THERMAL CARE

Superior equipment, Exceptional service

Product Catalog

NQ Series Portable and Remote Air-Cooled Condenser 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 Evaporators
High-efficiency stainless steel plates with copper brazing provide maximum performance, long life, and enhanced level of protection from harsh process conditions.

Stainless Steel Pump
Stainless steel pump selected for peak performance with the utmost in corrosion protection to ensure a long useful life under severe industrial conditions.

Nonferrous Reservoir and Water Lines
The insulated reservoir, fluid lines, pumps, and other components in the process fluid circuit will remain free of rust to provide maximum corrosion protection.

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.

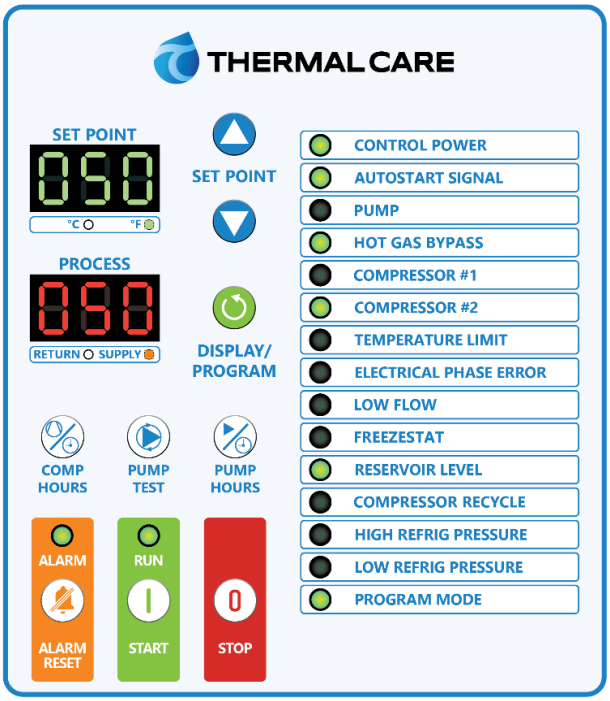
Wide Ambient Range
A wide range of indoor-duty air-cooled, water-cooled, or remote air-cooled condensers as well as outdoor air-cooled chillers fit a variety of applications.

Easy Access Cabinet
Heavy-gauge machine access doors with industrial grade tools-free latches provide quick access to all components for easy operation and maintenance.

Compressor Protection Technology
Our compressor protection technology uses start-to-start anti-recycle control logic to limit cycling under low-load operating conditions to extend compressor life.

Compressor and Pump Run Hour Displays
The ability to monitor compressor and pump running hours is useful and is an important tool to assist with scheduling maintenance.

Power Monitor
The main power monitoring system protects the chiller from extensive damage to the compressor and pump due to loss of phase or phase reversal in the main supply.



Standard Controller

Temperature Deviation Warnings and Alarms
A warning alerts the operator of a potential problem before a fault occurs and if the condition gets worse, an alarm stops the chiller to prevent damage.

Adjustable Deviation Alarm Time Delays
Allows for programing a start-up alarm time-delay to deactivate the alarms long enough for the process loop to stabilize before activating the alarms.

Reservoir Low Level Alarm
Indicates a low process fluid condition and protects the process pump and chiller from expensive damage caused by a critically low operating level in the reservoir.

Master Reset
The master reset function is a quick and easy way to reset and restore the control system to factory default settings if a control parameter is mistakenly changed.

Supply and Return Temperature Displays
The ability to view the process supply and return temperatures provides an additional tool for monitoring process conditions.

High-Quality 24 VDC Power Supply
The 24-volt DC power supply ensures dependable control circuit power and isolates the control circuit from static interference to ensure stable and precise operation.

Other Alarms

All chillers include loss of flow, freezestat, high and low refrigeration pressure, temperature sensor faults, and freezestat sensor fault alarms.

Warranty

5 year parts on standard controller, lifetime $175 exchange
3 year parts on the optional premium PLC controller
18 months parts on entire unit
1 year labor

Available Options

Variable-Speed Compressor

Chillers usually operate with process heat loads less than 100% of available chiller capacity. With increasing emphasis on energy efficiency, we offer a variable-speed scroll compressor option for improved part-load efficiency.

