THERMAL CARE

Product Catalog

MX Series Rotary Screw Chillers

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Features

Since 1969, Thermal Care has manufactured industrial cooling equipment using the best available component technologies for a portable chiller that provides long lasting and dependable performance. We manufacture all our MX Series chillers in our ISO 9001:2008 certified facility.

Easy to Install

Compact and easy to maneuver into position with everything factory wired and piped ready for simple field connections our chillers are easy to install.

Rugged, Compact Design

With components neatly arranged on a heavy-duty galvanized steel frame, our chillers maintain a balance between minimized floor space and easy access.

Electrical Components Mounted and Wired

All electrical components and sensors mounted and wired at the factory to reduce installation labor, time, and material costs ensure the chiller is up and running quickly.

Flexible Piping Arrangement

Common inlet and outlet centerline dimensions throughout the entire product line allow for easy installation and expansion of the system with a common horizontal manifold.

Reliable

The use of the best available components and control software combined with our extensive experience in providing industrial cooling equipment ensures our chillers provide outstanding reliability.

Direct-Drive Rotary Screw Compressor

The direct drive rotary screw compressor with its rugged design and proven longevity in industrial cooling applications provides outstanding reliability and low-maintenance operation.

Stainless Steel Evaporators

Stainless steel plate copper brazed evaporators provide maximum performance, long life, and a level of corrosion protection not available in conventional steel shell and copper tube evaporators.

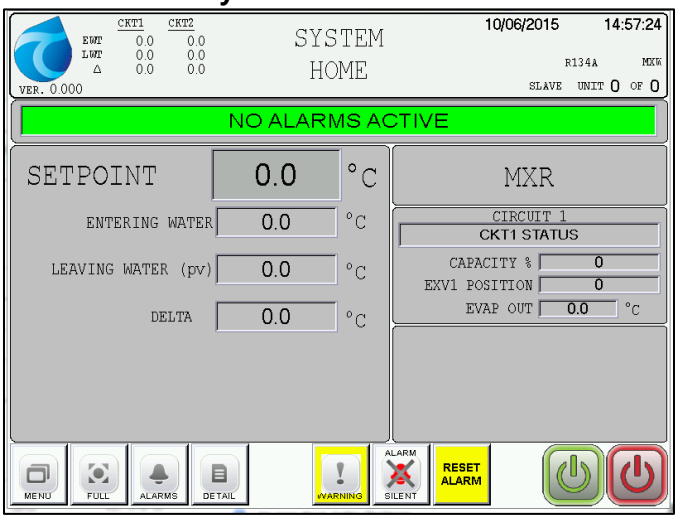
Evaporator Inlet Strainer

An evaporator inlet strainer provides a built-in filtration system to keep debris in the process fluid from causing costly downtime and repair due to a clogged chiller evaporator.

Powerful PLC Control System

Our PLC control system provides an excellent combination of provide hardware and a powerful software control system for outstanding performance that is reliable and easy to use.

System Home Screen



Color Touch-Screen Display

The high-resolution, full-color (65,000 colors), high-speed LCD touch-screen interface provides clear English text display of the chiller operation for quick and easy monitoring and control of the system.

Expandable Multiple Chiller Control

Capable of controlling up to six chillers in a common chilled water system allows for easy expansion and flexible design capabilities for systems with over 600 tons of chilling capacity.

Compressor Protection Technology

Our compressor protection technology provides start-to-start anti-recycle compressor control logic that limits compressor cycling under low-loads to extend compressor life.

Automatic Compressor Sequencing

The control system records and displays individual compressor running hours and automatically distributes run time among all compressors in the system.

Industrial Control Panel

Built for heavy-duty industrial operation we use a NEMA-12 control panel, high quality components, and 24 VDC control circuit power to provide safe, consistent, and reliable operation.

C-UL508A Industrial Control Panel

Our chiller includes C-UL 508A industrial control panel construction using high quality components for heavy-duty industrial production applications to provide safe and dependable operation.

High-Quality 24 VDC Power Supply

The 24-volt DC power supply provides dependable control circuit power and isolates the control circuit from static interference to ensure stable and precise operation.

Warranty and Start-up

12 months parts
12 months labor
One-day factory authorized start-up supervision

Available Options

In most situations, our standard chiller configuration is sufficient; however, there are applications where there is a need for additional features. For those applications, we have a number of available options to enhance the flexibility of our MX Series chillers.

Rotary Non-Fused Disconnect Switch

This option adds a 5 kA SCCR (Short Circuit Current Rating) rotary non-fused disconnect switch to the control panel sized for the power rating of the chiller (and pumps if the chiller is purchased with the reservoir option) to allow for safely locking-out the main power while servicing the chiller.

ModBUS RTU Communications Port

This option is available where there is a need to communicate with an external monitoring or control system using ModBUS RTU. This option provides a RS-485 connector on the PLC that is located inside the control cabinet. The chiller can operate with only one communications protocol so this option is not available with any other communications port options.

