/1.5	5/1.5	7.5/2	10/2	10/3	10/3	15/3		
Process Connection Size (in)	1½	1½	2	2	2½	2½	3	3	4		
Condenser In/Out (in)	1½	2	2	2½	2½	3	3	4	4		
Length (in)	99	99	99	99	99	99	102	114	114		
Width (in)	68	72	75	75	78	98	102	101	101		
Height (in)	73	73	73	73	73	73	73	73	73		
Ship Weight (lbs)	2,337	2,418	2,496	2,537	2,769	3,238	3,374	4,147	4,370		
Operating Weight (lbs)	4,631	4,712	4,790	4,831	5,063	5,532	5,668	7,901	8,124		
Chiller with High Flow Reservoir Option											
Reservoir Capacity (gal)	400	400	400	400	400	400	400	650	650	The TSEW100S and TSEW120S are not available with an integral reservoir	
Process/Chiller Pump (hp)	5/1.5	7.5/1.5	10/1.5	10/1.5	10/2	15/2	15/3	20/3	25/3		
Process Connection Size (in)	2	2½	2½	3	3	4	4	4	6		
Condenser In/Out (in)	1½	2	2	2½	2½	3	3	4	4		
Length (in)	99	99	99	99	99	99	102	114	114		
Width (in)	68	72	75	75	78	98	102	101	101		
Height (in)	73	73	73	73	73	73	73	73	73		
Ship Weight (lbs)	2,850	2,950	3,100	3,150	3,450	4,000	4,250	4,950	5,750		
Operating Weight (lbs)	6,200	6,300	6,450	6,500	6,800	7,350	7,600	10,400	11,200		

[1]Cooling capacity when cooling water with 50°F set point, 60°F return, 85°F condenser water, R410A refrigerant.

Water-Cooled Condenser Dual-Circuit Chillers

	TSEW 20D	TSEW 30D	TSEW 40D	TSEW 50D	TSEW 60D	TSEW 80D	TSEW 100D	TSEW 120D	TSEW 160D	TSEW 200D	TSEW 240D
Cooling Capacity (tons)[1]	22	32	44	54	65	84	106	137	171	220	256
Set Point Range (°F)	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80
Compressors Circuit 1 (qty)	2	2	2	2	2	2	2	2	2	3	3
Compressors Circuit 2 (qty)	2	2	2	2	2	2	2	2	2	3	3
Process In/Out (in) – Std	2	2½	2½	3	3	4	4	4	6	6	6
w/high flow evaporator	2½	3	4	4	4	6	6	6	n/a	8	8
Condenser In/Out (in)	2	2½	3	3	4	4	4	6	6	6	6
Chiller											
Length (in)	76	77	80	81	87	117	113	119	120	139	141
Width (in)	48	49	50	50	52	51	52	54	54	60	60
Height (in)	68	68	68	68	68	68	68	68	68	70	71
Ship Weight (lbs)	1,925	2,093	2,255	2,343	2,657	3,516	3,595	4,361	4,736	5.760	5,780
Operating Weight (lbs)	1,955	2,133	2,315	2,409	2,731	3,636	3,735	4,533	4,916	5,960	5,980
Chiller with Standard Flow Reservoir Option											
Reservoir Capacity (gal)	275	275	275	275	450	450	700	700	1,000	The TSEW200D and TSEW240D are not available with an integral reservoir	
Process/Chiller Pump (hp)	5/1.5	7.5/2	10/2	10/3	10/3	15/3	15/5	20/7.5	25/10		
Process Connection Size (in)	2	2½	2½	3	3	4	4	4	6		
Condenser In/Out (in)	2	2½	3	3	4	4	4	6	6		
Length (in)	123	123	123	123	135	135	135	135	148		
Width (in)	74	74	77	78	81	98	102	111[2]	111[2]		
Height (in)	73	73	73	75	75	79	79	79	90		
Ship Weight (lbs)	3,486	3,748	3,948	4,068	4,546	5,390	6,067	7,160	8,168		
Operating Weight (lbs)	5,780	6,042	6,229	6,362	8,300	9,144	11,936	12,999	16,510		
Chiller with High Flow Reservoir Option											
Reservoir Capacity (gal)	400	400	400	400	650	650	1,000	1,000	1,000	The TSEW200D and TSEW240D are not available with an integral reservoir	
Process/Chiller Pump (hp)	10/1.5	10/2	15/2	15/3	20/3	25/3	30/5	40/7.5	40/10		
Process Connection Size (in)	2½	3	4	4	4	6	6	6	6		
Condenser In/Out (in)	2	2½	3	3	4	4	4	6	6		
Length (in)	123	123	123	123	135	135	135	135	148		
Width (in)	74	74	77	78	81	98	102	111[2]	111[2]		
Height (in)	73	73	73	75	75	79	79	79	90		
Ship Weight (lbs)	5,950	6,400	6,750	6,950	8,950	10,300	13,050	14,150	18,500		
Operating Weight (lbs)	7,200	7,650	8,000	8,200	10,900	12,250	16,250	17,250	19,500		

[1]Cooling capacity when cooling water with 50°F set point, 60°F return, 85°F condenser water, R410A refrigerant.

[2]To keep shipping dimensions within the 102" width of a standard flatbed, the condenser inlet manifold ships separately.

Remote Air-Cooled Condenser Single-Circuit Chillers

	TSER 10S	TSER 15S	TSER 20S	TSER 25S	TSER 30S	TSER 40S	TSER 50S	TSER 60S	TSER 80S	TSER 100S	TSER 120S
Cooling Capacity (tons)[1]	10	15	20	25	30	39	49	64	79	101	119
Set Point Range (°F)	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80
Compressors (qty)	2	2	2	2	2	2	2	2	2	3	3
Process In/Out (in) – Std	1½	1½	2	2	2½	2½	3	3	4	4	4
w/high flow evaporator	2	2½	2½	3	3	4	4	4	n/a	6	6
Refrigerant Discharge Line (in)	⅞	1⅛	1⅛	1⅜	1⅜	1⅜	1⅝	1⅝	2⅛	2⅛	2⅛
Refrigerant Liquid Line (in)	⅝	⅞	⅞	1⅛	1⅛	1⅛	1⅛	1⅜	1⅝	2⅛	2⅛
Chiller											
Length (in)	64	65	68	68	74	102	99	102	102	123	125
Width (in)	30	30	30	30	30	30	36	36	36	30	30
Height (in)	68	68	68	68	68	68	68	68	68	64	64
Ship Weight (lbs)	897	1,024	1,060	1,076	1,202	1,554	1,588	1,995	2,161	2,800	2,820
Operating Weight (lbs)	912	1,044	1,090	1,109	1,239	1,614	1,658	2,081	2,251	2,900	2,920
Chiller with Standard Flow Reservoir Option											
Reservoir Capacity (gal)	275	275	275	275	275	275	275	450	450	The TSER100S and TSER120S are not available with an integral reservoir	
Process/Chiller Pump (hp)	5/1.5	5/1.5	5/1.5	5/1.5	7.5/2	10/2	10/3	10/3	15/3		
Process Connection Size (in)	1½	1½	2	2	2½	2½	3	3	4		
Refrigerant Discharge Line (in)	⅞	1⅛	1⅛	1⅜	1⅜	1⅝	1⅝	1⅝	2⅛		
Refrigerant Liquid Line (in)	⅝	⅞	⅞	1⅛	1⅛	1⅛	1⅛	1⅜	1⅝		
Length (in)	99	99	99	99	99	99	102	114	114		
Width (in)	66	66	67	67	71	98	102	101	101		
Height (in)	73	73	73	73	73	73	73	73	73		
Ship Weight (lbs)	2,267	2,370	2,407	2,423	2,628	3,030	3,158	3,846	4,063		
Operating Weight (lbs)	4,561	4,664	4,701	4,717	4,922	5,324	5,452	7,600	7,817		
Chiller with High Flow Reservoir Option											
Reservoir Capacity (gal)	400	400	400	400	400	400	400	650	650	The TSER100S and TSER120S are not available with an integral reservoir	
Process/Chiller Pump (hp)	5/1.5	7.5/1.5	10/1.5	10/1.5	10/2	15/2	15/3	20/3	25/3		
Process Connection Size (in)	2	2½	2½	3	3	4	4	4	6		
Refrigerant Discharge Line (in)	⅞	1⅛	1⅛	1⅜	1⅜	1⅝	1⅝	1⅝	2⅛		
Refrigerant Liquid Line (in)	⅝	⅞	⅞	1⅛	1⅛	1⅛	1⅛	1⅜	1⅝		
Length (in)	99	99	99	99	99	99	102	114	114		
Width (in)	66	66	67	67	71	98	102	101	101		
Height (in)	73	73	73	73	73	73	73	73	73		
Ship Weight (lbs)	2,800	2,950	2,950	3,000	3,300	3,750	4,000	4,600	5,350		
Operating Weight (lbs)	6,150	6,300	6,300	6,350	6,650	7,100	7,350	10,050	10,800		

[1]Cooling capacity when cooling water with 50°F set point, 60°F return, 95°F condenser air, R410A refrigerant.

Remote Air-Cooled Condenser Dual-Circuit Chillers

	TSER 20D	TSER 30D	TSER 40D	TSER 50D	TSER 60D	TSER 80D	TSER 100D	TSER 120D	TSER 160D	TSER 200D	TSER 240D
Cooling Capacity (tons)[1]	20	30	41	50	60	78	98	127	158	201	237
Set Point Range (°F)	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80
Compressors Circuit 1 (qty)	2	2	2	2	2	2	2	2	2	3	3
Compressors Circuit 2 (qty)	2	2	2	2	2	2	2	2	2	3	3
Process In/Out (in) – Std	2	2½	2½	3	3	4	4	4	6	6	6
w/high flow evaporator	2½	3	4	4	4	6	6	6	n/a	8	8
Refrigerant Discharge Line/Circuit (in)	⅞	1⅛	1⅛	1⅜	1⅜	1⅜	1⅝	1⅝	2⅛	2⅛	2⅛
Refrigerant Liquid Line/Circuit (in)	⅝	⅞	⅞	1⅛	1⅛	1⅛	1⅛	1⅜	1⅝	2⅛	2⅛
Chiller											
Length (in)	76	77	80	81	87	117	113	116	120	139	141
Width (in)	48	48	48	48	48	49	49	49	51	60	60
Height (in)	68	68	68	68	68	68	68	68	68	65	65
Ship Weight (lbs)	1,722	1,760	1,834	2,091	2,335	3,061	3,129	3,820	4,069	5,350	5,370
Operating Weight (lbs)	1,752	1,800	1,894	2,157	2,409	3,181	3,269	3,992	4,249	5,550	5,570
Chiller with Standard Flow Reservoir Option											
Reservoir Capacity (gal)	275	275	275	275	450	450	700	700	1,000	The TSER200D and TSER240D are not available with an integral reservoir	
Process/Chiller Pump (hp)	5/1.5	7.5/2	10/2	10/3	10/3	15/3	15/5	20/7.5	25/10		
Process Connection Size (in)	2	2½	2½	3	3	4	4	4	6		
Refrigerant Discharge Line/Circuit (in)	⅞	1⅛	1⅛	1⅜	1⅜	1⅝	1⅝	1⅝	2⅛		
Refrigerant Liquid Line/Circuit (in)	⅝	⅞	⅞	1⅛	1⅛	1⅛	1⅛	1⅜	1⅝		
Length (in)	123	123	123	123	135	135	135	135	148		
Width (in)	66	66	67	68	71	99	99	98	101		
Height (in)	72	72	72	75	75	75	78	79	90		
Ship Weight (lbs)	3,335	3,634	3,624	3,814	4,224	5,040	5,628	6,478	7,499		
Operating Weight (lbs)	5,629	5,928	5,918	6,109	7,978	8,794	11,467	12,317	15,841		
Chiller with High Flow Reservoir Option											
Reservoir Capacity (gal)	400	400	400	400	650	650	1,000	1,000	1,000	The TSER200D and TSER240D are not available with an integral reservoir	
Process/Chiller Pump (hp)	10/1.5	10/2	15/2	15/3	20/3	25/3	30/5	40/7.5	40/10		
Process Connection Size (in)	2½	3	4	4	4	6	6	6	6		
Refrigerant Discharge Line/Circuit (in)	⅞	1⅛	1⅛	1⅜	1⅜	1⅝	1⅝	1⅝	2⅛		
Refrigerant Liquid Line/Circuit (in)	⅝	⅞	⅞	1⅛	1⅛	1⅛	1⅛	1⅜	1⅝		
Length (in)	123	123	123	123	135	135	135	135	148		
Width (in)	66	66	67	68	71	99	99	98	101		
Height (in)	72	72	72	75	75	75	78	79	90		
Ship Weight (lbs)	3,850	4,200	4,400	4,550	5,050	6,250	7,300	8,100	10,300		
Operating Weight (lbs)	7,200	7,550	7,750	7,900	10,500	11,700	15,650	16,450	18,650		

[1]Cooling capacity when cooling water with 50°F set point, 60°F return, 95°F condenser air, R410A refrigerant.

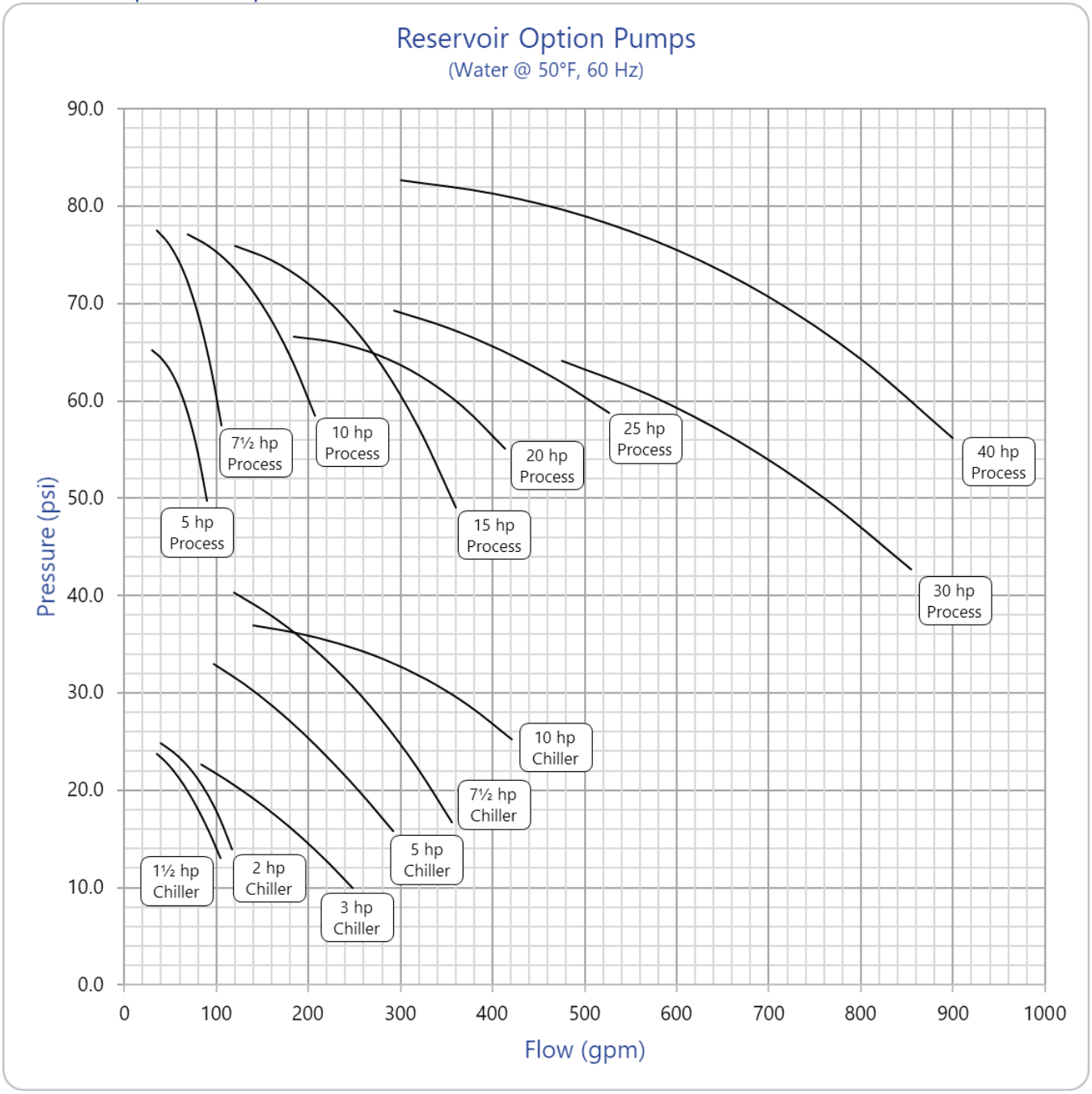
Remote Condensers (single-circuit)

Model	KCM014	KCL023	KCL030	KCL037	KCL045	KCL056	KCL068	KCL095	KCL110	S-GVW 090.1/4-N(2).M	S-GVW 090.1/5-N(2).M
Chiller Used With	TSER10S	TSER15S	TSER20S	TSER25S	TSER30S	TSER40S	TSER50S	TSER60S	TSER80S	TSER100S	TSER120S
Number of Fans	2	2	2	2	3	3	4	5	6	4	5
Refrigerant In (in)	1⅜	2⅛	2⅛	2⅛	2⅝	2⅝	2⅝	3⅛	3⅛	3⅛	3⅛
Refrigerant Out (in)	1⅛	1⅜	1⅝	1⅝	1⅝	2⅛	2⅛	2⅝	2⅝	3⅛	3⅛
Length (in)	83	113	113	113	168	168	223	278	333	223	271
Width (in)	43	45	45	45	45	45	45	45	45	51	51
Height (in)	48	54	54	54	54	54	54	54	54	69	69
Shipping Weight (lbs)	415	680	720	1,050	1,075	1,450	1,475	1,950	2,300	3,000	3,625
Operating Weight (lbs)	Varies based on system refrigerant charge and operating conditions										