Most chillers use fixed-speed compressors with a hot gas bypass valve for capacity control, which bypasses hot discharge refrigerant gas back into the compressor to simulate 100% load. This keeps the compressor running at full speed all the time.

Our variable-speed scroll compressor technology varies the compressor speed to match the process load. This means the compressor slows down under part load conditions for peak performance and reduced power use.

5-Ton Variable-Speed Option Payback (Years)

Hours of Operation	Process Load (Percent of Full Capacity)								
	50%	55%	60%	65%	70%	75%	80%	85%	90%
4,000/year	3.6	3.9	4.3	4.9	5.6	6.7	8.6	12.3	23.3
6,000/year	2.4	2.6	2.9	3.2	3.7	4.5	5.7	8.2	15.5
8,400/year	1.7	1.9	2.1	2.3	2.7	3.2	4.1	5.9	11.1

Based on $0.10/kWHr power cost

10-Ton Variable-Speed Option Payback (Years)

Hours of Operation	Process Load (Percent of Full Capacity)								
	50%	55%	60%	65%	70%	75%	80%	85%	90%
4,000/year	1.3	1.4	1.5	1.7	1.9	2.2	2.7	3.6	5.7
6,000/year	0.9	0.9	1.0	1.1	1.3	1.5	1.8	2.4	3.8
8,400/year	0.6	0.7	0.7	0.8	0.9	1.0	1.3	1.7	2.7

Based on $0.10/kWHr power cost

15-Ton Variable-Speed Option Payback (Years)

Hours of Operation	Process Load (Percent of Full Capacity)								
	50%	55%	60%	65%	70%	75%	80%	85%	90%
4,000/year	1.1	1.2	1.4	1.5	1.8	2.2	2.9	4.6	11.8
6,000/year	0.8	0.8	0.9	1.0	1.2	1.5	2.0	3.0	7.9
8,400/year	0.5	0.6	0.6	0.7	0.9	1.0	1.4	2.2	5.6

Based on $0.10/kWHr power cost

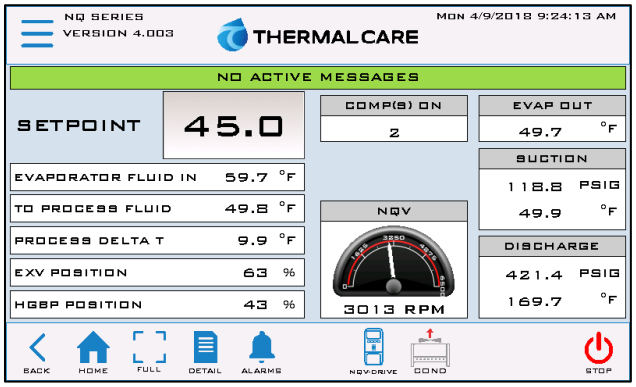
20-Ton Variable-Speed Option Payback (Years)

Hours of Operation	Process Load (Percent of Full Capacity)								
	50%	55%	60%	65%	70%	75%	80%	85%	90%
4,000/year	1.4	1.5	1.6	1.8	2.2	2.6	3.5	5.5	14.1
6,000/year	0.9	1.0	1.1	1.2	1.4	1.8	2.3	3.6	9.4
8,400/year	0.6	0.7	0.8	0.9	1.0	1.3	1.7	2.6	6.7

Based on $0.10/kWHr power cost

PLC and Color Touch-HMI

Standard on units with the variable-speed compressor option and available on all others, this option provides a PLC with 7-inch color touch screen HMI to provide an enhanced level of monitoring and control.



Sample of a Home Screen

Hand-Held Remote Control

As standard, the chillers come with a control display mounted in the control panel of the chiller. In applications where the chiller is outdoors, or in an area not frequented by the operator, a remote hand-held control display is available. This option provides a second operator interface identical in function to the primary control display on the chiller. This option includes as standard a 50-foot wire for connection between the remote hand-held controller and the chiller.

Alarm Horn and/or Alarm Relay

Provides an alarm horn that sounds when a fault condition occurs. In addition there is an alarm contact that closes whenever a fault condition occurs.

Rotary Non-Fused Disconnect Switch

Provides a rotary non-fused disconnect switch with a through the door round rotary disconnect handle.