BACnet Communications Port

For applications where there is a need to communicate with an external monitoring or control system using BACnet communications a BACnet communications port is available. This option adds a ModBUS expansion cassette to the PLC, a ModBUS to BACnet gateway, as well as a RS-485 connector. The chiller can operate with only one communications protocol so this option is not available with any other communications port options.

LonWorks Communications Port

For applications where there is a need to communicate with an external monitoring or control system using Lon Works communications a LonWorks communications port is available. This option adds a ModBUS expansion cassette to the PLC, a ModBUS to LonWorks gateway, as well as a RS-485 connector. The chiller can operate with only one communications protocol so this option is not available with any other communications port options.

5 year Compressor Parts Warranty

This option extends the standard 12-month compressor parts warranty to 60 months for those applications where there is a need for an added level of compressor parts warranty coverage.

General Data

Table 1 – Water Cooled Chiller General Data (60 Hz)

	MXW50	MXW75	MXW100	MXW125
General				
Cooling Capacity (tons)[1]	53.4	70.2	101.1	123.1
Set Point Range (°F)	20 to 75	20 to 75	20 to 75	20 to 75
Process Fluid In/Out (in)	3	4	4	4
Condenser Water In/Out (in)	3	4	4	4
Refrigerant Charge (lbs of R134a)	75	105	140	175
Minimum Unloaded Capacity (ton)	18.0	28.0	34.0	42.0
Dimensions, Weights, Amps				
Length (in)	140	142	147	148
Width (in)	36	36	36	36
Height (in)	81	81	81	81
Shipping Weight (lbs)	2,965	3,915	4,315	5,020
Operating Weight (lbs)	3,145	4,095	4,575	5,330
MCA @ 460/3/60 (amps)[2]	142	173	209	275

[1]Cooling capacity when cooling water with 50°F set point, 60°F return, 85°F condenser water, R-134a refrigerant.
[2]MCA is Minimum Circuit Amps (for wire sizing), complies with NEC, Section 430-24.

Table 2 – Remote Air-Cooled Condenser Chiller General Data (60 Hz)

	MXR50	MXR75	MXR100	MXR125
General				
Cooling Capacity (tons)[1]	49.0	65.4	93.3	113.9
Set Point Range (°F)	20 to 75	20 to 75	20 to 75	20 to 75
Process Fluid In/Out (in)	3	4	4	4
Liquid Line Connection (in)	1 3/8	1 5/8	2 1/8	2 1/8
Discharge Line Connection (in)	2 1/8	2 5/8	2 5/8	3 1/8
Refrigerant Charge (lbs of R134a)	Varies based on system refrigerant piping			
Minimum Unloaded Capacity (ton)	18.0	28.0	34.0	42.0
Dimensions, Weights, Amps				
Length (in)	134	137	137	137
Width (in)	36	36	36	36
Height (in)	81	81	81	81
Shipping Weight (lbs)	2,495	3,340	3,485	3,700
Operating Weight (lbs)	2,620	3,510	3,710	3,980
MCA @ 460/3/60 (amps)[2]	142	173	209	275

[1]Cooling capacity when cooling water with 50°F set point, 60°F return, 95°F condenser air, R-134a refrigerant.
[2]MCA is Minimum Circuit Amps (for wire sizing), complies with NEC, Section 430-24.

Table 3 - Remote Condensers General Data (60 Hz)

	LAVF-14412	LAVF-16410	LAVF-24410	LEVF-26410
Nominal Capacity (ton)	50	75	90	140
Quantity Required	1 for MXR50	1 for MXR75	1 for MXR100	1 for MXR125
Refrigerant Charge (lbs)	Varies based on system refrigerant piping			
Number of Fans	4	6	8 (2 rows of 4 fans)	12 (2 rows of 6 fans)
Refrigerant Inlet Line (in)	3⅛	3⅛	3⅛ per row of fans	3⅛ per row of fans
Refrigerant Outlet Line (in)	3⅛	3⅛	3⅛	3⅛
Length (in)	220	328	220	342
Width (in)	45	45	91	91
Height (in)	61	61	61	61
Shipping Weight (lbs)	1,600	2,810	2,851	5,218
Operating Weight (lbs)	Varies based on system refrigerant charge and operating conditions			
Unit MCA @ 460/3/60[1]	14	22	29	43

[1]MCA is Minimum Circuit Amps (for wire sizing) as provided by the remote condenser manufacturer.

Table 4 – Chiller Electrical Data (60 Hz)

Model	Rated Voltage	Allowable Supply		Number of Power Connections	Number of Conductors	Compressor Data		Unit Data	
		Min	Max			RLA[1]	LRA[2]	MCA[3]	MOPD[4]
MXW50	460/3/60	414	506	1	3	112	267	142	250
	575/3/60	518	632	1	3	90	212	114	200
MXW75	460/3/60	414	506	1	3	137	433	173	300
	575/3/60	518	632	1	3	109	346	138	225
MXW100	460/3/60	414	506	1	3	166	563	209	350
	575/3/60	518	632	1	3	133	449	168	300
MXW125	460/3/60	414	506	1	3	219	716	275	450
	575/3/60	518	632	1	3	175	577	220	350
MXR50	460/3/60	414	506	1	3	112	267	142	250
	575/3/60	518	632	1	3	90	212	114	200
MXR75	460/3/60	414	506	1	3	137	433	173	300
	575/3/60	518	632	1	3	109	346	138	225
MXR100	460/3/60	414	506	1	3	166	563	209	350
	575/3/60	518	632	1	3	133	449	168	300
MXR125	460/3/60	414	506	1	3	219	716	275	450
	575/3/60	518	632	1	3	175	577	220	350

[1]RLA is Rated Load Amps.
[2]LRA is Locked Rotor Amps.
[3]MCA is Minimum Circuit Amps (for wire sizing), complies with NEC, Section 430-24.
[4]MOPD is Maximum Over-current Protection Device, complies with NEC, Section 430-53.