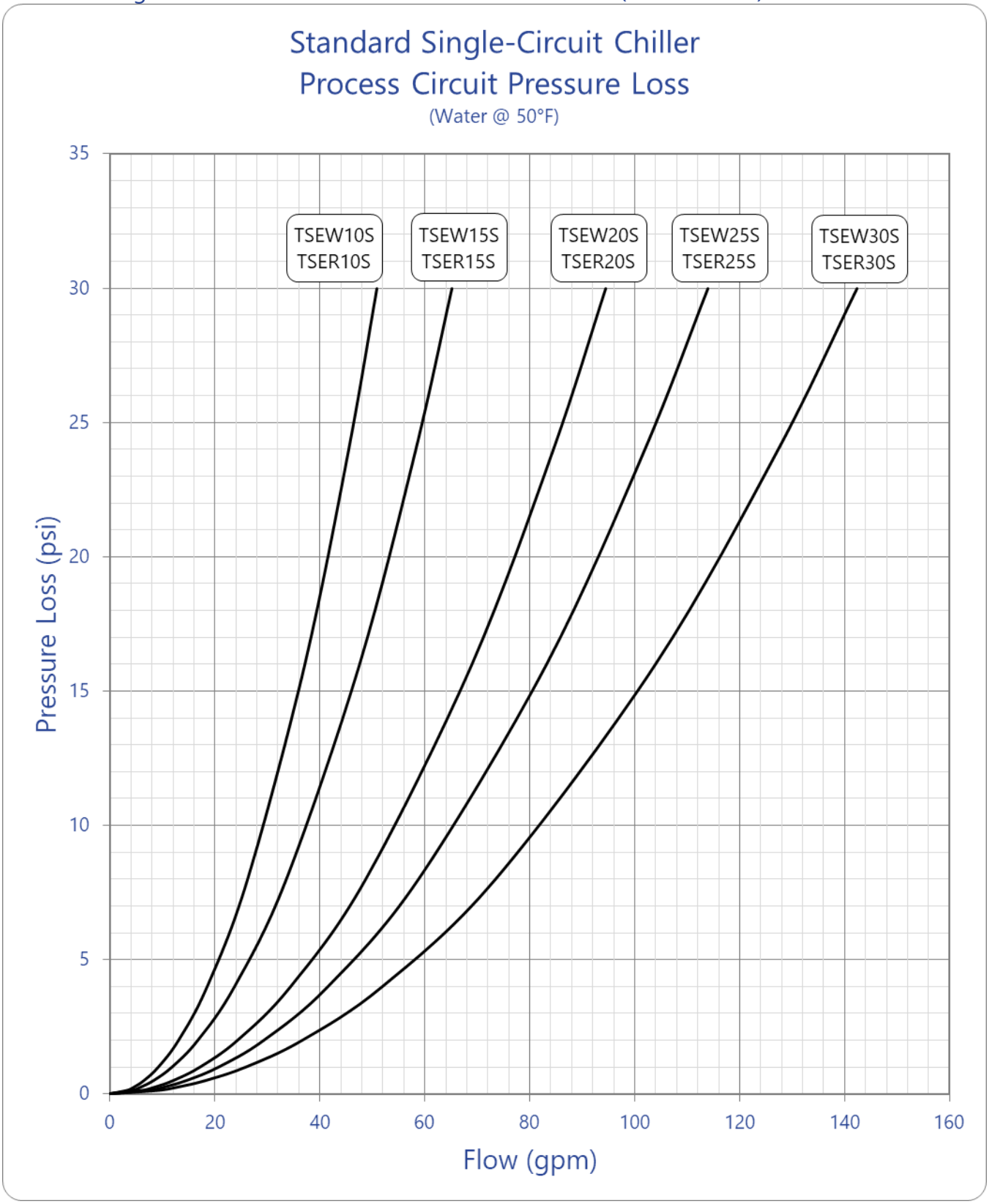
Remote Condensers (dual-circuit)

Model	KCM034	KCL047	KCL060	KCL074	KCL090	KCL112	KCL137	KCL190	KCL224	S-GVD 090.1D/2x4-M2.M	S-GVD 090.1D/2x5-M2.M
Chiller Used With	TSER20D	TSER30D	TSER40D	TSER50D	TSER60D	TSER80D	TSER100D	TSER120D	TSER160D	TSER200D	TSER240D
Number of Fans	4	4	4	4	6	6	8	10	12	8	10
Refrigerant In (in)	1⅝	2⅛	2⅛	2⅛	2⅛	2⅝	2⅝	3⅛	3⅛	3⅛ x 2	3⅝ x 2
Refrigerant Out (in)	1⅛	1⅜	1⅝	1⅝	1⅝	2⅛	2⅛	2⅝	2⅝	3⅛ x 2	3⅝ x 2
Length (in)	83	113	113	113	168	168	223	278	333	225	275
Width (in)	83	87	87	87	87	87	87	87	87	95	95
Height (in)	48	54	54	54	54	54	54	54	54	112	112
Shipping Weight (lbs)	830	1,175	1,525	1,525	2,000	2,275	2,800	3,700	4,400	7,800	10,025
Operating Weight (lbs)	Varies based on system refrigerant charge and operating conditions										

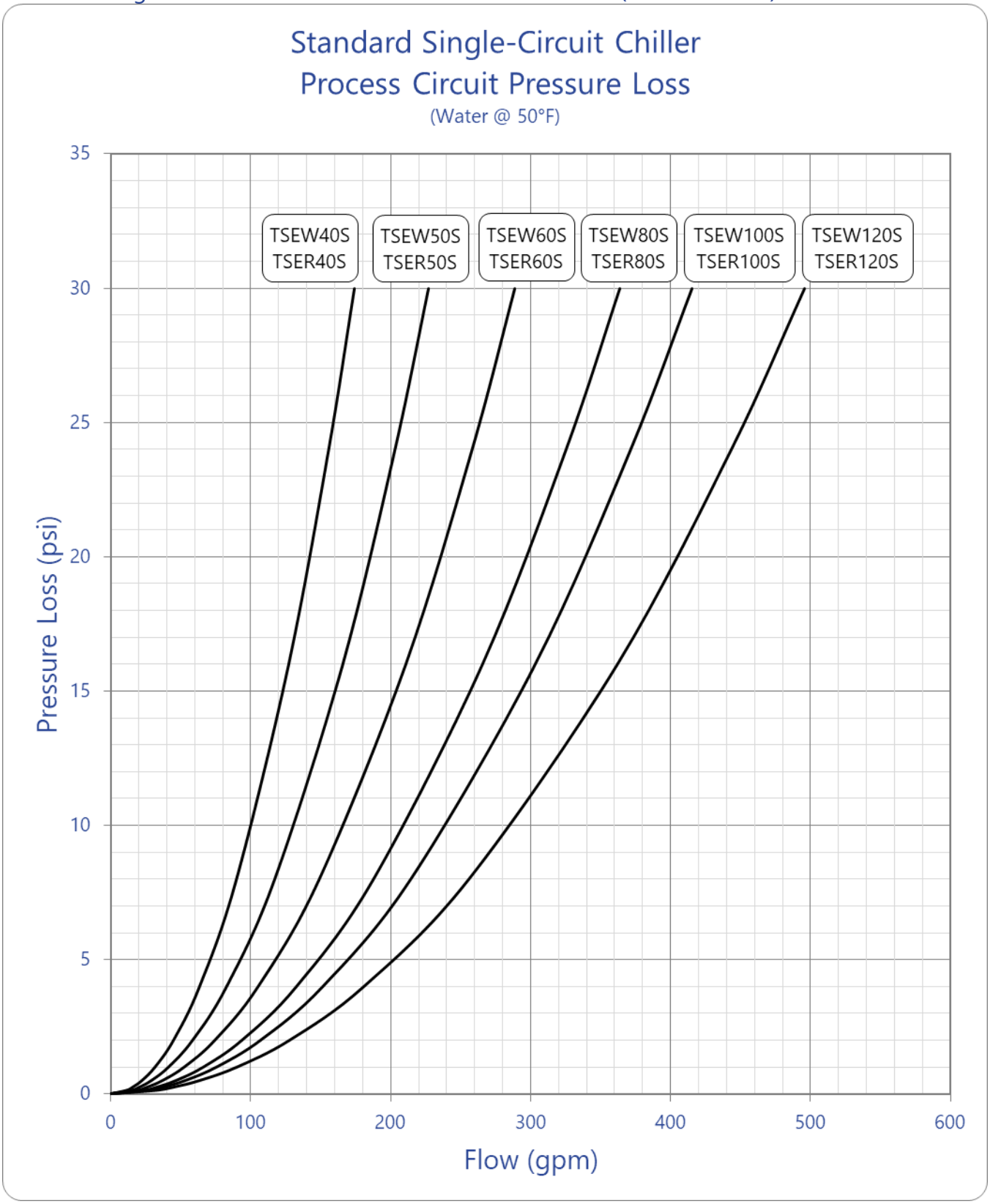
Reservoir Option Pump Performance



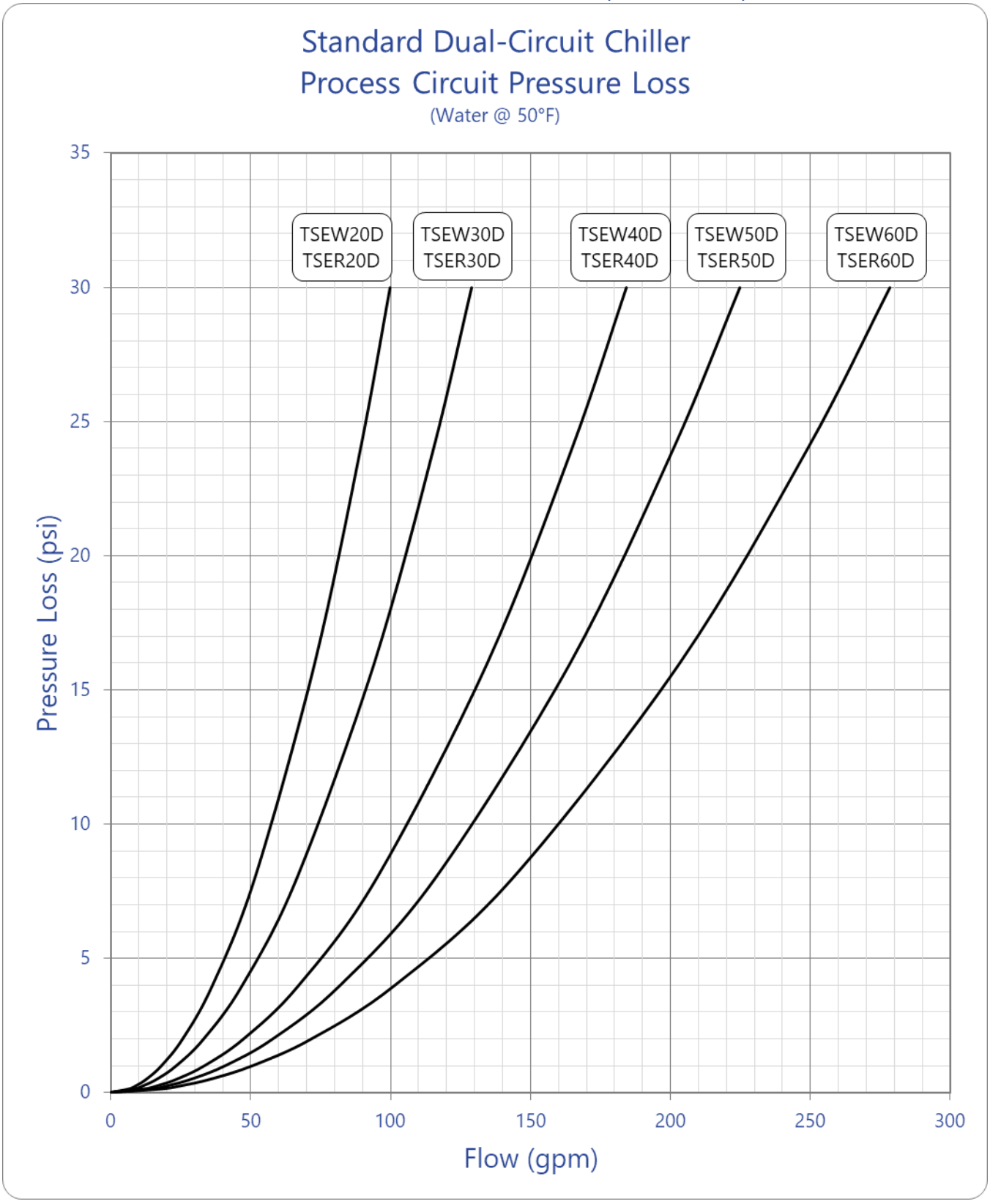
Standard Single-Circuit Chiller Process Circuit Pressure Loss (10 to 30 Ton)



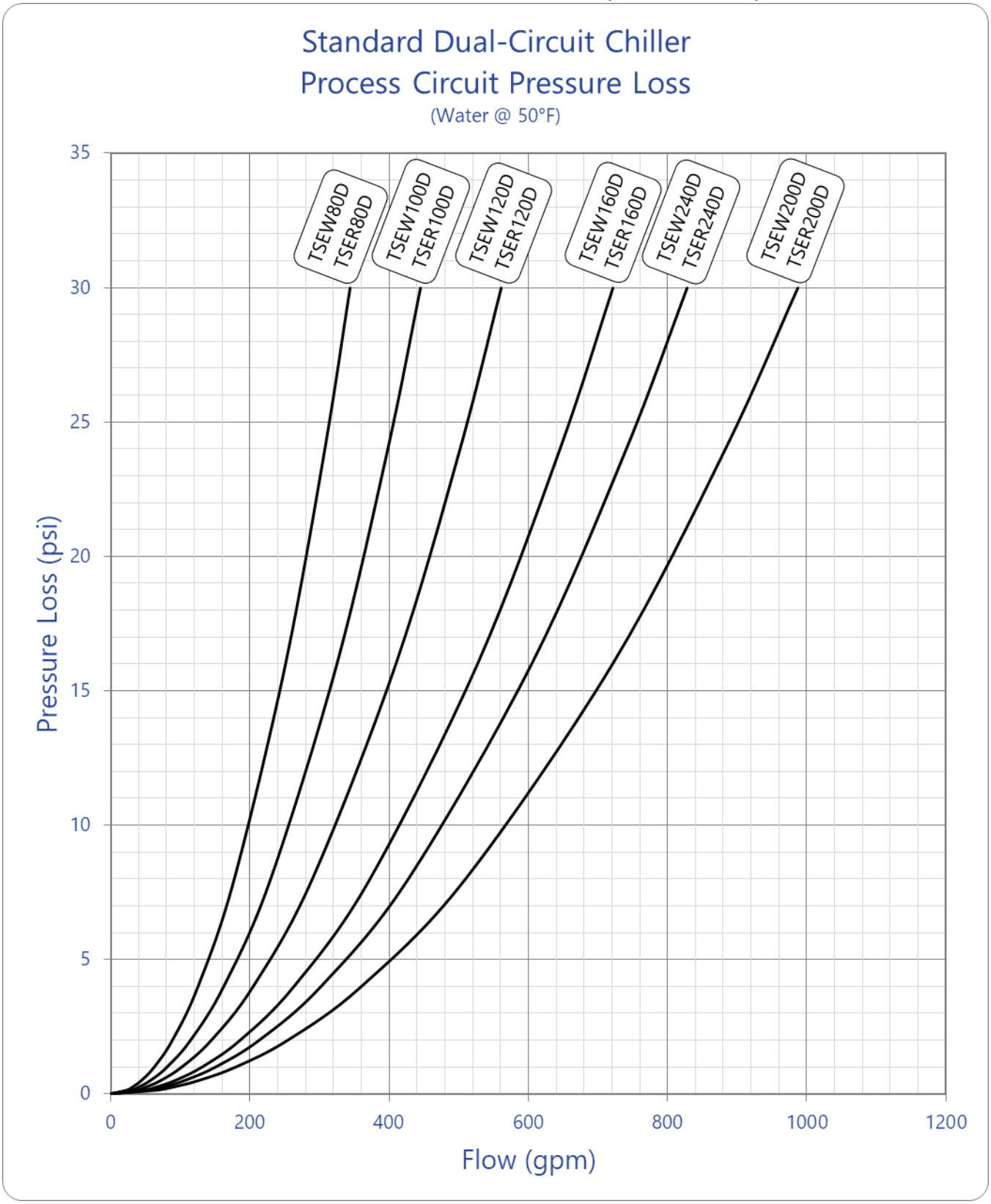
Standard Single-Circuit Chiller Process Circuit Pressure Loss (40 to 120 Ton)



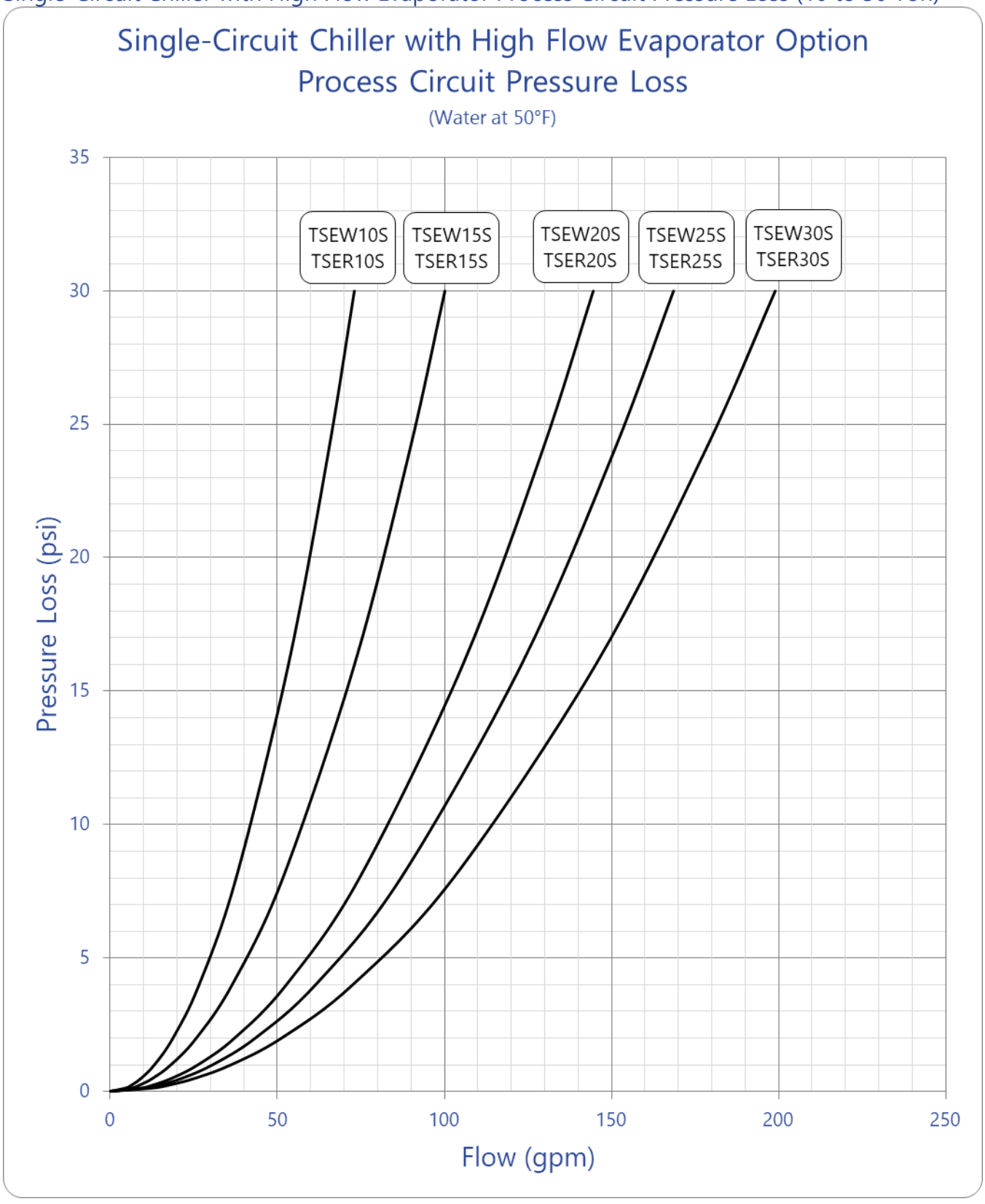
Standard Dual-Circuit Chiller Process Circuit Pressure Loss (20 to 60 Ton)