Rotary Fused Disconnect Switch
Provides a rotary fused disconnect switch with a through the door round rotary disconnect handle.

UL508A Industrial Control Panel (cULus Listed)
Adds circuit breakers to pump and compressor starters and provides branch circuit protection and documentation.

Indoor-Duty, Condenser Air Range of 0°F to 110°F
For chillers located indoors where the ambient air temperature is between 0°F and 110°F, this option includes flooded head pressure controls, liquid receiver and liquid line solenoid valve. This option is available with or without the epoxy coated condenser coil option.

Indoor-Duty, Condenser Air Range of 60 to 122°F
For chillers located indoors where the ambient air temperature is between 60°F and 122°F. For chillers with a remote air-cooled condenser, the remote condenser is typically oversized to account for the higher ambient air temperatures. For chillers with an integral air-cooled condenser, the sizes of the condensers are limited by the cabinet size so this option includes switching to R407C refrigerant. This option is available with or without the epoxy coated condenser coil option.

Outdoor-Duty, Condenser Air Range of 0 to 110°F
For chillers located outdoors and exposed to rain, snow, direct sunlight, and ambient air temperatures between 0°F and 110°F, this option includes flooded head pressure controls, liquid receiver, liquid line solenoid valve, controller window kit (for units with standard controller) or sever-duty HMI (units with the PLC option), upgrades the base metal of all powder coat painted cabinet components to galvanized steel, and changes zinc coated fasteners to stainless steel. This option is available with or without the epoxy coated condenser coil option.

Outdoor-Duty, Condenser Air Range of 0 to 122°F
For chillers located outdoors and exposed to rain, snow, direct sunlight, and ambient air temperatures between 0°F and 122°F. For chillers with a remote air-cooled condenser, the remote condenser is typically oversized to account for the higher ambient air temperatures. For chillers with integral air-cooled condensers, the sizes of the condensers are limited by the cabinet size so this option includes switching to R407C refrigerant. In addition, this option includes flooded head pressure controls, controller window kit (for units with standard controller) or sever-duty HMI (units with the PLC option), upgrades the base metal of all powder coat painted cabinet components to galvanized steel, and changes zinc coated fasteners to stainless steel. This option is available with or without the epoxy coated condenser coil option.

Outdoor-Duty, Condenser Air Range of -20 to 110°F
For chillers located outdoors and exposed to rain, snow, direct sunlight, and ambient air temperatures between -20°F and 110°F, this option includes flooded head pressure controls, control panel heater, controller window kit (for units with standard controller) or sever-duty HMI (units with the PLC option), upgrades the base metal of all powder coat painted cabinet components to galvanized steel, and changes zinc coated fasteners to stainless steel. This option is available with or without the epoxy coated condenser coil option.

Condenser Coil Coating
For applications where a chiller with an integral air-cooled condenser or 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. For chiller with integral air-cooled condenser this option also includes upgrading all galvanized internal chiller brackets to stainless steel.

Pump and Tank Deduct
For applications where the internal plastic tank and stainless steel pump are not required, this option removes the internal pump and tank. The supply and return connections are located in the same locations as the standard chiller and the pump running hour meter, pump motor overload, and reservoir low-level alarm are not functional. In addition, if this option is selected the automatic water make-up option is not available.

Oversized Reservoirs
The standard size reservoirs are for nominal flows for a chiller operating with a 10°F temperature rise through the process. Some applications require more process fluid in the tank to act as a thermal flywheel for sudden variations in the process temperature rise. In other instances with high flows, the larger reservoir helps reduce turbulence in the reservoir. The maximum size of the reservoir is different for each size chiller and determined by the pump size and space in the chiller cabinet. Contact your local agent or one of the factory sales engineers for assistance in selecting and pricing this option for your application.

Automatic Water Make-up

This option adds a high and mid-level sensor, a solenoid valve, and a connection on the back of the chiller for a make-up fluid source. With this option, the chiller monitors the level of coolant in the reservoir and if the level drops to the make-up low-level, the solenoid valve opens to let make-up water fill the reservoir. The make-up valve remains open until the high-level sensor senses the water level is sufficient.