Table 5 – Remote Air-Cooled Condenser Electrical Data (60 Hz)

Model	Rated Voltage[1]	Allowable Supply		Number of Power Connections	Number of Conductors	Fan Data		Unit Data	
		Min	Max			Qty	RLA[2] Ea	MCA[3]	MOPD[4]
LAVF-14412	460/3/60	414	506	1	3	4	3.5	15	20
LEVF-16410	460/3/60	414	506	1	3	6	3.5	22	30
LAVF-24410	460/3/60	414	506	1	3	8	3.5	29	35
LAVF-25410	460/3/60	414	506	1	3	10	3.5	36	45

Notes:
[1]575/3/60 remote condensers require special selection and pricing. Consult factory for details.
[2]RLA is Rated Load Amps
[3]MCA is Minimum Circuit Amps (for wire sizing) as provided by the remote condenser manufacturer.
[4]MOCP is Maximum Over-current Protection Device as provided by the remote condenser manufacturer.

Performance Data

Table 6 – MXW Series 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]	Cooler Flow (gpm)	Cap[1]	Input kW[2]	Cooler Flow (gpm)	Cap[1]	Input kW[2]	Cooler Flow (gpm)	Cap[1]	Input kW[2]	Cooler Flow (gpm)
20°F	MXW50	27.9	31.6	77.7	26.9	33.4	75.1	25.9	35.4	72.3	24.9	37.6	69.4
	MXW75	37.4	45.4	104.4	36.2	48.0	101.0	34.9	50.8	97.5	33.6	52.2	93.8
	MXW100	54.0	57.5	150.6	52.2	60.7	145.7	50.4	64.3	140.6	48.5	68.2	135.3
	MXW125	66.0	75.4	184.0	63.8	77.4	178.1	61.7	84.5	172.0	59.4	87.1	165.7
25°F	MXW50	31.5	32.2	85.4	30.5	34.1	82.6	29.4	36.1	79.6	28.2	38.2	76.6
	MXW75	42.1	44.7	114.1	40.8	47.2	110.6	39.5	50.1	107.0	38.1	53.1	103.2
	MXW100	60.7	58.5	164.5	58.8	61.8	159.5	56.8	65.3	154.1	54.8	69.3	148.6
	MXW125	74.2	74.5	201.1	71.9	78.8	194.9	69.5	83.4	188.5	67.1	88.5	181.9
30°F	MXW50	35.5	33.0	93.6	34.3	34.7	90.6	33.1	36.7	87.5	31.9	39.0	84.2
	MXW75	47.2	45.5	124.5	45.8	48.1	120.8	44.4	50.9	117.1	42.9	54.0	113.2
	MXW100	68.0	59.7	179.4	66.0	63.0	174.1	63.9	66.7	168.6	61.7	70.7	162.7
	MXW125	83.0	75.9	219.2	80.6	80.3	212.7	78.0	84.9	206.0	75.4	90.0	199.0
35°F	MXW50	39.8	33.7	102.3	38.5	35.5	99.1	37.3	37.6	95.8	35.9	39.8	92.4
	MXW75	52.7	46.5	135.5	51.2	49.0	131.7	49.7	51.9	127.8	48.1	55.0	123.7
	MXW100	75.9	61.0	195.3	73.7	64.3	189.7	71.5	68.0	183.9	69.1	72.0	177.8
	MXW125	92.7	77.6	238.4	90.0	81.9	231.6	87.3	86.7	224.5	84.4	91.7	217.2
40°F	MXW50	44.4	34.5	111.6	43.1	36.4	108.2	41.7	38.4	104.7	40.3	40.7	101.1
	MXW75	58.6	47.5	147.2	57.0	50.1	143.2	55.4	52.9	139.2	53.7	56.0	134.9
	MXW100	84.5	62.5	212.1	82.2	65.9	206.3	79.7	69.5	200.2	77.2	73.6	193.7
	MXW125	103.1	79.4	258.9	100.2	83.7	251.6	97.2	88.4	244.2	94.2	93.7	236.5
45°F	MXW50	49.6	35.5	118.9	48.1	37.3	115.5	46.6	39.4	111.8	45.0	41.6	108.1
	MXW75	65.2	48.7	156.4	63.5	51.3	152.3	61.8	54.2	148.2	60.0	57.3	143.8
	MXW100	93.9	64.1	225.3	91.4	67.5	219.4	88.8	71.2	213.0	86.0	75.2	206.3
	MXW125	114.6	81.5	274.8	111.5	85.9	267.4	108.2	90.5	259.7	104.9	95.7	251.7
50°F	MXW50	54.9	36.4	131.8	53.4	38.4	128.1	51.8	40.5	124.2	50.1	42.7	120.1
	MXW75	72.0	50.0	172.7	70.2	52.6	168.4	68.3	55.4	163.9	66.4	58.5	159.3
	MXW100	103.8	65.9	249.1	101.1	69.2	242.7	98.3	72.9	235.9	95.3	76.9	228.7
	MXW125	126.4	83.6	303.5	123.1	88.0	295.5	119.7	92.7	287.2	116.1	97.9	278.6
55°F	MXW50	60.7	37.6	145.8	59.0	39.5	141.7	57.3	41.6	137.5	55.4	43.8	133.1
	MXW75	79.2	51.3	190.2	77.3	53.9	185.6	75.3	56.7	180.9	73.3	59.9	176.0
	MXW100	114.4	67.7	274.7	111.5	71.1	267.8	108.5	74.8	260.4	105.2	78.7	252.7
	MXW125	139.2	85.9	334.2	135.6	90.2	325.6	131.9	95.0	316.7	128.1	100.1	307.5
60°F	MXW50	66.9	38.8	160.7	65.1	40.8	156.4	63.2	42.8	151.8	61.2	45.0	147.1
	MXW75	86.9	52.6	208.7	85.0	55.3	204.1	82.9	58.2	199.1	80.7	61.3	193.8
	MXW100	125.8	69.7	302.2	122.7	73.0	294.7	119.4	76.7	286.8	115.9	80.7	278.4
	MXW125	152.7	88.3	366.7	149.0	92.7	357.9	145.1	97.4	348.4	140.9	102.5	338.5
65°F	MXW50	73.6	40.3	176.9	71.7	42.2	172.3	69.7	45.3	167.5	67.6	47.7	162.5
	MXW75	95.1	54.1	228.4	92.9	56.6	223.1	90.9	59.6	218.4	88.6	62.7	212.9
	MXW100	138.0	71.8	331.6	134.7	75.1	323.6	131.1	78.7	315.1	127.4	82.7	306.1
	MXW125	167.1	90.7	401.4	162.9	94.9	391.4	159.1	99.9	382.1	154.7	105.1	371.7
70°F	MXW50	74.8	40.5	179.7	72.5	42.4	174.2	70.1	44.4	168.4	67.6	46.5	162.4
	MXW75	104.0	55.7	249.8	101.9	58.4	244.8	99.3	61.0	238.6	96.9	64.1	232.8
	MXW100	150.6	73.7	362.0	147.5	77.3	354.3	143.7	80.9	345.3	139.7	84.9	335.6
	MXW125	179.6	91.5	431.6	178.7	97.9	429.4	173.8	102.4	417.5	169.1	107.5	406.4
75°F	MXW50	74.7	40.8	179.6	72.4	42.4	174.1	70.0	44.4	168.3	67.6	46.6	162.4
	MXW75	99.4	48.8	238.9	106.0	56.6	254.6	109.0	63.0	262.0	106.0	65.8	254.7
	MXW100	165.2	76.4	397.1	160.9	79.4	386.6	156.9	83.0	377.0	152.6	87.0	366.7
	MXW125	171.2	80.2	411.5	183.1	93.3	439.9	190.7	105.8	458.3	185.0	110.4	444.5

[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, condenser fouling factor of 0.00025 ft^2 • hr • °F/Btu, the use of an appropriate ethylene glycol solution where needed, and R134a refrigerant.