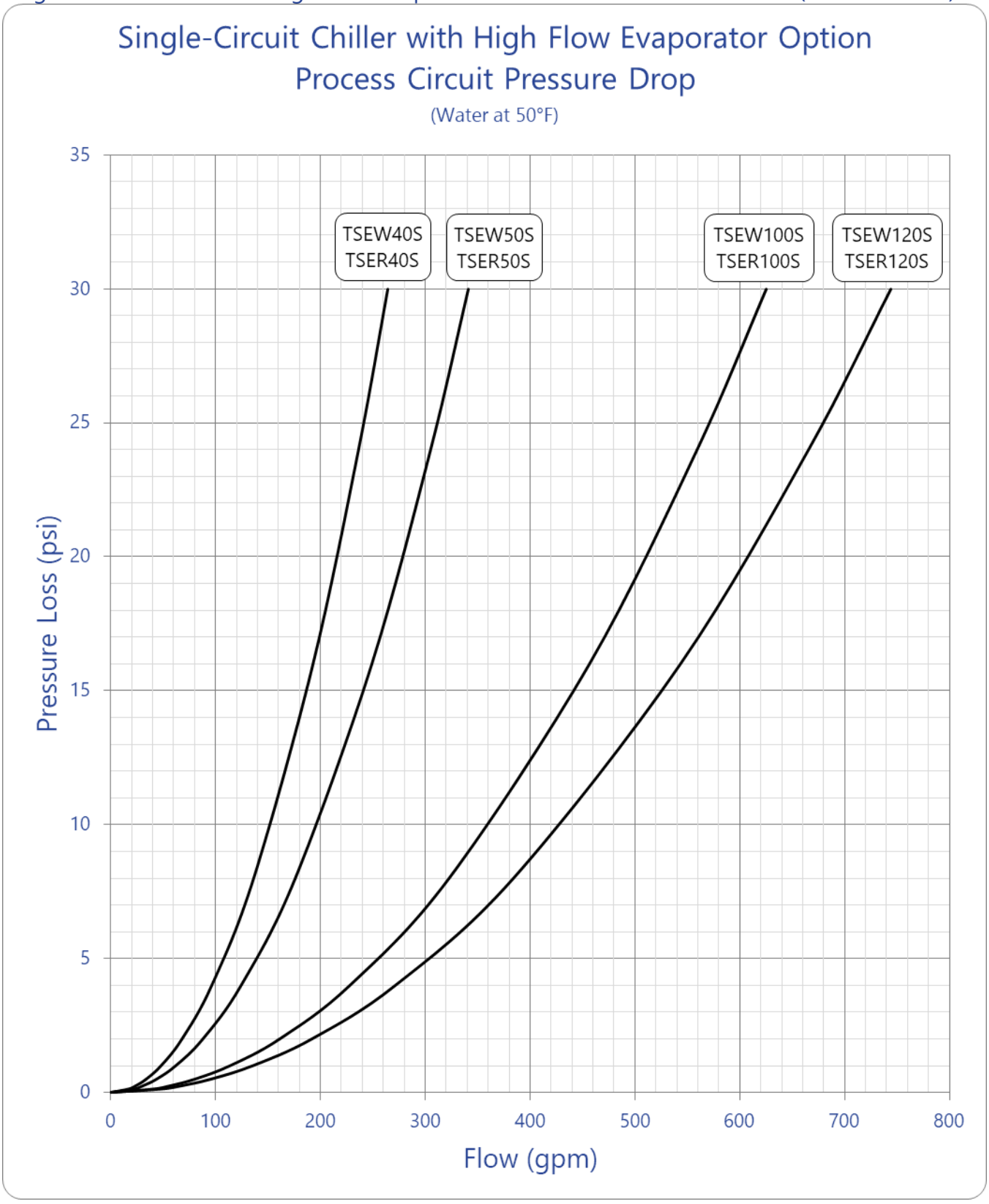
Standard Dual-Circuit Chiller Process Circuit Pressure Loss (80 to 240 Ton)



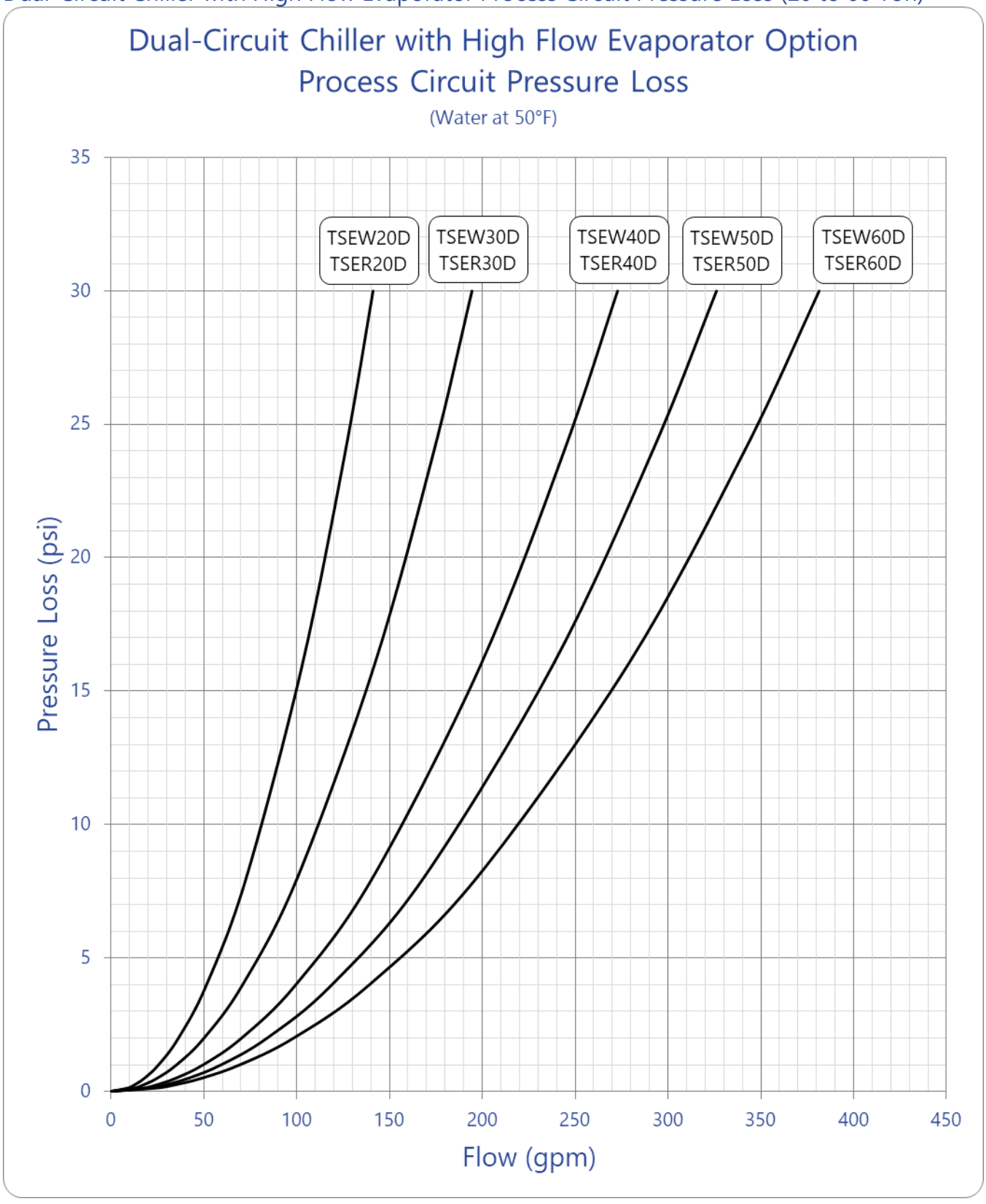
Single-Circuit Chiller with High Flow Evaporator Process Circuit Pressure Loss (10 to 30 Ton)



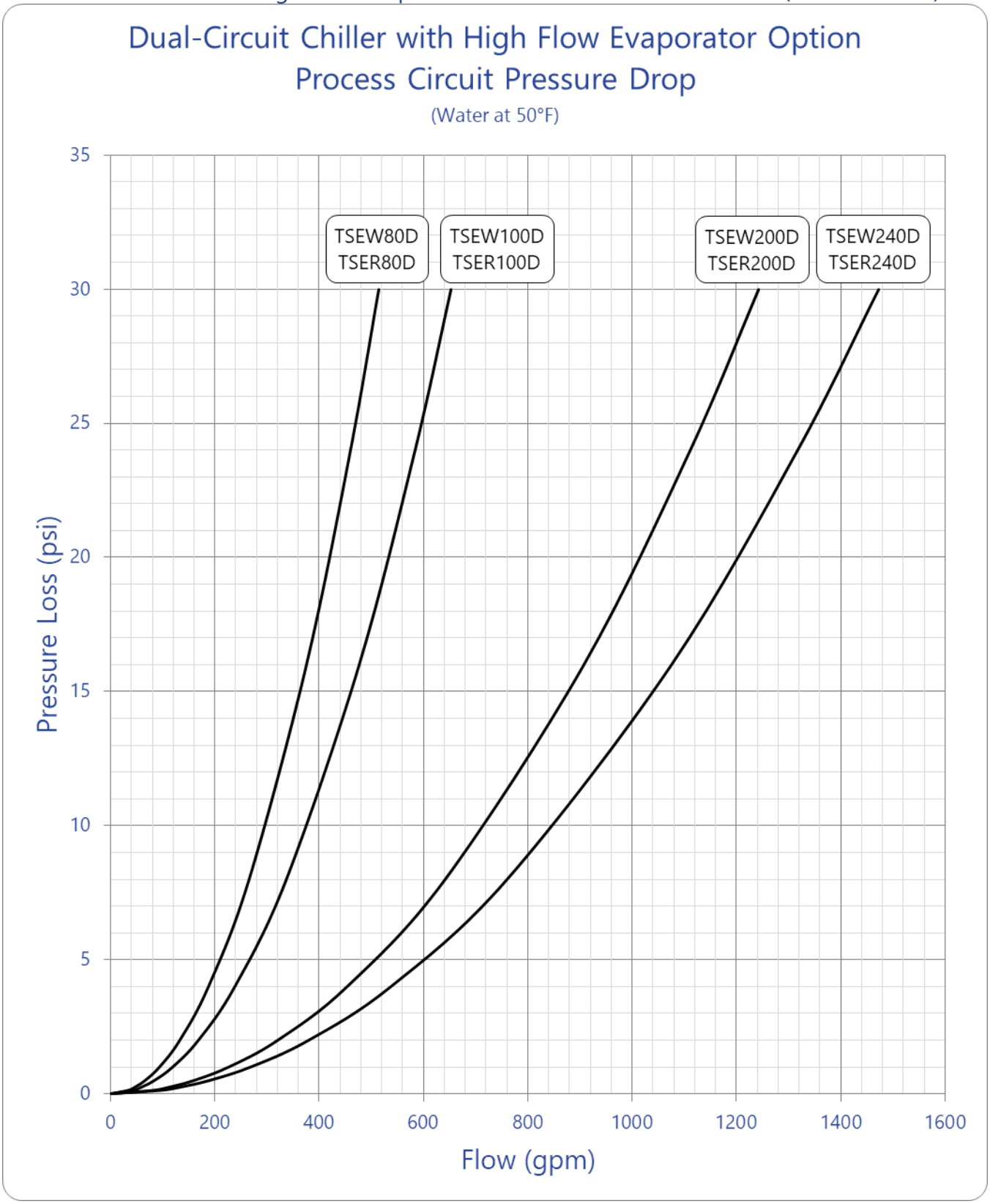
Single-Circuit Chiller with High Flow Evaporator Process Circuit Pressure Loss (40 to 120 Ton)



Dual-Circuit Chiller with High Flow Evaporator Process Circuit Pressure Loss (20 to 60 Ton)



Dual-Circuit Chiller with High Flow Evaporator Process Circuit Pressure Loss (80 to 240 Ton)



Electrical Data

Chiller Electrical Data (60 Hz)

Rated Voltage	Single-Circuit Chillers							Dual-Circuit Chillers						
	Model	Chiller		Chiller with Standard Flow Pumps		Chiller with High Flow Pumps		Model	Chiller		Chiller with Standard Flow Pumps		Chiller with High Flow Pumps	
		MCA[2]	MOP[3]	MCA[2]	MOP[3]	MCA[2]	MOP[3]		MCA[2]	MOP[3]	MCA[2]	MOP[3]	MCA[2]	MOP[3]
208	TSEW10S & TSER10S	44	60	67	80	68	80	TSEW20D & TSER20D	83	100	106	110	123	150
230		44	60	65	80	66	80		83	100	104	110	119	125
460		23	30	33	40	33	40		42	50	53	60	61	70
575		18	20	26	30	26	30		33	40	41	45	47	50
208	TSEW15S & TSER15S	68	90	88	110	99	125	TSEW30D & TSER30D	127	150	159	175	166	175
230		68	90	86	110	96	125		127	150	156	175	162	175
460		34	45	43	50	48	60		64	70	78	90	81	90
575		28	40	35	45	40	50		53	60	65	70	67	70
208	TSEW20S & TSER20S	77	100	96	125	114	125	TSEW40D & TSER40D	143	175	182	200	200	225
230		77	100	93	125	111	125		143	175	178	200	194	225
460		41	50	49	60	58	70		77	90	95	110	102	110
575		30	40	37	50	43	50		56	60	69	80	76	90
208	TSEW25S & TSER25S	117	150	132	175	155	200	TSEW50D & TSER50D	220	250	261	300	277	300
230		117	150	129	175	151	200		220	250	257	300	271	300
460		53	70	60	80	70	90		99	110	118	125	125	125
575		46	60	51	70	59	70		86	100	101	110	107	125
208	TSEW30S & TSER30S	127	175	151	200	166	200	TSEW60D & TSER60D	239	250	280	300	310	350
230		127	175	148	200	162	200		239	250	277	300	303	350
460		61	80	72	100	79	100		116	125	134	150	147	150
575		54	70	62	80	68	90		102	125	117	125	128	150
208	TSEW40S & TSER40S	165	225	192	250	218	250	TSEW80D & TSER80D	309	350	366	400	395	450
230		165	225	188	250	213	250		309	350	361	400	387	450
460		70	100	83	110	95	125		132	150	158	175	172	200
575		57	80	67	90	77	100		107	125	128	150	139	150
208	TSEW50S & TSER50S	194	250	221	300	250	300	TSEW100D & TSER100D	364	400	427	500	470	500
230		194	250	217	300	245	300		364	400	422	500	460	500
460		86	110	99	125	112	125		162	175	190	225	210	250
575		79	110	88	125	100	125		148	175	171	200	186	200
208	TSEW60S & TSER60S	248	350	270	350	318	400	TSEW120D & TSER120D	468	500	544	600	599	600
230		248	350	265	350	312	400		468	500	537	600	587	600
460		124	175	132	175	155	200		233	250	267	300	292	300
575		112	150	117	175	138	175		211	250	239	250	258	300
208	TSEW80S & TSER80S	n/a	n/a	n/a	n/a	n/a	n/a	TSEW160D & TSER160D	n/a	n/a	n/a	n/a	n/a	n/a
230		n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
460		165	225	178	250	204	250		311	350	359	400	377	450
575		118	150	130	175	149	200		222	250	260	300	274	300
208	TSEW100S & TSER100S	n/a	n/a	n/a	n/a	n/a	n/a	TSEW200D & TSER200D	n/a	n/a	n/a	n/a	n/a	n/a
230		n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
460		205	250	n/a	n/a	n/a	n/a		391	450	n/a	n/a	n/a	n/a
575		163	200	n/a	n/a	n/a	n/a		313	350	n/a	n/a	n/a	n/a
208	TSEW120S & TSER120S	n/a	n/a	n/a	n/a	n/a	n/a	TSEW240D & TSER240D	n/a	n/a	n/a	n/a	n/a	n/a
230		n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
460		238	300	n/a	n/a	n/a	n/a		457	500	n/a	n/a	n/a	n/a
575		166	200	n/a	n/a	n/a	n/a		318	350	n/a	n/a	n/a	n/a

[1]Allowable voltage is ± 10% from rated voltage.

[2]MCA is Minimum Circuit Amps, used for minimum wire size requirement.

[3]MOP is Maximum Overcurrent Protection, used for sizing main power protection device.