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

Table 7 – MXR Series 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]	Cooler Flow (gpm)	Cap[1]	Input kW[2]	Cooler Flow (gpm)	Cap[1]	Input kW[2]	Cooler Flow (gpm)	Cap[1]	Input kW[2]	Cooler Flow (gpm)
20°F	MXR50	27.4	32.4	76.5	26.5	34.3	73.8	25.5	36.2	71.1	24.5	38.4	68.4
	MXR75	36.9	46.5	102.9	35.7	49.1	99.6	34.5	52.0	96.2	33.3	55.2	92.8
	MXR100	53.1	59.0	148.2	51.4	62.3	143.3	49.6	65.9	138.3	47.8	69.9	133.2
	MXR125	65.0	77.4	181.2	62.9	81.7	175.4	60.7	84.0	169.4	58.6	91.6	163.5
25°F	MXR50	30.8	33.3	83.6	29.8	35.2	80.8	28.7	37.2	77.9	27.6	39.4	74.9
	MXR75	41.3	46.0	112.1	40.0	48.6	108.6	38.7	51.4	105.0	37.4	54.6	101.4
	MXR100	59.5	60.6	161.2	57.6	64.0	156.1	55.6	67.6	150.9	53.6	71.6	145.5
	MXR125	72.7	77.1	197.1	70.4	81.4	191.0	68.1	86.2	184.7	65.7	91.3	178.2
30°F	MXR50	34.5	34.4	91.1	33.4	36.3	88.2	32.2	38.3	85.1	31.0	40.6	81.9
	MXR75	46.1	47.3	121.7	44.7	49.9	118.1	43.3	52.9	114.4	41.9	56.1	110.5
	MXR100	66.3	62.4	175.0	64.3	65.9	169.6	62.2	69.7	164.1	60.0	73.8	158.3
	MXR125	81.0	79.3	213.9	78.6	83.9	207.4	76.0	88.6	200.7	73.4	93.8	193.8
35°F	MXR50	38.5	35.5	99.1	37.3	37.5	95.9	36.0	39.6	92.6	34.7	41.9	89.3
	MXR75	51.3	48.8	131.9	49.8	51.5	128.1	48.3	54.5	124.2	46.7	57.7	120.2
	MXR100	73.7	64.5	189.5	71.5	68.0	183.9	69.2	71.9	178.0	66.8	76.0	171.8
	MXR125	90.0	81.9	231.5	87.3	86.4	224.7	84.6	91.4	217.6	81.8	96.8	210.3
40°F	MXR50	42.8	36.8	107.4	41.4	38.8	104.1	40.0	40.9	100.5	38.6	43.3	97.0
	MXR75	56.8	50.4	142.7	55.2	53.2	138.7	53.6	56.2	134.6	51.9	59.5	130.3
	MXR100	81.6	66.7	204.8	79.2	70.3	198.8	76.7	74.2	192.6	74.1	78.5	186.1
	MXR125	99.6	84.7	250.1	96.7	89.3	242.8	93.7	94.3	235.3	90.7	99.9	227.7
45°F	MXR50	47.5	38.3	113.8	46.0	40.3	110.3	44.4	42.4	106.6	42.9	44.9	102.9
	MXR75	62.9	52.3	150.9	61.2	55.1	146.8	59.4	58.2	142.5	57.6	61.5	138.2
	MXR100	90.2	69.2	216.4	87.6	72.9	210.1	84.9	76.9	203.6	82.0	81.1	196.8
	MXR125	110.1	87.8	264.1	106.9	92.5	256.5	103.7	97.7	248.7	100.4	103.3	240.8
50°F	MXR50	52.3	39.8	125.4	50.6	41.8	121.6	49.0	44.1	117.6	47.3	46.5	113.5
	MXR75	69.1	54.2	165.9	67.3	57.1	161.5	65.4	60.2	156.9	63.4	63.6	152.2
	MXR100	99.1	71.8	237.8	96.2	75.5	231.0	93.3	79.7	223.9	90.2	84.0	216.5
	MXR125	120.8	91.1	289.9	117.4	95.9	281.8	113.9	101.1	273.4	110.3	106.8	264.8
55°F	MXR50	57.4	41.5	137.7	55.6	43.5	133.5	53.8	45.8	129.2	52.0	48.3	124.8
	MXR75	75.7	56.2	181.8	73.7	59.1	177.1	71.7	62.4	172.2	69.6	65.8	167.2
	MXR100	108.5	74.6	260.6	105.4	78.4	253.2	102.2	82.6	245.4	98.9	87.1	237.5
	MXR125	132.2	94.6	317.4	128.5	99.4	308.6	124.8	104.9	299.6	120.9	110.6	290.3
60°F	MXR50	62.8	43.3	150.8	60.9	45.5	146.2	58.9	47.7	141.6	56.9	50.2	136.8
	MXR75	82.5	58.2	198.2	80.6	61.4	193.6	78.5	64.8	188.4	76.2	68.3	183.1
	MXR100	118.5	77.7	284.7	115.2	81.6	276.6	111.7	85.8	268.2	108.1	90.4	259.6
	MXR125	143.9	98.0	345.6	140.3	103.3	337.1	136.3	108.8	327.3	132.1	114.7	317.3
65°F	MXR50	68.7	46.7	165.1	66.6	48.9	160.0	64.2	49.9	154.2	61.7	52.3	148.3
	MXR75	89.3	59.9	214.5	87.4	63.3	210.0	85.4	67.0	205.3	83.2	70.9	199.8
	MXR100	129.1	81.0	310.1	125.4	84.9	301.3	121.7	89.3	292.3	117.8	93.9	282.9
	MXR125	155.7	101.1	374.1	152.0	106.7	365.0	148.2	112.8	356.1	144.0	119.1	345.8
70°F	MXR50	68.7	45.5	165.1	66.4	47.6	159.5	64.0	49.8	153.7	61.5	52.1	147.9
	MXR75	97.2	62.5	233.6	94.8	65.6	227.7	92.3	68.9	221.8	90.1	73.0	216.6
	MXR100	139.5	83.8	335.2	136.2	88.4	327.2	132.2	92.9	317.5	128.0	97.6	307.5
	MXR125	169.2	105.4	406.6	164.6	110.5	395.5	160.0	116.2	384.3	155.8	122.9	374.3
75°F	MXR50	68.7	45.6	165.0	66.3	47.6	159.4	63.9	49.9	153.7	61.5	52.3	147.8
	MXR75	106.5	66.2	255.9	103.1	68.5	247.9	100.3	71.8	240.9	97.5	75.5	234.3
	MXR100	150.4	86.7	361.4	146.5	91.1	352.1	142.8	96.2	343.2	138.4	101.2	332.6
	MXR125	184.8	111.4	444.2	178.9	115.7	430.0	173.5	121.0	416.9	168.3	127.1	404.4