Remote Condenser Electrical Data

Rated Voltage	Single-Circuit Remote Condensers			Dual-Circuit Remote Condensers		
	Model	MCA[2]	MOP[3]	Model	MCA[2]	MOP[3]
208	KCM014	5.2	15	KCM034	9.8	15
230		5.2	15		9.8	15
460		2.6	15		4.9	15
575		2	15		3.8	15
208	KCL023	16	20	KCL047	31	35
230		16	20		31	35
460		7	15		16	20
575		5.6	15		10.6	15
208	KCL030	16	20	KCL060	31	35
230		16	20		31	35
460		7	15		16	20
575		5.6	15		10.6	15
208	KCL037	16	20	KCL074	31	35
230		16	20		31	35
460		7	15		16	20
575		5.6	15		10.6	15
208	KCL045	21.5	25	KCL090	46	50
230		21.5	25		46	50
460		10.1	15		21	25
575		8.1	15		16	20
208	KCL056	21.5	25	KCL112	46	50
230		21.5	25		46	50
460		10.1	15		21	25
575		8.1	15		16	20
208	KCL068	31	35	KCL137	61	70
230		31	35		61	70
460		16	20		31	35
575		10.6	15		21	25
208	KCL095	41	45	KCL190	81	90
230		41	45		81	90
460		16	20		36	40
575		16	20		31	35
208	KCL110	46	50	KCL224	91	100
230		46	50		91	100
460		21	25		46	50
575		16	20		36	40
208	S-GVW 090.1/4-N(2).M	-	-	S-GVD 090.1D/2x4-M2.M	-	-
230		-	-		-	-
460		24.2	25		31	35
575		-	-		-	-
208	S-GVW 090.1/5-N(2).M	-	-	S-GVD 090.1D/2x5-M2.M	-	-
230		-	-		-	-
460		30	35		38	40
575		-	-		-	-

[1]Allowable voltage is ± 10% from rated voltage.
[2]MCA is Minimum Circuit Amps as provided by the remote condenser manufacturer, used for minimum wire size requirement.
[3]MOP is Maximum Overcurrent Protection as provided by the remote condenser manufacturer, used for sizing main power protection device.

Performance Data

TSEW Series Water Cooled Condenser Chiller Cooling Capacities - 60 Hz

Leaving Coolant Temp	Model	Entering Condenser Water Temperature											
		80°F			85°F			90°F			95°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
20°F	TSEW10S	5.7	8.8	16.0	5.7	8.8	16.0	5.5	9.2	15.5	5.3	9.9	14.7
	TSEW15S	8.8	12.3	24.6	8.8	12.3	24.6	8.7	12.8	24.1	8.4	13.6	23.3
	TSEW20S	11.9	16.0	33.3	11.9	16.0	33.3	11.7	16.7	32.5	11.1	17.9	31.1
	TSEW25S	15.1	20.3	42.1	15.1	20.3	42.1	14.8	20.9	41.4	14.3	22.2	40.0
	TSEW30S	17.9	23.8	49.8	17.9	23.8	49.8	17.6	24.4	49.0	17.0	26.0	47.4
	TSEW40S	23.3	31.8	65.0	23.3	31.8	65.0	22.9	32.7	64.0	22.2	34.7	61.9
	TSEW50S	28.9	39.7	80.8	28.9	39.7	80.7	28.5	41.1	79.4	27.4	43.6	76.6
	TSEW60S	37.6	50.6	104.8	37.6	50.6	104.8	36.9	52.4	102.8	35.6	55.6	99.2
	TSEW80S	47.1	63.1	131.3	47.1	63.1	131.3	46.3	64.7	129.1	44.6	68.3	124.5
	TSEW100S	60.8	82.3	169.6	60.8	82.3	169.5	60.0	84.0	167.5	58.0	88.8	161.9
	TSEW120S	70.9	96.0	197.7	70.9	96.0	197.7	70.3	97.2	196.1	68.0	102.6	189.8
	TSEW20D	11.5	18.0	32.0	11.5	18.0	32.0	11.1	18.8	30.9	10.5	19.9	29.4
	TSEW30D	17.6	24.8	49.1	17.6	24.8	49.1	17.3	25.6	48.3	16.7	27.2	46.7
	TSEW40D	23.9	32.4	66.6	23.9	32.4	66.6	23.3	33.5	65.1	22.3	36.2	62.2
	TSEW50D	30.2	40.8	84.2	30.2	40.8	84.2	29.6	42.0	82.7	28.7	44.8	80.0
	TSEW60D	35.7	47.6	99.7	35.7	47.6	99.7	35.2	49.1	98.1	34.0	52.1	94.7
	TSEW80D	46.6	63.8	129.9	46.6	63.8	129.9	45.9	65.7	128.0	44.4	69.6	123.8
	TSEW100D	57.9	79.7	161.5	57.9	79.7	161.5	56.9	82.1	158.8	54.9	87.7	153.1
	TSEW120D	75.1	101.2	209.6	75.1	101.2	209.6	73.7	104.7	205.6	71.1	111.2	198.4
	TSEW160D	94.1	126.3	262.6	94.1	126.3	262.5	92.6	129.6	258.2	89.3	136.9	249.1
	TSEW200D	121.6	164.8	339.1	121.6	164.8	339.1	120.1	168.2	335.0	116.1	177.9	323.8
	TSEW240D	141.7	192.0	395.4	141.7	192.0	395.4	140.6	194.7	392.3	136.0	205.4	379.5
25°F	TSEW10S	6.5	8.9	17.5	6.5	8.9	17.5	6.3	9.3	17.0	6.0	9.9	16.2
	TSEW15S	9.8	12.4	26.5	9.8	12.4	26.5	9.6	12.8	26.0	9.3	13.6	25.2
	TSEW20S	13.4	16.1	36.2	13.4	16.1	36.2	13.1	16.8	35.4	12.5	17.9	33.9
	TSEW25S	16.8	20.5	45.4	16.8	20.5	45.4	16.5	21.2	44.6	15.9	22.4	43.1
	TSEW30S	19.9	23.9	53.9	19.9	23.9	53.9	19.6	24.7	53.0	18.9	26.1	51.2
	TSEW40S	25.9	32.0	70.1	25.9	32.0	70.1	25.4	32.9	69.0	24.6	34.9	66.8
	TSEW50S	32.3	39.8	87.6	32.3	39.8	87.5	31.7	41.1	86.0	30.6	43.7	83.1
	TSEW60S	41.9	50.9	113.6	41.9	50.9	113.5	41.0	52.7	111.3	39.7	56.0	107.5
	TSEW80S	52.3	64.0	141.7	52.3	64.0	141.7	51.3	65.8	139.1	49.5	69.4	134.3
	TSEW100S	67.5	82.9	183.1	67.5	82.9	183.1	66.6	84.9	180.6	64.4	89.6	174.7
	TSEW120S	78.7	96.8	213.3	78.7	96.8	213.3	77.9	98.3	211.4	75.5	103.8	204.6
	TSEW20D	12.9	17.8	35.1	12.9	17.8	35.1	12.5	18.6	34.0	12.0	19.9	32.4
	TSEW30D	19.6	24.9	53.0	19.6	24.9	53.0	19.2	25.7	52.1	18.6	27.4	50.4
	TSEW40D	26.7	32.3	72.5	26.7	32.3	72.5	26.1	33.5	70.8	25.0	36.0	67.8
	TSEW50D	33.5	41.0	90.9	33.5	41.0	90.9	32.9	42.5	89.2	31.8	45.0	86.3
	TSEW60D	39.8	47.9	107.9	39.8	47.9	107.8	39.1	49.4	106.0	37.8	52.4	102.4
	TSEW80D	51.7	63.9	140.3	51.7	63.9	140.2	50.9	66.0	138.0	49.3	70.1	133.6
	TSEW100D	64.6	79.7	175.1	64.6	79.7	175.1	63.5	82.5	172.1	61.3	87.8	166.2
	TSEW120D	83.8	101.9	227.1	83.7	101.8	227.1	82.1	105.6	222.6	79.3	112.0	215.1
	TSEW160D	104.5	128.1	283.4	104.5	128.1	283.4	102.6	131.8	278.3	99.1	139.1	268.6
	TSEW200D	135.0	166.0	366.2	135.0	166.0	366.1	133.2	169.9	361.2	128.8	179.4	349.4
	TSEW240D	157.4	193.7	426.7	157.4	193.7	426.7	155.9	196.8	422.7	150.9	207.7	409.2

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R410A refrigerant.
[2]kW = Total compressor input power at rated voltage.

TSEW Series Water Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Water Temperature											
		80°F			85°F			90°F			95°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
30°F	TSEW10S	7.2	8.7	19.1	7.2	8.7	19.1	7.0	9.2	18.5	6.7	9.7	17.8
	TSEW15S	10.8	12.4	28.6	10.8	12.4	28.6	10.6	12.8	28.0	10.3	13.7	27.2
	TSEW20S	14.9	16.1	39.3	14.9	16.1	39.3	14.6	16.8	38.4	14.0	18.0	36.9
	TSEW25S	18.6	20.6	49.0	18.5	20.5	49.0	18.2	21.4	48.0	17.6	22.6	46.5
	TSEW30S	22.1	24.1	58.2	22.1	24.1	58.2	21.7	24.9	57.2	20.9	26.2	55.3
	TSEW40S	28.6	32.0	75.6	28.6	32.0	75.6	28.1	33.1	74.3	27.3	35.2	72.0
	TSEW50S	35.9	39.9	94.7	35.9	39.9	94.7	35.2	41.3	93.0	34.1	44.0	89.9
	TSEW60S	46.5	51.2	122.8	46.5	51.2	122.8	45.5	53.2	120.2	44.0	56.3	116.2
	TSEW80S	57.9	64.8	152.9	57.9	64.8	152.8	56.8	66.9	149.8	54.8	70.4	144.7
	TSEW100S	74.8	83.6	197.4	74.8	83.6	197.4	73.7	85.8	194.5	71.3	90.6	188.2
	TSEW120S	87.1	97.5	230.0	87.1	97.5	230.0	86.2	99.4	227.5	83.5	104.9	220.3
	TSEW20D	14.5	17.8	38.2	14.5	17.8	38.2	14.0	18.5	37.1	13.5	19.8	35.5
	TSEW30D	21.7	25.0	57.2	21.7	25.0	57.2	21.2	25.8	56.1	20.6	27.5	54.3
	TSEW40D	29.8	32.4	78.7	29.8	32.4	78.6	29.1	33.7	76.8	27.9	36.0	73.8
	TSEW50D	37.1	41.2	97.9	37.1	41.2	97.9	36.4	42.9	96.0	35.2	45.4	93.0
	TSEW60D	44.1	48.1	116.5	44.1	48.1	116.5	43.3	49.8	114.4	41.9	52.8	110.6
	TSEW80D	57.3	64.2	151.2	57.3	64.2	151.1	56.3	66.5	148.5	54.5	70.4	144.0
	TSEW100D	71.8	79.9	189.4	71.8	79.9	189.4	70.5	82.8	186.0	68.1	88.0	179.8
	TSEW120D	93.0	102.5	245.5	93.0	102.5	245.5	91.1	106.6	240.3	88.1	113.0	232.5
	TSEW160D	115.8	129.6	305.7	115.8	129.6	305.7	113.5	133.8	299.7	109.7	141.1	289.5
	TSEW200D	149.6	167.3	394.9	149.6	167.3	394.9	147.4	171.8	389.0	142.6	181.4	376.4
	TSEW240D	174.3	195.2	460.0	174.3	195.2	460.0	172.4	199.0	455.0	166.9	209.9	440.6
35°F	TSEW10S	8.1	8.8	20.7	8.1	8.8	20.7	7.8	9.1	20.1	7.5	9.7	19.3
	TSEW15S	12.0	12.5	30.8	12.0	12.5	30.8	11.7	12.9	30.2	11.4	13.8	29.2
	TSEW20S	16.5	16.1	42.5	16.5	16.1	42.5	16.1	16.8	41.5	15.5	17.9	40.0
	TSEW25S	20.5	20.7	52.7	20.5	20.7	52.7	20.0	21.5	51.6	19.4	22.8	50.0
	TSEW30S	24.4	24.2	62.8	24.4	24.2	62.8	23.9	25.0	61.5	23.2	26.6	59.6
	TSEW40S	31.6	32.1	81.3	31.6	32.1	81.3	31.0	33.3	79.8	30.1	35.4	77.4
	TSEW50S	39.7	39.9	102.2	39.7	39.9	102.2	39.0	41.6	100.3	37.7	44.1	97.1
	TSEW60S	51.5	51.6	132.4	51.5	51.6	132.4	50.3	53.7	129.4	48.7	56.9	125.3
	TSEW80S	64.1	65.5	164.8	64.1	65.5	164.8	62.7	67.8	161.2	60.6	71.4	155.9
	TSEW100S	82.7	84.2	212.7	82.7	84.2	212.7	81.3	86.7	209.1	78.7	91.6	202.4
	TSEW120S	96.3	98.2	247.7	96.3	98.2	247.7	95.1	100.5	244.6	92.1	106.0	236.9
	TSEW20D	16.1	17.5	41.5	16.1	17.5	41.5	15.6	18.4	40.3	15.0	19.5	38.7
	TSEW30D	23.9	24.9	61.6	23.9	24.9	61.6	23.4	26.0	60.3	22.7	27.6	58.4
	TSEW40D	33.1	32.5	85.1	33.1	32.5	85.1	32.3	33.8	83.1	31.1	36.2	79.9
	TSEW50D	41.0	41.5	105.4	41.0	41.5	105.4	40.1	43.3	103.2	38.9	45.9	100.0
	TSEW60D	48.8	48.5	125.5	48.8	48.5	125.5	47.8	50.2	123.1	46.3	53.2	119.1
	TSEW80D	63.2	64.4	162.7	63.2	64.4	162.7	62.0	66.8	159.6	60.2	70.9	154.8
	TSEW100D	79.5	80.1	204.5	79.5	80.1	204.5	77.9	83.1	200.5	75.5	88.4	194.1
	TSEW120D	102.9	103.1	264.9	102.9	103.1	264.9	100.6	107.6	258.9	97.4	114.0	250.6
	TSEW160D	128.1	131.1	329.6	128.1	131.1	329.6	125.3	135.6	322.5	121.2	143.0	311.7
	TSEW200D	165.3	168.5	425.3	165.3	168.5	425.3	162.6	173.6	418.2	157.4	183.3	404.9
	TSEW240D	192.5	196.5	495.3	192.5	196.5	495.3	190.1	200.9	489.1	184.2	212.2	473.8

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R410A refrigerant.
[2]kW = Total compressor input power at rated voltage.

TSEW Series Water Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Water Temperature											
		80°F			85°F			90°F			95°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
40°F	TSEW10S	8.9	8.6	22.4	8.9	8.6	22.4	8.7	9.1	21.8	8.4	9.7	21.0
	TSEW15S	13.2	12.5	33.1	13.2	12.5	33.1	12.9	13.0	32.4	12.5	13.8	31.4
	TSEW20S	18.3	16.2	45.9	18.3	16.2	45.9	17.8	16.9	44.8	17.2	18.1	43.2
	TSEW25S	22.6	20.9	56.6	22.6	20.9	56.6	22.0	21.7	55.4	21.4	23.1	53.7
	TSEW30S	26.9	24.4	67.5	26.9	24.4	67.5	26.3	25.3	66.1	25.5	26.8	64.0
	TSEW40S	34.8	32.3	87.4	34.8	32.3	87.4	34.1	33.6	85.7	33.1	35.6	83.1
	TSEW50S	43.9	40.2	110.1	43.9	40.2	110.1	43.0	41.9	107.9	41.6	44.3	104.5
	TSEW60S	56.8	52.0	142.6	56.8	52.0	142.6	55.4	54.3	139.1	53.7	57.5	134.8
	TSEW80S	70.7	66.1	177.6	70.7	66.1	177.6	69.1	68.7	173.4	66.8	72.3	167.7
	TSEW100S	91.1	84.7	228.8	91.1	84.7	228.8	89.4	87.6	224.6	86.6	92.5	217.5
	TSEW120S	106.1	98.7	266.4	106.1	98.7	266.4	104.6	101.3	262.6	101.3	107.0	254.5
	TSEW20D	17.9	17.5	44.9	17.9	17.5	44.9	17.3	18.3	43.5	16.7	19.4	42.0
	TSEW30D	26.4	25.1	66.3	26.4	25.1	66.3	25.8	26.2	64.8	25.0	27.7	62.8
	TSEW40D	36.5	32.5	91.8	36.5	32.5	91.8	35.6	33.9	89.5	34.4	36.3	86.3
	TSEW50D	45.1	41.8	113.3	45.1	41.8	113.3	44.1	43.7	110.7	42.7	46.2	107.3
	TSEW60D	53.8	48.8	135.1	53.8	48.8	135.0	52.6	50.7	132.2	51.0	53.7	128.1
	TSEW80D	69.6	64.6	174.9	69.6	64.6	174.8	68.2	67.3	171.3	66.2	71.3	166.3
	TSEW100D	87.7	80.4	220.3	87.7	80.4	220.3	85.9	83.7	215.7	83.3	88.9	209.1
	TSEW120D	113.6	104.0	285.2	113.6	104.0	285.2	110.8	108.8	278.3	107.3	115.1	269.6
	TSEW160D	141.4	132.4	355.2	141.4	132.4	355.1	138.1	137.4	346.8	133.6	144.7	335.5
	TSEW200D	182.2	169.5	457.6	182.2	169.5	457.6	178.9	175.3	449.1	173.2	185.1	435.0
	TSEW240D	212.2	197.5	532.8	212.2	197.5	532.8	209.2	202.8	525.2	202.7	214.2	508.9
45°F	TSEW10S	9.9	8.6	23.7	9.9	8.6	23.7	9.6	9.1	23.0	9.3	9.6	22.2
	TSEW15S	14.6	12.6	34.9	14.6	12.6	34.9	14.2	13.1	34.1	13.8	13.9	33.0
	TSEW20S	20.1	16.2	48.3	20.1	16.2	48.3	19.6	17.0	47.1	19.0	18.2	45.5
	TSEW25S	24.8	20.9	59.6	24.8	20.9	59.6	24.2	22.0	58.1	23.5	23.3	56.4
	TSEW30S	29.6	24.6	71.0	29.6	24.6	71.0	28.9	25.6	69.4	28.0	27.0	67.3
	TSEW40S	38.3	32.4	91.9	38.3	32.4	91.9	37.5	33.9	89.9	36.4	35.9	87.3
	TSEW50S	48.3	40.4	116.0	48.3	40.4	115.9	47.3	42.3	113.4	45.9	44.7	110.0
	TSEW60S	62.6	52.5	150.1	62.6	52.5	150.1	60.9	55.0	146.1	59.0	58.1	141.6
	TSEW80S	78.1	66.8	187.3	78.1	66.8	187.3	76.1	69.5	182.5	73.6	73.1	176.6
	TSEW100S	100.4	85.1	240.7	100.3	85.0	240.7	98.3	88.4	235.8	95.2	93.4	228.5
	TSEW120S	116.8	98.9	280.3	116.8	98.9	280.3	115.0	102.1	275.8	111.4	107.9	267.3
	TSEW20D	19.8	17.3	47.4	19.8	17.3	47.4	19.2	18.2	46.0	18.5	19.3	44.4
	TSEW30D	29.1	25.1	69.8	29.1	25.1	69.8	28.4	26.3	68.1	27.5	27.9	66.1
	TSEW40D	40.3	32.6	96.7	40.3	32.6	96.7	39.3	34.2	94.2	38.0	36.5	91.1
	TSEW50D	49.7	42.1	119.2	49.7	42.1	119.2	48.5	44.2	116.2	47.0	46.7	112.7
	TSEW60D	59.2	49.3	142.0	59.2	49.3	142.0	57.9	51.4	138.8	56.1	54.3	134.6
	TSEW80D	76.6	64.9	183.9	76.6	64.9	183.8	75.0	67.9	179.8	72.8	71.8	174.6
	TSEW100D	96.7	81.0	231.9	96.7	81.0	231.9	94.5	84.5	226.8	91.7	89.5	220.0
	TSEW120D	125.1	105.0	300.1	125.1	105.0	300.1	121.8	110.1	292.3	118.1	116.5	283.2
	TSEW160D	156.1	133.7	374.5	156.1	133.7	374.5	152.1	139.1	364.9	147.2	146.2	353.2
	TSEW200D	200.7	170.2	481.5	200.7	170.2	481.5	196.6	176.8	471.7	190.5	187.0	456.9
	TSEW240D	233.7	198.0	560.6	233.7	198.0	560.6	229.9	204.2	551.6	222.9	216.1	534.6

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R410A refrigerant.
[2]kW = Total compressor input power at rated voltage.

TSEW Series Water Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Water Temperature											
		80°F			85°F			90°F			95°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
50°F	TSEW10S	10.9	8.5	26.1	10.9	8.5	26.1	10.5	9.0	25.3	10.2	9.5	24.5
	TSEW15S	16.0	12.6	38.3	16.0	12.6	38.3	15.5	13.2	37.3	15.1	14.0	36.2
	TSEW20S	22.1	16.4	52.9	22.1	16.4	52.9	21.5	17.2	51.6	20.8	18.3	49.9
	TSEW25S	27.2	21.1	65.3	27.2	21.1	65.3	26.5	22.3	63.6	25.7	23.6	61.6
	TSEW30S	32.4	24.9	77.7	32.4	24.9	77.7	31.6	26.0	75.8	30.6	27.4	73.6
	TSEW40S	41.9	32.6	100.7	41.9	32.6	100.7	41.0	34.2	98.3	39.8	36.2	95.5
	TSEW50S	52.9	40.8	127.0	52.9	40.8	127.0	51.7	42.7	124.0	50.2	45.2	120.4
	TSEW60S	68.5	53.0	164.4	68.5	53.0	164.4	66.6	55.8	159.7	64.5	58.8	154.9
	TSEW80S	85.7	67.4	205.7	85.7	67.4	205.7	83.4	70.3	200.1	80.7	73.8	193.7
	TSEW100S	110.0	85.3	263.9	110.0	85.3	263.9	107.5	89.0	258.0	104.2	94.2	250.0
	TSEW120S	128.0	98.9	307.2	128.0	98.9	307.2	125.7	102.6	301.7	121.9	108.7	292.6
	TSEW20D	21.7	17.0	52.1	21.7	17.1	52.1	21.1	18.1	50.6	20.4	19.2	48.9
	TSEW30D	31.9	25.2	76.6	31.9	25.2	76.6	31.1	26.5	74.6	30.2	28.1	72.4
	TSEW40D	44.1	32.7	105.9	44.1	32.7	105.9	43.0	34.5	103.1	41.6	36.6	99.8
	TSEW50D	54.4	42.4	130.6	54.4	42.4	130.6	53.0	44.6	127.1	51.4	47.2	123.3
	TSEW60D	64.8	49.9	155.4	64.8	49.9	155.4	63.2	52.1	151.6	61.3	54.9	147.1
	TSEW80D	83.9	65.4	201.3	83.9	65.4	201.3	81.9	68.5	196.6	79.6	72.4	191.0
	TSEW100D	105.8	81.7	254.0	105.8	81.7	254.0	103.3	85.5	248.0	100.3	90.3	240.8
	TSEW120D	137.0	106.1	328.7	137.0	106.1	328.8	133.1	111.6	319.5	129.1	117.9	309.7
	TSEW160D	171.4	134.8	411.4	171.4	134.8	411.5	166.7	140.7	400.1	161.4	147.7	387.5
	TSEW200D	219.9	170.6	527.8	219.9	170.6	527.8	215.0	178.1	516.0	208.4	188.6	500.1
	TSEW240D	256.0	198.0	614.5	256.0	198.0	614.5	251.4	205.2	603.5	243.8	217.5	585.1
55°F	TSEW10S	11.9	8.4	28.6	11.9	8.4	28.5	11.5	8.9	27.7	11.2	9.5	26.8
	TSEW15S	17.5	12.6	42.0	17.5	12.6	42.0	17.0	13.3	40.8	16.5	14.1	39.6
	TSEW20S	24.1	16.4	57.8	24.1	16.4	57.8	23.4	17.3	56.2	22.7	18.4	54.5
	TSEW25S	29.8	21.4	71.5	29.8	21.4	71.4	28.9	22.5	69.4	28.0	23.8	67.3
	TSEW30S	35.3	25.2	84.8	35.3	25.2	84.8	34.4	26.4	82.6	33.4	27.8	80.2
	TSEW40S	45.8	32.9	110.0	45.8	32.9	110.0	44.7	34.6	107.2	43.4	36.5	104.2
	TSEW50S	57.8	41.3	138.7	57.8	41.3	138.7	56.3	43.3	135.2	54.7	45.7	131.4
	TSEW60S	74.8	53.6	179.6	74.7	53.8	179.3	72.5	56.6	174.1	70.3	59.7	168.8
	TSEW80S	94.0	68.0	225.6	94.0	68.0	225.6	91.2	71.1	218.9	88.3	74.5	212.1
	TSEW100S	120.2	85.1	288.6	120.2	85.1	288.6	117.3	89.5	281.7	113.7	94.8	273.0
	TSEW120S	140.0	98.7	336.1	140.0	98.7	336.1	137.2	102.8	329.4	133.1	109.2	319.5
	TSEW20D	23.8	16.8	57.2	23.8	17.0	57.0	23.1	18.0	55.4	22.4	19.1	53.7
	TSEW30D	35.0	25.3	84.0	35.0	25.3	84.0	34.0	26.7	81.6	33.0	28.2	79.2
	TSEW40D	48.1	32.8	115.5	48.1	32.8	115.6	46.9	34.7	112.5	45.4	36.8	109.1
	TSEW50D	59.5	42.7	142.9	59.5	42.8	142.9	57.8	45.2	138.7	56.0	47.6	134.6
	TSEW60D	70.6	50.5	169.6	70.6	50.5	169.6	68.8	52.9	165.2	66.8	55.7	160.4
	TSEW80D	91.6	65.8	220.0	91.6	65.8	220.0	89.3	69.2	214.4	86.8	73.1	208.4
	TSEW100D	115.5	82.7	277.4	115.6	82.8	277.5	112.6	86.7	270.5	109.5	91.5	262.8
	TSEW120D	149.6	107.3	359.1	149.3	107.6	358.5	145.0	113.3	348.2	140.6	119.4	337.7
	TSEW160D	187.9	136.0	451.2	188.0	136.0	451.3	182.4	142.3	437.8	176.7	149.2	424.2
	TSEW200D	240.4	170.4	577.3	240.4	170.4	577.3	234.6	179.0	563.3	227.4	189.8	546.1
	TSEW240D	279.9	197.4	672.1	279.9	197.4	672.1	274.4	205.8	658.8	266.1	218.5	638.9

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R410A refrigerant.
[2]kW = Total compressor input power at rated voltage.

TSEW Series Water Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Water Temperature											
		80°F			85°F			90°F			95°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
60°F	TSEW10S	13.0	8.3	31.3	13.0	8.4	31.2	12.6	8.8	30.3	12.2	9.3	29.4
	TSEW15S	19.1	12.6	45.9	19.1	12.7	45.9	18.5	13.3	44.5	18.0	14.1	43.2
	TSEW20S	26.2	16.4	62.9	26.2	16.5	62.8	25.5	17.5	61.2	24.7	18.5	59.4
	TSEW25S	32.5	21.6	78.1	32.4	21.7	77.8	31.5	22.8	75.6	30.5	24.1	73.3
	TSEW30S	38.4	25.6	92.3	38.4	25.7	92.2	37.4	27.0	89.7	36.3	28.3	87.2
	TSEW40S	49.9	33.2	119.9	49.9	33.2	119.9	48.6	35.0	116.7	47.2	36.8	113.4
	TSEW50S	62.9	42.0	151.1	62.9	42.1	151.0	61.2	44.1	147.0	59.5	46.4	143.0
	TSEW60S	81.5	54.4	195.7	81.1	54.7	194.8	78.8	57.6	189.3	76.4	60.6	183.6
	TSEW80S	102.8	68.5	246.9	102.6	68.7	246.5	99.6	71.9	239.1	96.5	75.3	231.8
	TSEW100S	131.2	84.8	315.0	131.2	84.8	315.1	127.8	89.7	306.8	123.9	95.3	297.5
	TSEW120S	152.6	97.9	366.4	152.6	97.9	366.4	149.3	102.7	358.5	145.0	109.5	348.1
	TSEW20D	26.1	16.7	62.6	25.9	16.8	62.3	25.2	17.8	60.6	24.5	18.9	58.8
	TSEW30D	38.2	25.3	91.9	38.2	25.4	91.7	37.1	26.8	89.0	36.0	28.4	86.4
	TSEW40D	52.3	32.9	125.7	52.3	33.0	125.6	50.9	34.9	122.3	49.5	37.1	118.8
	TSEW50D	65.0	43.2	156.1	64.8	43.4	155.6	62.9	45.7	151.2	61.0	48.2	146.6
	TSEW60D	76.9	51.4	184.6	76.8	51.5	184.4	74.7	53.9	179.5	72.6	56.7	174.3
	TSEW80D	99.9	66.5	239.9	99.8	66.5	239.8	97.2	70.0	233.4	94.5	73.9	226.8
	TSEW100D	125.8	84.0	302.1	125.7	84.2	302.0	122.4	88.2	294.1	119.1	92.9	286.0
	TSEW120D	162.9	108.8	391.3	162.2	109.6	389.6	157.6	115.2	378.5	152.9	121.4	367.1
	TSEW160D	205.6	137.1	493.8	205.2	137.5	492.9	199.1	143.8	478.2	193.0	150.6	463.6
	TSEW200D	262.3	169.6	630.1	262.4	169.7	630.1	255.5	179.5	613.7	247.7	190.7	595.0
	TSEW240D	305.1	195.8	732.8	305.1	195.8	732.8	298.6	205.5	717.1	289.9	219.0	696.3
65°F	TSEW10S	14.2	8.2	34.2	14.1	8.3	34.0	13.8	8.8	33.0	13.4	9.3	32.1
	TSEW15S	19.3	11.5	46.3	19.3	11.6	46.4	20.0	13.3	48.1	19.6	14.2	47.1
	TSEW20S	28.4	16.5	68.2	28.3	16.6	68.0	27.6	17.6	66.3	26.8	18.6	64.5
	TSEW25S	35.4	21.8	85.1	35.2	22.0	84.6	34.2	23.1	82.1	33.2	24.4	79.7
	TSEW30S	41.7	26.2	100.2	41.6	26.3	99.9	40.5	27.6	97.2	39.3	28.8	94.5
	TSEW40S	54.3	33.6	130.5	54.2	33.8	130.2	52.8	35.5	126.7	51.3	37.3	123.2
	TSEW50S	68.3	42.8	164.1	68.1	43.0	163.6	66.4	45.0	159.4	64.6	47.3	155.1
	TSEW60S	88.5	55.2	212.7	87.9	55.8	211.2	85.4	58.6	205.2	82.9	61.7	199.1
	TSEW80S	112.2	69.0	269.5	111.6	69.4	268.2	108.4	72.6	260.3	105.2	76.0	252.8
	TSEW100S	142.8	84.1	343.0	142.8	84.1	343.1	138.8	89.7	333.5	134.7	95.6	323.5
	TSEW120S	161.8	93.9	388.7	161.8	93.9	388.7	162.6	102.6	390.5	157.4	109.2	378.2
	TSEW20D	28.5	16.5	68.4	28.3	16.7	67.9	27.5	17.6	66.1	26.7	18.7	64.2
	TSEW30D	38.5	23.0	92.5	38.6	23.2	92.8	40.1	26.7	96.3	39.3	28.6	94.3
	TSEW40D	56.8	33.0	136.4	56.6	33.2	136.0	55.2	35.2	132.6	53.7	37.4	129.0
	TSEW50D	70.8	43.6	170.2	70.4	44.1	169.2	68.3	46.3	164.2	66.4	48.9	159.4
	TSEW60D	83.4	52.4	200.4	83.1	52.7	199.7	81.0	55.2	194.5	78.7	57.9	189.0
	TSEW80D	108.7	67.3	261.1	108.4	67.7	260.3	105.5	71.0	253.5	102.6	74.7	246.4
	TSEW100D	136.6	85.7	328.2	136.2	86.2	327.2	132.7	90.1	318.9	129.2	94.6	310.3
	TSEW120D	177.1	110.5	425.3	175.8	111.7	422.4	170.8	117.3	410.4	165.7	123.4	398.1
	TSEW160D	224.3	138.1	538.9	223.2	139.0	536.3	216.7	145.1	520.6	210.4	152.0	505.5
	TSEW200D	285.6	168.2	686.0	285.6	168.2	686.1	277.7	179.5	667.1	269.3	191.2	647.0
	TSEW240D	323.6	187.8	777.5	323.6	187.8	777.5	325.1	205.2	781.0	314.8	218.5	756.3

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R410A refrigerant.
[2]kW = Total compressor input power at rated voltage.

TSEW Series Water Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Water Temperature											
		80°F			85°F			90°F			95°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
70°F	TSEW10S	15.5	8.1	37.3	15.4	8.2	36.9	15.0	8.7	36.0	14.6	9.3	35.0
	TSEW15S	18.5	9.9	44.4	18.5	9.9	44.5	19.4	11.5	46.5	20.1	13.2	48.2
	TSEW20S	30.7	16.5	73.7	30.5	16.7	73.4	29.8	17.7	71.7	29.1	18.8	69.8
	TSEW25S	36.2	20.6	86.9	36.6	21.2	87.8	37.2	23.6	89.4	36.0	24.7	86.5
	TSEW30S	45.2	26.8	108.5	44.9	27.1	107.9	43.7	28.2	105.1	42.5	29.5	102.2
	TSEW40S	59.0	34.1	141.7	58.6	34.3	140.9	57.1	36.0	137.2	55.6	37.8	133.6
	TSEW50S	74.0	43.8	177.8	73.6	44.2	176.8	71.8	46.1	172.4	69.9	48.3	167.9
	TSEW60S	96.0	56.2	230.6	95.1	57.1	228.4	92.4	59.8	221.9	89.6	62.8	215.3
	TSEW80S	117.4	66.5	282.0	118.5	68.3	284.8	118.1	73.5	283.7	114.4	76.6	274.8
	TSEW100S	155.4	83.1	373.4	155.2	83.5	373.0	150.5	89.3	361.6	146.0	95.5	350.8
	TSEW120S	155.1	79.9	372.6	155.1	79.9	372.6	160.8	90.8	386.3	167.2	106.0	401.7
	TSEW20D	31.0	16.2	74.5	30.7	16.5	73.9	30.0	17.5	72.0	29.1	18.5	69.9
	TSEW30D	36.9	19.8	88.8	37.0	19.9	88.9	38.7	23.1	93.0	40.1	26.5	96.4
	TSEW40D	61.4	33.1	147.5	61.1	33.5	146.8	59.7	35.5	143.4	58.1	37.7	139.6
	TSEW50D	72.3	41.1	173.7	73.1	42.5	175.7	74.4	47.2	178.8	72.0	49.5	173.0
	TSEW60D	90.3	53.6	217.0	89.8	54.2	215.8	87.5	56.6	210.2	85.1	59.2	204.4
	TSEW80D	117.9	68.2	283.3	117.3	68.8	281.8	114.2	72.1	274.4	111.2	75.8	267.2
	TSEW100D	148.0	87.7	355.5	147.2	88.5	353.6	143.5	92.3	344.8	139.7	96.6	335.7
	TSEW120D	192.0	112.4	461.2	190.1	114.2	456.8	184.7	119.7	443.9	179.2	125.7	430.6
	TSEW160D	234.7	133.0	564.0	237.1	136.8	569.6	236.1	147.0	567.3	228.7	153.2	549.6
	TSEW200D	310.8	166.3	746.7	310.5	167.1	745.9	301.0	178.7	723.2	292.0	191.0	701.5
	TSEW240D	310.2	159.9	745.3	310.2	159.9	745.3	321.6	181.6	772.7	334.4	212.1	803.4
75°F	TSEW10S	16.9	8.0	40.6	16.7	8.1	40.1	16.3	8.6	39.1	15.8	9.1	38.0
	TSEW15S	17.6	8.5	42.2	17.6	8.5	42.2	18.5	9.9	44.5	19.3	11.4	46.5
	TSEW20S	33.1	16.6	79.5	32.9	16.8	79.0	32.2	17.9	77.3	31.4	19.0	75.4
	TSEW25S	34.4	17.9	82.7	34.8	18.5	83.6	36.6	21.3	87.9	38.1	24.4	91.5
	TSEW30S	48.8	27.5	117.2	48.4	27.9	116.3	47.2	29.1	113.3	45.9	30.4	110.2
	TSEW40S	62.6	33.9	150.3	63.4	35.1	152.4	61.8	36.7	148.6	60.1	38.4	144.5
	TSEW50S	79.9	45.0	192.1	79.3	45.5	190.6	77.4	47.4	185.9	75.3	49.4	181.1
	TSEW60S	103.8	57.3	249.6	102.6	58.5	246.5	99.6	61.1	239.5	96.7	64.2	232.3
	TSEW80S	111.6	57.7	268.2	112.7	59.1	270.8	118.7	67.7	285.2	123.6	76.8	296.9
	TSEW100S	148.3	70.4	356.3	148.3	70.4	356.4	156.7	84.4	376.6	158.2	95.2	380.2
	TSEW120S	147.2	66.9	353.8	147.2	66.9	353.8	153.3	76.4	368.4	160.8	90.7	386.4
	TSEW20D	33.8	16.0	81.1	33.4	16.4	80.2	32.5	17.3	78.2	31.6	18.3	76.0
	TSEW30D	35.1	17.0	84.4	35.1	17.0	84.4	37.0	19.8	89.0	38.7	22.9	93.0
	TSEW40D	66.2	33.2	159.0	65.8	33.7	158.0	64.3	35.7	154.5	62.7	37.9	150.7
	TSEW50D	68.8	35.9	165.4	69.6	37.0	167.3	73.2	42.7	175.9	76.2	48.9	183.1
	TSEW60D	97.6	55.2	234.5	96.8	55.9	232.6	94.3	58.2	226.6	91.7	60.7	220.4
	TSEW80D	125.1	67.8	300.6	126.8	70.3	304.8	123.7	73.5	297.2	120.2	76.9	288.9
	TSEW100D	159.8	90.1	384.1	158.6	91.2	381.1	154.7	94.8	371.8	150.7	99.0	362.1
	TSEW120D	207.7	114.7	499.1	205.1	116.9	492.9	199.3	122.4	478.9	193.3	128.3	464.5
	TSEW160D	223.2	115.4	536.3	225.4	118.2	541.7	237.4	135.4	570.4	247.1	153.7	593.8
	TSEW200D	296.5	140.9	712.6	296.6	140.9	712.7	313.4	168.9	753.1	316.4	190.5	760.4
	TSEW240D	294.5	133.9	707.7	294.5	133.9	707.7	306.6	152.8	736.8	321.6	181.5	772.8

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R410A refrigerant.
[2]kW = Total compressor input power at rated voltage.