[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, R134a refrigerant, and operating at sea level. For higher elevations, reduce capacity by applying the following capacity factors for elevations above sea level: 1,000 feet elevation = 0.98, 2,000 feet elevation = 0.95, 3,000 feet elevation = 0.93, 4,000 feet elevation = 0.91, 5,000 feet elevation = 0.89, 6,000 feet elevation = 0.87, 7,000 feet elevation = 0.85. 8,000 feet elevation = 0.81, more than 8,000 feet elevation consult factory.

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

Coolant and Condenser Pressure Drop

Figure 1 – Chiller Coolant Pressure Drop

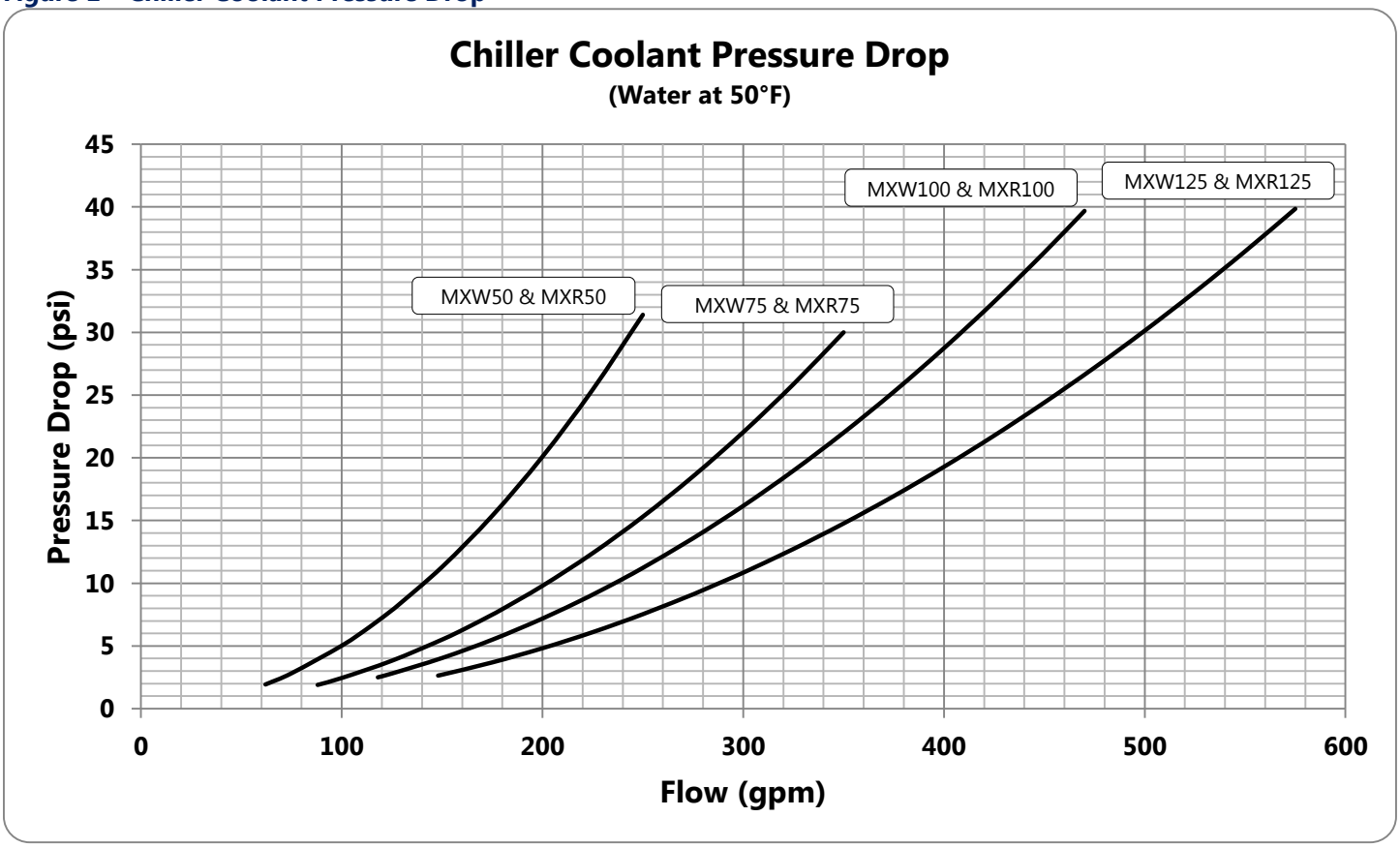
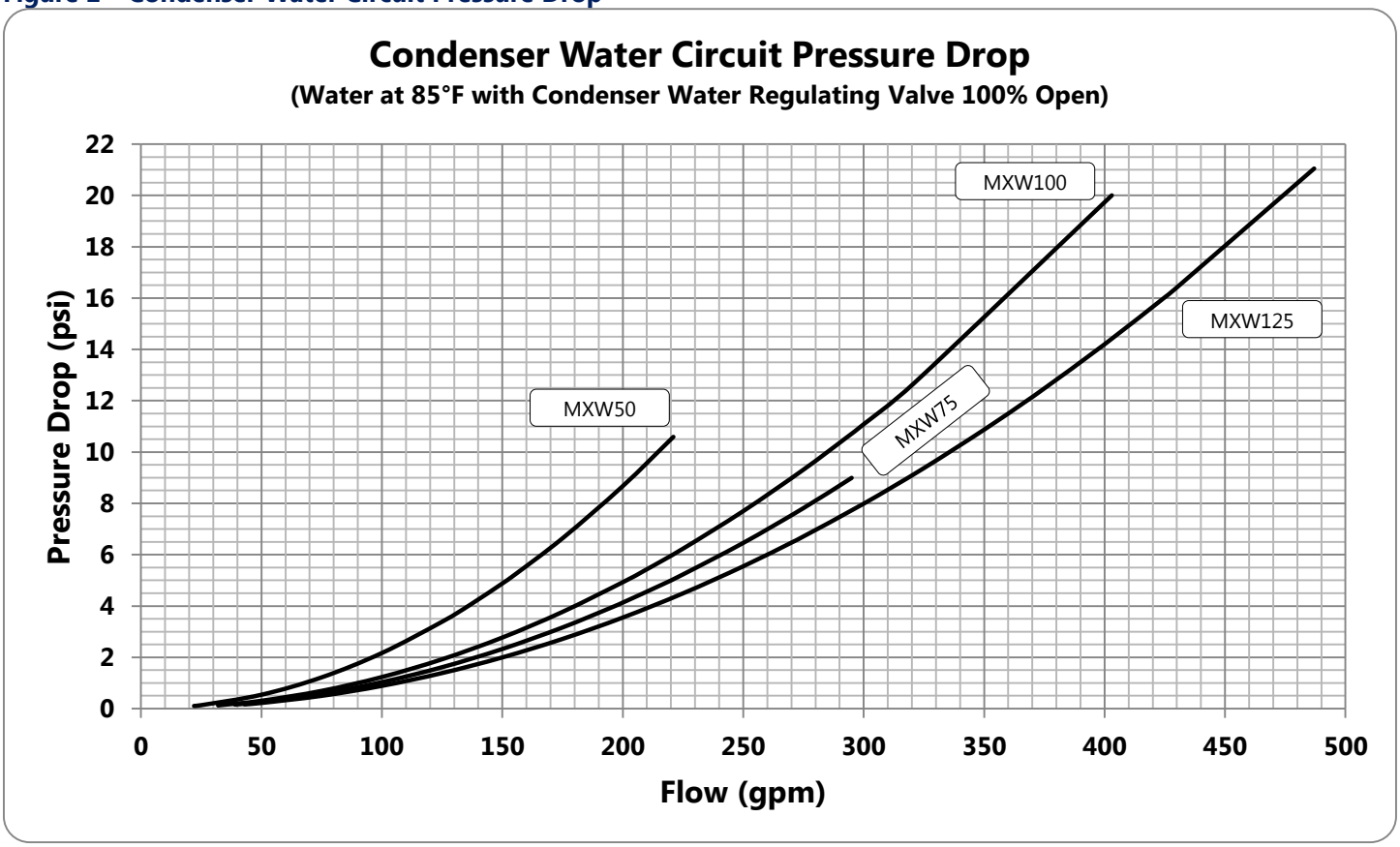


Figure 2 – Condenser Water Circuit Pressure Drop



Application Considerations

The following sections describe various application topics that are important for many industrial cooling system designs. As is the case with all chilled water system designs, we recommend care be taken to ensure all aspects of the system operating extremes are reviewed and accounted for. If your application is outside the application considerations shown in this section, contact your local sales representative for assistance.

Unit Location

The chiller is for indoor installation in an area where the temperature is between 60°F and 110°F on rigid, non-warping mounting pads or a concrete foundation 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.

Serviceability is an important factor to consider when deciding on the location of the chiller. Do not compromise this feature by locating the chiller in an inaccessible area. When locating the chiller it is important to consider accessibility to the components to allow for proper maintenance and servicing of the unit. In general, allow a minimum of 36 inches of clearance around all sides and above the unit. There should be no piping or conduit located over the unit. This will ensure easy access with an overhead crane or lift that may be needed to lift out heavier components should they need to be replaced or serviced.

Proper ventilation is another important consideration when locating the unit. Place the unit in an area that will not rise above 110°F. In addition, ensure the condenser and evaporator refrigerant pressure relief valves can vent in accordance with all local and national codes.

If the chiller has a remote air-cooled condenser, the remote condenser should be located outside and should be level to ensure proper operation. Allow a minimum of 48 inches of clearance between the remote 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.