TSEW Series Water Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Water Temperature											
		80°F			85°F			90°F			95°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
80°F	TSEW10S	17.4	7.6	41.8	17.6	7.8	42.3	17.6	8.5	42.3	17.2	9.0	41.2
	TSEW15S	17.4	8.2	41.8	16.9	7.6	40.6	17.8	8.8	42.9	18.7	10.1	45.0
	TSEW20S	33.7	16.0	81.0	33.7	16.0	81.0	34.6	18.0	83.1	33.8	19.1	81.1
	TSEW25S	33.7	17.1	81.0	33.1	16.3	79.5	35.0	18.8	84.1	36.6	21.5	87.9
	TSEW30S	51.1	28.1	122.9	52.0	28.9	125.0	50.7	30.0	121.9	49.4	31.3	118.7
	TSEW40S	60.3	31.1	144.9	61.2	32.2	147.1	64.4	36.7	154.8	63.6	39.0	152.9
	TSEW50S	84.7	46.1	203.5	83.7	46.7	201.3	81.5	48.5	195.8	79.1	50.4	190.1
	TSEW60S	109.4	58.1	263.0	107.7	59.4	258.8	104.2	62.0	250.5	100.7	64.9	242.1
	TSEW80S	109.4	54.9	263.0	110.5	56.1	265.5	116.3	63.7	279.6	121.3	72.0	291.6
	TSEW100S	143.2	63.2	344.1	143.2	63.2	344.1	151.4	75.2	363.9	158.7	88.7	381.5
	TSEW120S	143.2	61.2	344.1	143.2	61.2	344.1	149.0	69.3	358.1	156.7	82.4	376.5
	TSEW20D	34.8	15.3	83.5	35.2	15.6	84.5	35.2	17.1	84.7	34.3	18.1	82.5
	TSEW30D	34.8	16.5	83.5	33.8	15.2	81.2	35.7	17.6	85.8	37.4	20.3	89.9
	TSEW40D	67.4	32.0	162.0	67.4	32.0	161.9	69.1	36.0	166.1	67.5	38.2	162.3
	TSEW50D	67.4	34.2	162.0	66.2	32.8	159.1	70.0	37.7	168.2	73.2	43.0	175.9
	TSEW60D	102.2	56.2	245.7	104.0	57.8	250.0	101.5	60.1	243.8	98.8	62.6	237.4
	TSEW80D	120.6	62.3	289.8	122.4	64.4	294.3	128.8	73.4	309.6	127.3	78.1	305.9
	TSEW100D	169.3	92.2	406.9	167.5	93.5	402.5	162.9	96.9	391.6	158.2	100.8	380.3
	TSEW120D	218.9	116.4	526.1	215.4	119.0	517.6	208.5	124.2	501.0	201.5	130.0	484.2
	TSEW160D	218.9	109.8	526.1	220.9	112.1	530.9	232.7	127.5	559.2	242.6	144.1	583.1
	TSEW200D	286.4	126.4	688.3	286.4	126.4	688.3	302.8	150.4	727.7	317.5	177.4	763.0
	TSEW240D	286.4	122.4	688.3	286.4	122.4	688.3	298.0	138.6	716.2	313.3	164.7	753.0

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R410A refrigerant.
[2]kW = Total compressor input power at rated voltage.

TSER Series Remote Air Cooled Condenser Chiller Cooling Capacities - 60 Hz

Leaving Coolant Temp	Model	Entering Condenser Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
20°F	TSER10S	5.7	8.8	16.0	5.8	9.1	16.0	5.5	9.5	15.2	5.5	10.1	15.3
	TSER15S	8.8	12.3	24.5	8.8	12.3	24.6	8.6	13.0	23.9	8.8	13.8	24.5
	TSER20S	11.9	16.0	33.3	12.0	16.2	33.4	11.4	17.1	31.9	11.6	18.6	32.3
	TSER25S	15.1	20.3	42.1	15.1	20.4	42.2	14.6	21.5	40.7	15.0	23.1	41.8
	TSER30S	17.9	23.8	49.8	17.9	23.8	50.0	17.3	25.0	48.3	17.6	26.8	49.0
	TSER40S	23.3	31.8	65.0	23.3	32.0	64.9	22.6	34.8	62.9	21.8	35.8	60.8
	TSER50S	29.0	39.8	80.8	28.9	40.3	80.5	27.9	42.7	77.8	26.9	45.5	75.0
	TSER60S	37.6	50.6	104.8	37.6	50.6	104.9	36.5	53.4	101.7	35.2	56.5	98.3
	TSER80S	47.1	63.1	131.3	47.0	63.4	131.2	45.4	66.7	126.7	43.8	70.3	122.3
	TSER100S	60.8	82.3	169.6	60.5	83.4	168.7	58.5	87.8	163.1	56.6	92.9	157.8
	TSER120S	70.9	96.0	197.7	71.0	96.1	198.0	68.7	101.1	191.6	66.5	106.6	185.6
	TSER20D	11.5	18.0	32.0	11.5	18.0	32.1	11.2	18.7	31.1	11.3	19.8	31.5
	TSER30D	17.6	24.8	49.1	17.6	24.8	49.2	17.1	26.0	47.8	17.6	27.9	49.1
	TSER40D	23.9	32.4	66.6	24.0	33.6	66.8	22.9	34.7	63.8	23.2	37.4	64.6
	TSER50D	30.2	40.8	84.2	30.3	42.0	84.4	29.2	43.1	81.5	30.0	46.2	83.7
	TSER60D	35.7	47.6	99.7	35.8	47.7	99.9	34.6	50.2	96.6	35.2	53.7	98.1
	TSER80D	46.6	63.8	129.9	46.6	65.9	129.9	45.1	69.6	125.8	43.6	71.8	121.6
	TSER100D	57.9	79.7	161.5	57.7	80.5	161.1	55.8	88.0	155.6	53.7	91.0	149.9
	TSER120D	75.1	101.2	209.5	75.2	101.3	209.8	72.9	106.8	203.5	70.5	116.1	196.7
	TSER160D	94.1	126.3	262.6	94.1	127.1	262.5	90.8	136.4	253.4	87.7	143.8	244.6
	TSER200D	121.6	164.8	339.2	121.0	167.0	337.5	117.0	175.9	326.3	113.1	185.9	315.6
	TSER240D	141.7	192.0	395.4	141.9	192.3	395.9	137.4	202.3	383.2	133.1	218.0	371.2
25°F	TSER10S	6.5	8.9	17.5	6.4	9.0	17.4	6.1	9.5	16.6	5.8	9.9	15.9
	TSER15S	9.8	12.4	26.5	9.8	12.4	26.5	9.5	13.2	25.7	9.2	14.0	24.8
	TSER20S	13.4	16.1	36.2	13.3	16.4	36.0	12.8	17.6	34.6	12.2	18.7	33.1
	TSER25S	16.8	20.5	45.4	16.6	20.7	45.1	16.1	21.9	43.8	15.6	23.3	42.2
	TSER30S	19.9	23.9	53.9	19.8	24.1	53.7	19.2	25.5	52.0	18.5	26.9	50.2
	TSER40S	25.9	32.0	70.2	25.7	32.6	69.6	24.8	34.3	67.4	24.1	36.5	65.3
	TSER50S	32.3	39.8	87.6	32.0	40.8	86.6	30.9	43.3	83.7	29.8	46.0	80.9
	TSER60S	41.9	50.9	113.5	41.7	51.3	113.2	40.4	54.3	109.5	39.0	57.4	105.8
	TSER80S	52.3	64.0	141.8	51.8	65.1	140.5	50.0	68.4	135.6	48.3	72.1	131.0
	TSER100S	67.6	83.0	183.2	66.7	85.1	180.8	64.5	89.5	174.8	62.3	94.4	169.1
	TSER120S	78.7	96.8	213.4	78.3	98.1	212.2	75.7	103.0	205.4	73.3	108.6	198.7
	TSER20D	12.9	17.8	35.0	13.0	18.0	35.1	12.5	18.7	34.0	12.0	19.9	32.4
	TSER30D	19.6	24.9	53.0	19.6	25.0	53.0	19.0	26.5	51.4	18.3	27.9	49.7
	TSER40D	26.7	32.3	72.5	26.6	32.9	72.0	25.5	35.1	69.2	24.4	37.5	66.1
	TSER50D	33.5	41.0	90.9	33.3	41.5	90.4	32.3	44.0	87.7	31.2	46.6	84.6
	TSER60D	39.8	47.9	107.9	39.6	48.4	107.5	38.4	51.3	104.0	37.0	54.1	100.4
	TSER80D	51.7	63.9	140.3	51.3	65.2	139.2	49.7	68.9	134.8	48.2	73.1	130.6
	TSER100D	64.6	79.7	175.2	63.9	81.7	173.3	61.7	86.6	167.3	59.6	92.2	161.7
	TSER120D	83.7	101.8	227.0	83.5	102.9	226.3	80.7	108.6	218.9	78.0	115.0	211.6
	TSER160D	104.6	128.2	283.5	103.6	130.4	281.0	100.0	136.9	271.2	96.6	144.3	262.1
	TSER200D	135.1	166.1	366.3	133.3	170.1	361.6	128.9	179.0	349.6	124.7	189.2	338.1
	TSER240D	157.4	193.7	426.7	156.5	196.2	424.5	151.5	206.3	410.7	146.6	217.4	397.5

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, R410A refrigerant, and operating at sea level.

[2]kW = Total compressor input power at rated voltage.

TSER Series Remote Air Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
30°F	TSER10S	7.2	8.7	19.1	7.1	9.1	18.7	6.8	9.5	18.0	6.5	10.1	17.3
	TSER15S	10.8	12.4	28.6	10.8	12.7	28.4	10.4	13.3	27.5	10.1	14.1	26.7
	TSER20S	14.9	16.1	39.3	14.7	16.6	38.7	14.1	17.7	37.2	13.6	19.0	35.8
	TSER25S	18.6	20.6	49.0	18.3	21.2	48.3	17.7	22.3	46.8	17.2	23.8	45.3
	TSER30S	22.1	24.1	58.2	21.8	24.5	57.6	21.1	25.9	55.7	20.4	27.4	53.9
	TSER40S	28.7	32.1	75.6	28.2	33.1	74.5	27.3	34.9	72.2	26.5	37.0	69.9
	TSER50S	35.9	39.9	94.8	35.2	41.3	93.0	34.1	43.9	89.9	32.9	46.6	86.9
	TSER60S	46.5	51.2	122.8	46.0	52.3	121.4	44.5	55.2	117.6	43.1	58.5	113.7
	TSER80S	58.0	64.9	153.0	56.9	66.7	150.3	55.0	70.1	145.2	53.1	73.7	140.3
	TSER100S	74.9	83.7	197.6	73.3	86.8	193.4	70.9	91.4	187.1	68.5	96.3	180.9
	TSER120S	87.2	97.6	230.1	86.0	100.0	227.0	83.3	105.2	219.8	80.6	110.8	212.7
	TSER20D	14.5	17.8	38.2	14.5	17.8	38.2	13.9	18.8	36.7	13.4	20.0	35.3
	TSER30D	21.7	25.0	57.2	21.5	25.3	56.8	20.8	26.7	55.0	20.2	28.4	53.4
	TSER40D	29.8	32.4	78.7	29.3	33.3	77.4	28.2	35.5	74.4	27.1	38.0	71.6
	TSER50D	37.1	41.2	98.0	36.6	42.3	96.7	35.5	44.8	93.7	34.4	47.6	90.8
	TSER60D	44.1	48.1	116.5	43.6	49.2	115.2	42.2	52.0	111.4	40.9	55.2	107.9
	TSER80D	57.3	64.2	151.2	56.4	66.3	148.9	54.7	70.1	144.3	53.0	74.3	139.8
	TSER100D	71.8	79.9	189.6	70.5	83.0	186.0	68.1	87.8	179.9	65.8	93.3	173.7
	TSER120D	93.0	102.5	245.5	92.0	104.8	242.8	89.1	110.7	235.1	86.1	117.0	227.4
	TSER160D	115.9	129.8	305.9	113.9	133.6	300.5	110.0	140.3	290.3	106.3	147.8	280.5
	TSER200D	149.7	167.4	395.2	146.5	173.7	386.8	141.8	182.9	374.2	137.1	192.9	361.7
	TSER240D	174.3	195.2	460.1	172.0	200.1	454.1	166.6	210.5	439.6	161.2	221.7	425.4
35°F	TSER10S	8.1	8.8	20.8	7.8	9.1	20.2	7.5	9.6	19.4	7.2	10.1	18.6
	TSER15S	12.0	12.5	30.8	11.8	12.8	30.4	11.4	13.4	29.4	11.1	14.3	28.5
	TSER20S	16.5	16.1	42.6	16.1	16.8	41.5	15.5	17.9	40.0	14.9	19.0	38.5
	TSER25S	20.5	20.7	52.7	20.0	21.5	51.6	19.4	22.8	50.0	18.8	24.1	48.4
	TSER30S	24.4	24.2	62.8	23.9	25.0	61.6	23.2	26.4	59.7	22.4	27.9	57.7
	TSER40S	31.6	32.1	81.4	30.9	33.6	79.5	30.0	35.6	77.1	29.1	37.7	74.7
	TSER50S	39.8	40.0	102.4	38.7	42.1	99.6	37.5	44.6	96.4	36.2	47.2	93.2
	TSER60S	51.5	51.6	132.5	50.5	53.4	130.0	49.0	56.4	126.0	47.4	59.6	121.9
	TSER80S	64.1	65.5	165.0	62.4	68.3	160.6	60.4	71.8	155.3	58.4	75.6	150.1
	TSER100S	82.8	84.4	212.9	80.3	88.7	206.5	77.7	93.3	200.0	75.1	98.3	193.3
	TSER120S	96.3	98.2	247.8	94.3	102.0	242.5	91.3	107.3	235.0	88.4	113.1	227.3
	TSER20D	16.1	17.5	41.5	16.0	17.9	41.1	15.4	18.8	39.7	14.8	19.9	38.1
	TSER30D	23.9	24.9	61.6	23.6	25.7	60.7	22.9	27.2	58.9	22.2	28.9	57.0
	TSER40D	33.1	32.5	85.1	32.3	33.9	83.0	31.1	36.0	80.0	29.9	38.5	76.9
	TSER50D	41.0	41.5	105.4	40.1	43.2	103.2	38.9	45.7	100.1	37.7	48.4	96.9
	TSER60D	48.8	48.5	125.6	47.9	50.3	123.2	46.4	53.0	119.3	44.8	55.9	115.4
	TSER80D	63.3	64.5	162.8	61.8	67.4	159.1	60.0	71.3	154.3	58.1	75.5	149.5
	TSER100D	79.6	80.2	204.7	77.4	84.3	199.2	75.0	89.4	192.9	72.5	94.8	186.5
	TSER120D	103.0	103.3	264.9	101.0	106.9	259.9	97.9	112.9	251.9	94.7	119.3	243.7
	TSER160D	128.3	131.3	330.0	124.8	136.7	321.2	120.7	143.6	310.6	116.7	151.1	300.3
	TSER200D	165.5	168.7	425.8	160.6	177.5	413.1	155.4	186.8	399.9	150.3	197.0	386.6
	TSER240D	192.6	196.6	495.6	188.5	204.1	485.1	182.6	214.8	469.9	176.7	226.2	454.7

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, R410A refrigerant, and operating at sea level.

[2]kW = Total compressor input power at rated voltage.

TSER Series Remote Air Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
40°F	TSER10S	8.9	8.7	22.4	8.6	9.2	21.6	8.3	9.7	20.9	8.0	10.3	20.1
	TSER15S	13.2	12.5	33.1	12.9	13.0	32.4	12.5	13.7	31.5	12.1	14.5	30.5
	TSER20S	18.3	16.2	45.9	17.7	17.2	44.4	17.1	18.3	42.9	16.4	19.4	41.3
	TSER25S	22.6	20.9	56.7	21.9	22.0	55.0	21.2	23.2	53.3	20.6	24.7	51.6
	TSER30S	26.9	24.4	67.6	26.2	25.6	65.7	25.4	27.0	63.7	24.6	28.5	61.7
	TSER40S	34.8	32.5	87.4	33.8	34.3	84.8	32.8	36.2	82.3	31.8	38.3	79.8
	TSER50S	43.7	40.6	109.7	42.4	42.9	106.4	41.1	45.4	103.2	39.8	48.2	99.8
	TSER60S	56.8	52.0	142.7	55.3	54.6	138.8	53.6	57.6	134.6	51.9	60.8	130.3
	TSER80S	70.6	66.8	177.2	68.3	69.9	171.5	66.1	73.4	166.0	63.9	77.1	160.5
	TSER100S	90.5	86.1	227.3	87.7	90.6	220.2	84.9	95.4	213.3	82.1	100.5	206.2
	TSER120S	106.2	98.8	266.7	103.0	104.0	258.7	99.9	109.7	250.8	96.6	115.4	242.7
	TSER20D	17.9	17.5	44.9	17.6	17.9	44.2	17.0	19.0	42.7	16.4	20.1	41.1
	TSER30D	26.4	25.1	66.3	25.8	26.1	64.8	25.1	27.7	62.9	24.3	29.3	61.0
	TSER40D	36.6	32.6	91.9	35.4	34.5	88.8	34.2	36.7	85.8	32.9	39.1	82.6
	TSER50D	45.2	41.9	113.4	43.9	44.2	110.1	42.5	46.6	106.8	41.2	49.3	103.4
	TSER60D	53.8	48.8	135.2	52.4	51.3	131.5	50.8	54.1	127.5	49.1	57.1	123.3
	TSER80D	69.6	65.1	174.7	67.6	68.7	169.7	65.6	72.6	164.7	63.6	76.9	159.6
	TSER100D	87.4	81.4	219.5	84.8	85.9	212.9	82.2	91.0	206.3	79.5	96.4	199.6
	TSER120D	113.6	104.0	285.4	110.5	109.1	277.6	107.2	115.3	269.3	103.8	121.8	260.6
	TSER160D	141.2	133.7	354.4	136.6	139.9	342.9	132.2	146.9	332.0	127.9	154.5	321.1
	TSER200D	181.0	172.3	454.5	175.4	181.3	440.4	169.9	191.1	426.6	164.3	201.4	412.5
	TSER240D	212.4	197.7	533.3	206.1	208.3	517.4	199.7	219.3	501.5	193.3	231.2	485.3
45°F	TSER10S	9.8	8.8	23.4	9.5	9.3	22.7	9.1	9.7	21.9	8.8	10.3	21.1
	TSER15S	14.6	12.6	34.9	14.1	13.2	33.9	13.7	14.0	32.9	13.3	14.8	31.9
	TSER20S	20.0	16.5	48.0	19.3	17.4	46.4	18.7	18.6	44.9	18.0	19.7	43.3
	TSER25S	24.6	21.3	59.1	23.9	22.5	57.3	23.2	23.8	55.6	22.4	25.1	53.8
	TSER30S	29.4	24.8	70.6	28.6	26.2	68.6	27.7	27.5	66.5	26.8	29.0	64.4
	TSER40S	38.0	33.2	91.1	36.9	35.0	88.5	35.8	36.9	85.9	34.7	39.0	83.3
	TSER50S	47.7	41.5	114.5	46.3	43.8	111.1	44.9	46.3	107.8	43.5	49.0	104.4
	TSER60S	62.2	53.0	149.3	60.4	55.8	144.8	58.6	58.9	140.5	56.7	62.2	136.0
	TSER80S	77.1	68.3	184.9	74.6	71.4	179.1	72.3	75.0	173.5	70.0	78.9	167.8
	TSER100S	98.7	87.9	236.7	95.7	92.6	229.5	92.7	97.6	222.4	89.6	102.9	215.0
	TSER120S	116.0	100.7	278.2	112.5	106.2	269.8	109.0	111.9	261.6	105.5	117.9	253.1
	TSER20D	19.8	17.3	47.4	19.3	18.0	46.3	18.7	19.0	44.8	18.0	20.1	43.3
	TSER30D	29.1	25.2	69.8	28.2	26.5	67.7	27.4	28.1	65.8	26.6	29.8	63.8
	TSER40D	40.0	33.2	95.9	38.7	35.1	92.8	37.4	37.3	89.8	36.1	39.7	86.6
	TSER50D	49.3	42.7	118.3	47.9	45.1	114.8	46.5	47.7	111.4	45.0	50.4	107.9
	TSER60D	58.9	49.9	141.3	57.2	52.5	137.1	55.5	55.3	133.0	53.7	58.4	128.7
	TSER80D	75.9	66.4	182.1	73.7	69.9	176.9	71.6	74.0	171.8	69.4	78.2	166.6
	TSER100D	95.4	83.2	228.9	92.6	87.7	222.2	89.9	92.8	215.6	87.0	98.3	208.8
	TSER120D	124.4	106.2	298.5	120.7	111.7	289.6	117.2	118.0	281.1	113.4	124.5	272.1
	TSER160D	154.2	136.7	369.8	149.3	143.1	358.1	144.6	150.2	347.0	139.9	157.8	335.7
	TSER200D	197.4	175.9	473.5	191.3	185.3	459.0	185.4	195.4	444.8	179.3	206.0	430.0
	TSER240D	232.0	201.5	556.5	224.9	212.3	539.6	218.1	224.0	523.2	211.0	236.0	506.3

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, R410A refrigerant, and operating at sea level.

[2]kW = Total compressor input power at rated voltage.

TSER Series Remote Air Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
50°F	TSER10S	10.6	8.8	25.5	10.3	9.3	24.8	10.0	9.9	24.0	9.6	10.3	23.1
	TSER15S	15.8	12.7	38.0	15.4	13.5	36.9	14.9	14.2	35.8	14.5	15.1	34.7
	TSER20S	21.7	16.9	52.1	21.0	17.8	50.5	20.4	19.0	48.9	19.7	20.2	47.2
	TSER25S	26.7	21.8	64.1	25.9	23.0	62.2	25.2	24.4	60.4	24.4	25.7	58.5
	TSER30S	31.9	25.5	76.6	31.0	26.8	74.4	30.1	28.2	72.3	29.1	29.7	69.9
	TSER40S	41.2	33.9	98.8	40.0	35.6	96.1	38.9	37.7	93.3	37.7	39.8	90.5
	TSER50S	51.8	42.6	124.3	50.3	44.8	120.7	48.9	47.4	117.3	47.3	50.1	113.6
	TSER60S	67.5	54.4	162.0	65.5	57.1	157.2	63.6	60.3	152.7	61.6	63.6	147.8
	TSER80S	83.8	69.8	201.0	81.2	73.1	194.8	78.7	76.6	188.9	76.2	80.5	182.9
	TSER100S	107.1	89.7	256.9	103.8	94.5	249.2	100.6	99.8	241.5	97.3	105.2	233.5
	TSER120S	125.9	102.4	302.1	122.1	108.1	293.1	118.5	114.3	284.3	114.6	120.4	275.1
	TSER20D	21.7	17.1	52.2	21.1	18.1	50.6	20.4	19.0	49.0	19.8	20.3	47.4
	TSER30D	31.6	25.6	76.0	30.7	27.0	73.7	29.8	28.6	71.6	28.9	30.2	69.4
	TSER40D	43.4	33.8	104.1	42.1	35.8	100.9	40.7	38.0	97.8	39.3	40.4	94.4
	TSER50D	53.5	43.7	128.5	52.0	46.1	124.7	50.4	48.6	121.1	48.8	51.3	117.2
	TSER60D	63.9	51.2	153.3	62.0	53.7	148.8	60.2	56.6	144.5	58.3	59.6	139.9
	TSER80D	82.4	67.8	197.7	80.0	71.4	192.1	77.8	75.5	186.7	75.4	79.8	181.0
	TSER100D	103.5	85.2	248.5	100.6	89.7	241.5	97.7	94.9	234.5	94.6	100.3	227.1
	TSER120D	135.0	108.9	324.0	131.0	114.4	314.5	127.2	120.7	305.3	123.2	127.4	295.6
	TSER160D	167.5	139.7	402.1	162.4	146.2	389.7	157.5	153.6	377.9	152.4	161.2	365.7
	TSER200D	214.1	179.4	513.9	207.7	189.3	498.4	201.3	199.9	483.1	194.6	210.6	467.1
	TSER240D	251.8	204.9	604.3	244.2	216.3	586.1	236.9	228.6	568.6	229.2	240.9	550.2
55°F	TSER10S	11.6	8.9	27.8	11.2	9.3	26.9	10.9	9.9	26.1	10.5	10.5	25.2
	TSER15S	17.2	13.0	41.2	16.7	13.7	40.0	16.2	14.5	38.9	15.7	15.3	37.7
	TSER20S	23.5	17.2	56.4	22.8	18.2	54.7	22.1	19.3	53.1	21.4	20.6	51.3
	TSER25S	28.9	22.4	69.5	28.1	23.6	67.5	27.3	24.9	65.5	26.4	26.3	63.4
	TSER30S	34.5	26.2	82.9	33.6	27.6	80.6	32.6	29.0	78.2	31.6	30.5	75.8
	TSER40S	44.6	34.6	107.0	43.3	36.4	104.1	42.1	38.4	101.2	40.9	40.7	98.1
	TSER50S	56.0	43.7	134.5	54.5	46.0	130.8	52.9	48.5	127.1	51.3	51.3	123.2
	TSER60S	73.0	55.8	175.3	70.9	58.6	170.2	68.9	61.9	165.3	66.7	65.2	160.0
	TSER80S	90.8	71.3	218.1	88.1	74.6	211.6	85.5	78.3	205.3	82.8	82.2	198.8
	TSER100S	115.9	91.5	278.2	112.4	96.6	269.9	109.0	102.1	261.6	105.4	107.7	253.0
	TSER120S	136.3	104.0	327.3	132.3	110.1	317.6	128.4	116.5	308.2	124.2	122.9	298.2
	TSER20D	23.6	17.1	56.7	22.9	18.1	55.1	22.3	19.2	53.4	21.5	20.2	51.7
	TSER30D	34.3	26.1	82.4	33.3	27.5	80.1	32.4	29.1	77.8	31.4	30.8	75.5
	TSER40D	46.9	34.4	112.7	45.6	36.5	109.4	44.2	38.8	106.1	42.7	41.2	102.6
	TSER50D	58.0	44.8	139.2	56.3	47.2	135.1	54.7	49.9	131.2	52.9	52.5	127.0
	TSER60D	69.1	52.6	165.8	67.1	55.1	161.1	65.2	58.1	156.5	63.1	61.1	151.5
	TSER80D	89.1	69.3	214.0	86.7	73.0	208.1	84.3	77.2	202.3	81.7	81.4	196.2
	TSER100D	112.0	87.5	269.0	108.9	92.0	261.6	105.9	97.3	254.2	102.6	102.7	246.3
	TSER120D	146.1	111.8	350.7	141.8	117.4	340.5	137.7	123.8	330.6	133.3	130.4	320.1
	TSER160D	181.7	142.8	436.2	176.3	149.4	423.2	171.0	156.7	410.6	165.6	164.5	397.5
	TSER200D	231.7	182.9	556.4	224.8	193.3	539.7	217.9	204.2	523.3	210.7	215.4	505.9
	TSER240D	272.7	208.3	654.7	264.6	220.3	635.2	256.7	233.0	616.3	248.4	245.9	596.4

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, R410A refrigerant, and operating at sea level.

[2]kW = Total compressor input power at rated voltage.

TSER Series Remote Air Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
60°F	TSER10S	12.5	8.9	30.1	12.2	9.5	29.2	11.8	10.0	28.4	11.4	10.5	27.4
	TSER15S	18.6	13.2	44.6	18.1	14.0	43.4	17.5	14.7	42.0	17.0	15.6	40.8
	TSER20S	25.3	17.5	60.8	24.6	18.6	59.1	23.9	19.7	57.4	23.1	20.9	55.5
	TSER25S	31.3	23.0	75.1	30.4	24.2	72.9	29.5	25.6	70.8	28.5	26.9	68.5
	TSER30S	37.2	27.0	89.4	36.2	28.3	86.9	35.2	29.8	84.5	34.1	31.3	81.8
	TSER40S	48.1	35.4	115.6	46.8	37.3	112.5	45.5	39.3	109.4	44.2	41.6	106.0
	TSER50S	60.4	45.0	145.1	58.8	47.3	141.2	57.2	49.9	137.3	55.4	52.6	133.1
	TSER60S	78.8	57.4	189.2	76.5	60.3	183.7	74.3	63.5	178.4	71.9	66.8	172.7
	TSER80S	98.3	72.9	236.1	95.4	76.2	229.2	92.7	80.1	222.5	89.7	83.8	215.5
	TSER100S	125.1	93.2	300.5	121.4	98.6	291.5	117.7	104.3	282.7	113.8	110.1	273.3
	TSER120S	147.0	105.3	353.0	142.6	111.5	342.6	138.5	118.4	332.5	134.2	125.3	322.4
	TSER20D	25.6	17.2	61.6	24.9	18.2	59.8	24.2	19.2	58.1	23.4	20.3	56.3
	TSER30D	37.2	26.6	89.3	36.1	28.0	86.7	35.0	29.5	84.0	34.0	31.3	81.6
	TSER40D	50.7	35.3	121.7	49.2	37.3	118.3	47.8	39.6	114.8	46.2	42.0	111.1
	TSER50D	62.6	45.9	150.4	60.8	48.3	146.1	59.1	51.1	141.9	57.2	53.8	137.3
	TSER60D	74.5	54.2	178.8	72.4	56.8	173.9	70.3	59.6	168.9	68.1	62.7	163.6
	TSER80D	96.3	71.1	231.2	93.6	74.7	224.9	91.1	79.0	218.7	88.3	83.3	212.1
	TSER100D	120.9	90.2	290.3	117.6	94.7	282.5	114.3	99.8	274.6	110.8	105.3	266.2
	TSER120D	157.6	115.0	378.4	153.0	120.7	367.5	148.6	127.2	356.9	143.9	133.9	345.5
	TSER160D	196.7	146.0	472.3	190.9	152.7	458.5	185.3	160.1	445.1	179.5	167.8	431.0
	TSER200D	250.2	186.5	600.9	242.8	197.4	583.1	235.4	208.8	565.3	227.6	220.4	546.6
	TSER240D	294.0	210.7	706.0	285.3	223.3	685.2	276.9	236.7	665.1	268.5	250.9	644.8
65°F	TSER10S	13.6	9.0	32.6	13.2	9.5	31.7	12.8	10.1	30.7	12.4	10.7	29.7
	TSER15S	20.0	13.4	48.1	19.7	14.4	47.2	18.9	14.9	45.5	18.3	15.7	44.1
	TSER20S	27.3	18.0	65.5	26.5	19.0	63.7	25.8	20.2	61.9	24.9	21.4	59.9
	TSER25S	33.6	23.5	80.8	32.6	24.7	78.4	31.6	26.0	75.9	30.7	27.5	73.7
	TSER30S	40.0	27.9	96.2	38.9	29.2	93.6	37.8	30.6	90.9	36.7	32.3	88.1
	TSER40S	51.9	36.5	124.6	50.5	38.3	121.2	49.1	40.4	117.9	47.6	42.6	114.3
	TSER50S	65.0	46.5	156.2	63.3	48.8	152.1	61.6	51.4	147.9	59.7	54.1	143.4
	TSER60S	84.8	59.2	203.6	82.3	62.1	197.8	79.9	65.3	192.0	77.4	68.8	185.8
	TSER80S	106.0	74.4	254.6	102.8	77.5	246.9	99.8	81.2	239.8	97.0	85.5	233.0
	TSER100S	134.6	94.7	323.5	130.6	100.4	313.8	126.7	106.4	304.4	122.6	112.6	294.5
	TSER120S	159.4	107.8	382.9	153.9	113.5	369.8	148.8	119.8	357.5	144.1	126.9	346.2
	TSER20D	27.8	17.3	66.7	27.0	18.2	64.9	26.2	19.3	63.0	25.4	20.4	61.1
	TSER30D	40.0	26.8	96.2	39.3	28.8	94.5	37.9	30.1	91.0	36.7	31.7	88.1
	TSER40D	54.5	36.0	131.0	53.1	38.2	127.5	51.5	40.5	123.8	49.9	43.0	119.8
	TSER50D	67.4	47.0	162.0	65.4	49.4	157.2	63.3	51.8	152.1	61.5	54.9	147.7
	TSER60D	80.1	56.0	192.4	77.9	58.6	187.1	75.7	61.5	181.8	73.3	64.5	176.1
	TSER80D	103.7	72.9	249.2	100.9	76.7	242.5	98.2	80.9	235.8	95.2	85.3	228.7
	TSER100D	130.1	93.1	312.4	126.6	97.7	304.2	123.1	102.8	295.8	119.4	108.3	286.8
	TSER120D	169.5	118.5	407.2	164.6	124.3	395.5	159.8	130.8	384.0	154.7	137.5	371.7
	TSER160D	212.0	148.8	509.3	205.6	155.2	493.8	199.6	162.5	479.6	194.0	171.1	466.1
	TSER200D	269.3	189.6	646.9	261.3	201.0	627.6	253.4	213.0	608.8	245.2	225.3	589.0
	TSER240D	318.8	215.7	765.8	307.9	227.3	739.6	297.7	239.9	715.1	288.2	253.9	692.4

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, R410A refrigerant, and operating at sea level.

[2]kW = Total compressor input power at rated voltage.