Unit Sizing

The Performance Data section lists the various chiller performances at a select set of set points and condenser fluid or air conditions that cover the majority of design conditions common in industrial chiller applications.

Over-sizing chillers is sometimes necessary to allow for future growth. While this practice may be necessary, it is best chillers operate at 50% load or more to avoid unwanted reductions in system efficiency, excessive electrical power use, and compressor cycling due to reduced chiller loading. If the system design requires prolonged operating at reduced loads, we recommend considering the use of the hot gas bypass option for capacity control. An even better solution is to use two smaller chillers as operating smaller chillers at higher loads is preferred to operating one larger chiller at or near its minimum load capacity or with hot gas bypass for capacity control.

Process Fluid Temperature

The chiller can operate with a variety of different supply and return temperatures. The standard operating range for the fluid is 20°F to 75°F with a minimum entering coolant temperature of 22.5°F. The chiller can handle an initial pull down of a reservoir or process fluid loop on start-up up to 95°F entering fluid temperature. Under normal continuous operation, we recommend the entering water temperature not exceed 90°F.

Process Fluid Flow

The standard unit ratings and performance in this publication are for a coolant temperature rise of 10°F. The chiller is capable of operating with different operating temperature differentials within certain flow limitations and with correction to capacity, pressure drops, and other operating parameters. The minimum flow rates are required 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 0.00010 Ft^2 • Hr • °F/Btu.

If the process flow requirement is lower than the minimum flow limitation shown in Table 8, multiple smaller chillers may be used. Another alternative is to use a primary pumping loop designed for lower flow at a higher temperature rise through the process and a secondary pumping loop designed 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 at least 5°F above the set point of the chiller.

Table 8 – Standard Unit Flow Limitations

Chiller Model	Minimum Flow		Maximum Flow	
	Gpm	Psi	Gpm	Psi
MXW50	62	1.9	250	31.4
MXW75	88	1.9	350	30.0
MXW100	118	2.5	470	39.7
MXW125	148	2.6	592	42.2
MXR50	56	1.6	224	25.2
MXR75	78	1.5	312	23.8
MXR100	105	2.0	420	31.7
MXR125	133	2.1	532	34.1

The maximum flow limitations shown in Table 8 are the theoretical limits of the chiller based upon a 5°F drop through the chiller; however, the flows often times result in impractical pressure drops through the chiller. For systems designed for a temperature rise through the process of less than 10°F make sure to check the pressure loss through the chiller as shown in Figure 1 to ensure the pumping system sufficiently sized.

If the pressure loss through the chiller at design flow is excessive, a bypass around the chiller may be used. Another alternative is to use a primary pumping loop designed for higher flow and lower temperature rise through the process and a secondary pumping loop designed for lower flow and higher temperature drop through the chiller. If a secondary pumping loop is used, the mixed temperature of coolant entering the chiller must be a minimum of at least 5°F above the set point.

The use of varying coolant flows is sometimes necessary; however, it is highly recommended to use a dedicated evaporator circulation pump to provide increased system stability. The controls of the chiller are very adaptable and are capable of adjusting to variations in the flow of water through the system and will load and unload compressors and actuate any optional hot gas bypass valves as needed to maintain tight control of the leaving water temperature of the system.

If the cooler flow 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 ± 2°F leaving coolant temperature accuracy. The 3 gallons of coolant per ton of cooling is a practical minimal amount of coolant volume required to buffer fluctuations in the process enough that the chiller will generally see gradual rates of change in the inlet water temperature. This ensures the chiller is able to accurately load or unload the compressor that in turn will allow for very consistent and stable supply temperatures to the process. Use a system volume of 6 to 10 gallons of coolant per ton if the flow rate changes more rapidly than 10% per minute. 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. The chiller can tolerate up to 30% per minute coolant flow variation as long as the flow is equal to or above the minimum flow rate requirement shown in Table 8.

Condenser Air Temperature

All remote air-cooled condenser chillers have a factory selected remote air-cooled condenser designed specifically to meet the needs of the chiller module to which it is connected. The remote condensers have fan cycling and variable speed fan controls to maintain proper refrigerant pressures. The chiller controls allow the unit to start and operate when the chiller has load and the inlet air temperature is between -20°F and 110°F. The minimum ambient air temperature at which the chiller will start is -20°F based on still air.

System Fluid Freeze Protection

For applications where system fluid will be exposed to ambient conditions of 32°F or colder and/or the set point of the system will be below 45°F, add antifreeze to the system fluid to protect the chiller and system piping from potential damage. The amount of antifreeze will vary depending on the actual desired operating conditions and should be enough to provide freeze protection to temperatures 15°F colder than the coldest temperature anticipated. Use only antifreeze solutions designed for heat exchanger duty. Do not use automotive antifreeze because there is a potential for fouling that can occur once its relatively short-lived inhibitors break down.

Strainers

Each evaporator has a 20-mesh inlet strainer to protect the evaporator. For units with water-cooled condensers, we recommend a filtration system capable of filtering down to a minimum of a 20 mesh to protect the condenser from contamination.

Notes

Notes

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MX Series Product Catalog (2-236.4)
May 2017