TSER Series Remote Air Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
70°F	TSER10S	14.6	9.0	35.2	14.2	9.5	34.2	13.8	10.1	33.2	13.4	10.7	32.1
	TSER15S	19.3	11.4	46.4	20.1	13.4	48.3	20.7	15.5	49.6	19.9	16.2	47.8
	TSER20S	29.3	18.4	70.3	28.5	19.5	68.4	27.7	20.7	66.5	26.8	21.9	64.5
	TSER25S	36.5	24.6	87.7	35.2	25.5	84.6	34.0	26.7	81.7	32.9	28.1	79.0
	TSER30S	43.0	29.0	103.2	41.8	30.3	100.4	40.6	31.7	97.6	39.3	33.2	94.5
	TSER40S	55.6	37.3	133.7	54.1	39.2	129.9	52.6	41.2	126.3	51.2	43.7	122.9
	TSER50S	69.8	48.2	167.7	68.0	50.5	163.3	66.1	53.0	158.8	64.1	55.7	154.1
	TSER60S	91.0	61.2	218.6	88.3	64.1	212.3	85.7	67.3	206.0	83.0	70.8	199.3
	TSER80S	114.8	76.6	275.9	110.9	79.3	266.5	107.4	82.6	258.1	104.1	86.5	250.0
	TSER100S	144.8	96.5	347.9	140.2	102.1	336.9	135.5	107.8	325.6	131.4	114.5	315.6
	TSER120S	165.5	103.1	397.7	167.0	116.9	401.3	160.6	122.5	386.0	154.9	129.1	372.3
	TSER20D	30.0	17.3	72.1	29.2	18.3	70.1	28.4	19.4	68.1	27.5	20.5	66.1
	TSER30D	38.6	23.0	92.8	40.2	27.0	96.6	41.3	31.1	99.3	39.8	32.5	95.7
	TSER40D	58.5	36.8	140.7	57.0	39.1	136.9	55.4	41.5	133.0	53.7	44.0	129.0
	TSER50D	73.2	49.1	175.8	70.6	51.0	169.7	68.1	53.2	163.7	65.9	56.0	158.3
	TSER60D	85.9	58.0	206.5	83.6	60.7	200.8	81.2	63.6	195.1	78.7	66.7	189.0
	TSER80D	111.3	74.9	267.4	108.1	78.3	259.8	105.2	82.6	252.7	102.3	87.3	245.9
	TSER100D	139.6	96.5	335.4	135.9	101.0	326.6	132.2	106.2	317.6	128.2	111.6	308.1
	TSER120D	181.9	122.4	437.1	176.7	128.4	424.5	171.4	134.8	411.9	165.9	141.6	398.7
	TSER160D	229.7	153.5	551.9	221.9	158.8	533.1	214.8	165.4	516.2	208.1	173.0	500.1
	TSER200D	289.6	193.2	695.8	280.4	204.4	673.8	271.1	215.9	651.3	262.7	229.1	631.3
	TSER240D	331.0	206.3	795.4	334.0	233.9	802.5	321.3	245.3	771.9	309.9	258.4	744.6
75°F	TSER10S	15.8	9.1	37.9	15.3	9.6	36.8	14.8	10.1	35.7	14.4	10.7	34.6
	TSER15S	18.3	9.6	44.1	19.3	11.4	46.5	20.2	13.5	48.4	20.7	15.6	49.7
	TSER20S	31.4	18.9	75.4	30.5	19.9	73.3	29.6	21.1	71.2	28.7	22.4	69.0
	TSER25S	37.7	23.8	90.7	38.2	26.8	91.7	36.7	27.7	88.2	35.3	28.8	84.9
	TSER30S	46.0	30.2	110.5	44.7	31.4	107.4	43.4	32.8	104.3	42.0	34.3	101.0
	TSER40S	59.9	38.7	144.0	58.1	40.4	139.6	56.3	42.3	135.4	54.7	44.6	131.5
	TSER50S	74.6	50.0	179.4	72.7	52.3	174.6	70.7	54.8	169.8	68.5	57.4	164.7
	TSER60S	97.3	63.3	233.9	94.5	66.3	227.1	91.6	69.4	220.2	88.6	72.8	213.0
	TSER80S	123.7	78.6	297.2	120.2	82.0	288.8	116.1	85.0	278.9	112.1	88.3	269.4
	TSER100S	156.1	99.1	375.1	150.9	104.7	362.5	145.5	110.2	349.6	140.6	116.6	337.8
	TSER120S	158.2	85.8	380.1	166.2	104.6	399.4	171.8	123.8	412.8	167.5	133.0	402.4
	TSER20D	32.4	17.4	77.8	31.5	18.4	75.7	30.6	19.4	73.5	29.7	20.6	71.3
	TSER30D	36.7	19.3	88.1	38.7	23.0	92.9	40.3	27.1	96.9	41.4	31.3	99.4
	TSER40D	62.7	37.7	150.7	61.0	39.9	146.7	59.2	42.3	142.3	57.5	45.0	138.1
	TSER50D	75.2	47.2	180.8	76.6	53.4	184.0	73.6	55.3	176.9	70.9	57.7	170.3
	TSER60D	91.9	60.3	220.9	89.4	62.9	214.8	86.8	65.8	208.6	84.1	68.8	202.0
	TSER80D	119.8	77.6	288.0	116.2	80.9	279.1	112.7	84.8	270.7	109.5	91.5	263.1
	TSER100D	149.3	100.1	358.7	145.3	104.6	349.2	141.3	109.7	339.6	137.1	115.1	329.4
	TSER120D	194.7	126.7	467.9	189.0	132.6	454.2	183.2	141.6	440.3	177.3	145.9	426.1
	TSER160D	247.3	157.3	594.3	240.3	164.0	577.6	232.1	170.0	557.8	224.3	181.2	538.9
	TSER200D	312.1	198.1	750.1	301.7	209.4	725.0	291.0	220.6	699.2	281.1	233.2	675.6
	TSER240D	316.3	171.7	760.1	332.4	209.3	798.7	343.6	247.7	825.7	334.9	266.0	804.9

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, R410A refrigerant, and operating at sea level.

[2]kW = Total compressor input power at rated voltage.

TSER Series Remote Air Cooled Condenser Chiller Cooling Capacities - 60 Hz (continued)

Leaving Coolant Temp	Model	Entering Condenser Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)	Cap[1]	Input kW[2]	Evap Flow (gpm)
80°F	TSER10S	16.9	9.1	40.6	16.5	9.7	39.6	16.0	10.2	38.5	15.5	10.8	37.3
	TSER15S	17.6	8.4	42.2	18.6	10.0	44.7	19.5	11.8	46.9	20.2	13.7	48.5
	TSER20S	33.4	19.2	80.4	32.7	20.5	78.5	31.8	21.8	76.4	30.8	23.1	74.1
	TSER25S	36.1	20.6	86.8	37.9	24.4	91.2	39.1	28.3	94.0	38.1	30.1	91.5
	TSER30S	49.1	31.5	118.1	47.8	32.8	114.9	46.3	34.2	111.3	44.7	35.6	107.4
	TSER40S	62.9	39.7	151.1	60.9	41.4	146.3	58.9	43.3	141.5	56.9	45.4	136.7
	TSER50S	77.9	51.4	187.2	75.6	53.6	181.7	73.3	56.0	176.1	70.7	58.4	170.0
	TSER60S	101.1	64.7	242.9	97.8	67.6	235.0	94.5	70.7	227.0	91.1	74.0	218.9
	TSER80S	122.2	73.9	293.7	124.7	83.0	299.6	120.1	85.9	288.6	115.6	89.2	277.9
	TSER100S	162.9	98.7	391.5	158.4	106.0	380.7	152.7	112.2	367.0	147.0	118.5	353.3
	TSER120S	153.2	76.4	368.2	161.8	93.6	388.9	168.6	112.1	405.1	173.2	131.2	416.2
	TSER20D	34.7	17.4	83.3	33.9	18.4	81.4	33.0	19.5	79.3	32.0	20.7	77.0
	TSER30D	35.1	16.8	84.4	37.2	20.0	89.5	39.0	23.6	93.8	40.3	27.4	96.9
	TSER40D	66.9	38.6	160.8	65.3	41.1	157.0	63.5	43.6	152.7	61.7	46.4	148.2
	TSER50D	71.9	40.9	172.9	75.6	48.3	181.8	78.1	56.1	187.7	76.3	59.9	183.5
	TSER60D	98.3	63.1	236.2	95.6	65.7	229.8	92.6	68.4	222.6	89.4	71.3	214.9
	TSER80D	125.7	79.4	302.2	121.7	82.8	292.6	117.8	86.7	283.1	113.8	90.9	273.4
	TSER100D	155.8	103.0	374.3	151.2	107.3	363.4	146.5	112.1	352.2	141.5	117.1	339.9
	TSER120D	202.1	129.5	485.7	195.6	135.3	470.0	188.9	141.4	454.0	182.2	148.0	437.9
	TSER160D	244.4	147.8	587.4	249.4	166.0	599.3	240.2	171.9	577.3	231.3	178.7	555.8
	TSER200D	325.8	197.5	782.9	316.8	212.1	761.5	305.4	224.5	734.0	294.0	237.2	706.6
	TSER240D	306.4	152.8	736.5	323.7	187.4	777.8	337.2	224.3	810.3	346.3	262.4	832.3

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F, a cooler fouling factor of 0.0001 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, R410A refrigerant, and operating at sea level.

[2]kW = Total compressor input power at rated voltage.

Application Considerations

When designing a chilled water system it is important all aspects of the system are considered to ensure stable and reliable operation. The following provides some general guidelines for designing a system.

Foundation

Install the unit on a rigid, non-warping mounting pad, concrete foundation, or level floor suitable to support the full operating weight of the equipment. When installed the equipment must be level within ¼ inch over its length and width.

Chiller Unit Location

Proper ventilation is an important consideration when locating the condenser. In general, locate the unit in an area that will not rise above 110°F.

To ensure proper airflow and clearance space for proper operation and maintenance allow a minimum of 36 inches of clearance between the sides of the equipment and any walls or obstructions. Avoid locating piping or conduit over the unit to ensure easy access with an overhead crane or lift to lift out heavier components during replacement or service. In addition, ensure the condenser and evaporator refrigerant pressure relief valves can vent in accordance with all local and national codes.

Air-cooled chillers use the surrounding air for cooling the condenser and require free passage of air in and out of the chiller and provision for remove of the warm air from the area.

Remote Air-Cooled Condenser Location

The remote air-cooled condenser is for outdoor use. Locate the remote condenser in an accessible area. The vertical air discharge must be unobstructed. Allow a minimum of 48 inches of clearance between the sides and ends of the condenser and any walls or obstructions. For installations with multiple condensers, allow a minimum of 96 inches between condensers placed side-by-side or 48 inches for condensers placed end-to-end.

When locating the condenser it is important to consider accessibility to the components to allow for proper maintenance and servicing of the unit. Avoid locating piping or conduit over the unit to ensure easy access with an overhead crane or lift to lift out heavier components during replacement or service.

Avoid areas that can create a “micro-climate” such as an alcove with east, north, and west walls that can be significantly warmer than surrounding areas. The condenser needs to have unrestricted airways so it can easily move cool air in and heated air away. Consider locating the condenser where fan noise and vibration transmission into nearby workspaces is unlikely.

Process Fluid Piping

Proper insulation of chilled process fluid piping is crucial to prevent condensation. The formation of condensation adds a substantial heat load to the chiller.

The importance of properly sized piping cannot be overemphasized. See the ASHRAE Handbook or other suitable design guide for proper pipe sizing. In general, run full size piping out to the process and reduce pipe size at connections as needed. One of the most common causes of unsatisfactory chiller performance is poor piping system design. Avoid long lengths of hoses, quick disconnect fittings, and manifolds wherever possible as they offer high resistance to water flow. When manifolds are required, install them as close to the use point as possible. Provide flow-balancing valves at each machine to assure adequate water distribution in the entire system.

Process Fluid Temperature

The chiller can operate with a variety of different supply and return temperatures. The chiller is able to start and pull down with short-term entering fluid temperatures up to 20°F warmer than the maximum set point of the chiller. This allows the chiller to pull down the temperature of a reservoir or process fluid loop on start-up. Under normal operation, the entering water temperature should not exceed 10°F warmer than the maximum set point temperature of the chiller.

Process Fluid Flow Rate

The nominal performance of the chiller is for a temperature rise of 10°F through the process. The chiller is capable of operating with different

operating temperature differentials; however, careful consideration of flow limitations, correction to capacity, pressure drops, and other operating parameters is required when selecting the proper unit for the application. The minimum flow rate to prevent fouling and to ensure the chiller stays within normal refrigerant operating conditions is approximately 1.2 gpm per nominal ton of cooling capacity. The fouling factor used to calculate the ratings of the vessels are 0.00010 Ft^2 • Hr • °F/Btu.

If the process flow requirement is less than 1.2 gpm per nominal ton of cooling capacity use a primary pumping loop for the lower flow at a higher temperature rise and a secondary pumping loop for a higher flow and lower temperature drop through the chiller. If a secondary pumping loop is used, the mixed temperature of coolant entering the evaporator must be a minimum of 5°F above the design set point of the chiller.

The maximum flow limitation is determined based upon a 5°F drop through the chiller at the maximum capacity of the chiller; however, the flows often times result in impractical pressure drops through the chiller and are therefore not likely for system design. If the process flow requirement is higher than the maximum flow limitation use a bypass around the chiller or a primary pumping loop designed for the high flow at a lower temperature rise and a secondary pumping loop for a lower flow and high temperature drop through the chiller. If a secondary pumping loop is used, the mixed temperature of coolant entering the chiller must be a minimum 5°F above the design set point of the chiller.

The use of varying chiller flows is sometimes necessary; however, a dedicated evaporator circulation pump provides increased system stability. If the flow through the chiller is varied, the minimum fluid loop volume must be in excess of 3 gallons of coolant per ton of cooling and the flow rate must change at a rate of no greater than 10% per minute in order to maintain an acceptable level of temperature control. If the chiller sees a net rate of change greater than 10% per minute it may result in temporary supply temperature fluctuations greater than 1°F.

Condenser Water Temperature and Flow

All water-cooled condenser chillers include a factory mounted condenser water-regulating valve to regulate the flow of condenser water to maintain the proper refrigerant pressures. The minimum flow rate is approximately 0.5 gpm per nominal cooling ton to prevent fouling and to ensure the chiller stays within normal refrigerant operating conditions. The fouling factor used to calculate the ratings of the vessels are 0.00025 Ft^2 • Hr • °F/Btu.

The chiller will start and operate with an inlet water temperature between 55°F and 95°F. The actual flow requirements will vary. Lowering the condenser water supply temperature below 85°F is an effective way to reduce the overall cooling system input power requirements.

Condenser Air Temperature

All remote air-cooled condenser chillers come with a factory selected remote air-cooled condenser to meet the needs of the chiller module to which it is connected. The chiller can start and operate with an inlet air temperature between -20°F and 100°F. The minimum ambient air temperature at which the chiller will start is -20°F based on still air.

System Fluid Chemistry Requirements

The properties of water make it ideal for heat transfer applications. It is safe, non-flammable, non-poisonous, easy to handle, widely available, and inexpensive in most industrialized areas.

When using water as a heat transfer fluid it is important to keep it within certain chemistry limits to avoid unwanted side effects. Water is a “universal solvent” because it can dissolve many solid substances and absorb gases. As a result, water can cause the corrosion of metals used in a cooling system. Often water is in an open system (exposed to air) and when the water evaporates, the dissolved minerals remain in the process fluid. When the concentration exceeds the solubility of some minerals, scale forms. The life giving properties of water can also encourage biological growth that can foul heat transfer surfaces.

To avoid the unwanted side effects associated with water cooling, proper chemical treatment and preventive maintenance is required for continuous plant productivity.

Unwanted Side Effects of Improper Water Quality

- Corrosion
- Scale
- Fouling
- Biological Contamination

Cooling Water Chemistry Properties

- Electrical Conductivity
- pH
- Alkalinity
- Total Hardness
- Dissolved gases

Chillers at their simplest have two main heat exchangers: one that absorbs the heat from the process (evaporator) and one that removes the heat from the chiller (condenser). All our chillers use stainless steel brazed plate evaporators. Our air-cooled chillers use air to remove heat from the chiller; however, our water-cooled chillers use either a tube-in-tube or shell-in-tube condenser which has copper refrigerant tubes and a steel shell. These, as are all heat exchangers, are susceptible to fouling of heat transfer surfaces due to scale or debris. Fouling of these surfaces reduces the heat-transfer surface area while increasing the fluid velocities and pressure drop through the heat exchanger. All of these effects reduce the heat transfer and affect the efficiency of the chiller.

The complex nature of water chemistry requires a specialist to evaluate and implement appropriate sensing, measurement and treatment needed for satisfactory performance and life. The recommendations of the specialist may include filtration, monitoring, treatment and control devices. With the ever-changing regulations on water usage and treatment chemicals, the information is usually up-to-date when a specialist in the industry is involved.

Fill Water Chemistry Requirements

Water Characteristic	Quality Limitation
Alkalinity (HCO3-)	70-300 ppm
Aluminum (Al)	Less than 0.2 ppm
Ammonium (NH3)	Less than 2 ppm
Chlorides (Cl-)	Less than 300 ppm
Electrical Conductivity	10-500µS/cm
Free (aggressive) Carbon Dioxide (CO2)†	Less than 5 ppm
Free Chlorine(Cl2)	Less than 1 PPM
HCO3-/SO42-	Greater than 1.0
Hydrogen Sulfide (H2S)	Less than 0.05 ppm
Iron (Fe)	Less than 0.2 ppm
Manganese (Mn)	Less than 0.1 ppm
Nitrate (NO3)	Less than 100 ppm
pH	7.5-9.0
Sulfate (SO42-)	Less than 70 ppm
Total Hardness (dH)k	4.0-8.5

† Dissolved carbon dioxide calculation is from the pH and total alkalinity values shown below or measured on the site using a test kit. Dissolved Carbon Dioxide, PPM = TA x $2^{[(6.3-pH)/0.3]}$ where TA = Total Alkalinity, PPM as $CaCO_3$

Recommended Glycol Solutions

Chilled Water Temperature	Percent Glycol By Volume
50°F (10°C)	Not required
45°F (7.2°C)	5 %
40°F (4.4°C)	10 %
35°F (1.7°C)	15 %
30°F (-1.1°C)	20 %
25°F (-3.9°C)	25 %
20°F (-6.7°C)	30 %

CAUTION: When your application requires the use of glycol, use industrial grade glycol specifically designed for heat transfer systems and equipment. Never use glycol designed for automotive applications. Automotive glycols typically have additives engineered to benefit the materials and conditions found in an automotive engine; however, these additives can gel and foul heat exchange surfaces and result in loss of performance or even failure of the chiller. In addition, these additives can react with the materials of the pump shaft seals resulting in leaks or premature pump failures.

WARNING: Ethylene Glycol is flammable at higher temperatures in a vapor state. Carefully handle this material and keep away from open flames or other possible ignition sources.

Over-Sizing Chillers

Over-sizing chillers for future growth is sometimes necessary. While this practice may be necessary, it is highly recommended that chillers be no more than 15% larger than design conditions to avoid unwanted reductions in system efficiency and excessive electrical power use and/or compressor cycling due to reduced chiller loading. If the system design requires prolonged operation at reduced loads considering using two smaller chillers as operating smaller chillers at higher loads is preferred to operating one larger chiller at or near its minimum load capacity.

Strainers

Each evaporator has a 20-mesh inlet strainer to protect the evaporator. All water-cooled condensers require filtering with a minimum of a 20-mesh filtering system to protect the condenser from contamination.

Remote Condenser Selection

Chillers using remote air-cooled condensers include a properly sized and selected remote condenser so there is no need for a separate remote condenser selection. For installation and line size guidelines please referrer to the Installation and Operation manual of the chiller.

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