Water Circuit Designed for De-ionized Water

Standard chillers feature a water circuit with stainless steel pump, stainless steel evaporator, a plastic tank, and all non-ferrous water piping to provide protection from corrosion and ensure long useful life. In certain applications where the electrical properties of the coolant in the process equipment requires the unit to be filled with de-ionized water this option replaces any materials necessary to allow the unit to be filled with and operate with de-ionized water with conductivity down to 1 µSiemen/cm (NCCLS Type III).

Stainless Steel Cabinetry

Standard chillers feature powder coat painted steel cabinets; however, some applications require an enhanced appearance or durability and this option upgrades painted cabinet components to stainless steel.

High-Pressure, Variable-Speed EC Fan

Chillers with integral air-cooled condensers include fixed-speed AC fan motors designed to draw air in through the condensers and discharge the warm discharge air into an open space such as a production area. In some applications, the heat given off from the chiller is unwanted in the production area, especially if that space is air conditioned, so this option upgrades the fans to a high-power EC fan motor to provide additional discharge pressure for ducting the discharge air away from the chiller. In addition to providing added discharge pressure, this option uses high-efficiency variable-speed EC fan motors that vary speed to maintain the refrigerant head pressure. This provides better control of the chiller operation and allows for some energy savings and noise reduction when operating at a lower load and/or the condenser air temperature is cool enough to allow for a reduced airflow through the chiller.

Chiller Model	Air Flow (cfm)	Standard Fans		High Pressure Variable Speed Fans	
		Available External Static Pressure (in W.C.)	Sound Pressure @ 1 Meter (dBA)	Available External Static Pressure (in W.C.)	Sound Pressure @ 1 Meter (dBA)
NQA04	4,000	0.22	74	0.42	75
NQA05	4,000	0.22	74	0.42	75
NQA08	8,000	0.10	74	0.32	75
NQA10	8,000	0.10	74	0.32	75
NQA13	8,000	0.00	82	0.32	75
NQA15	10,450	0.00	82	0.77	82
NQA20	18,000	0.00	85	0.79	84
NQA25	20,000	0.00	85	0.75	85
NQA30	24,000	0.23	87	1.12	82

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 via RS-485. This option includes any controller expansion hardware required. A full list of available inputs/outputs as well as read/write privileges are in the Installation and Operation Manual. The standard controller has one expansion slot, which this option uses making this option unavailable with the remote hand-held controller, SPI, or 4 to 20 mA coolant supply temperature retransmit options. The chiller can operate with only one communications protocol so this option is not available with any other communications port option.

SPI Communications Port

For applications where there is a need to communicate with an external monitoring or control system using SPI communications, a SPI communications port is available. This option provides an additional controller expansion hardware and software. A full list of available inputs/outputs as well as read/write privileges are in the NQ Series Installation and Operation Manual. The standard controller has one expansion slot, which this option uses so this option is not available with the remote hand-held controller, ModBUS RTU, or 4 to 20 mA coolant supply temperature retransmit options. The chiller can operate with only one communications protocol so this option is not available with any other communications port option. This option is not available with any of the PLC controller 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 to provide additional controller expansion hardware and software. For units ordered with the standard controller this option adds a ModBUS expansion board to the controller, a ModBUS to BACnet gateway. The standard controller has one expansion slot, which this option uses so this option is not available with the remote hand-held controller, SPI, or 4 to 20 mA coolant supply temperature retransmit options. For chillers ordered with one of the PLC controller options this option adds a ModBUS expansion cassette, a ModBUS to BACnet gateway. The chiller can operate with only one communications protocol so this option is not available with any other communications port option.

LonWorks Communications Port

For applications where there is a need to communicate with an external monitoring or control system using LonWorks communications, a LonWorks communications port is available to provide additional controller expansion hardware and software. For units ordered with the standard controller this option adds a ModBUS expansion board to the controller, a ModBUS to LonWorks gateway. The standard controller has one expansion slot, which this option uses so this option is not available with the remote hand-held controller, SPI, or 4 to 20 mA coolant supply temperature retransmit options. For chillers ordered with one of the PLC controller options this option adds a ModBUS expansion cassette, a ModBUS to BACnet gateway. The chiller can operate with only one communications protocol so this option is not available with any other communications port option.

Coolant Supply Temperature Retransmit

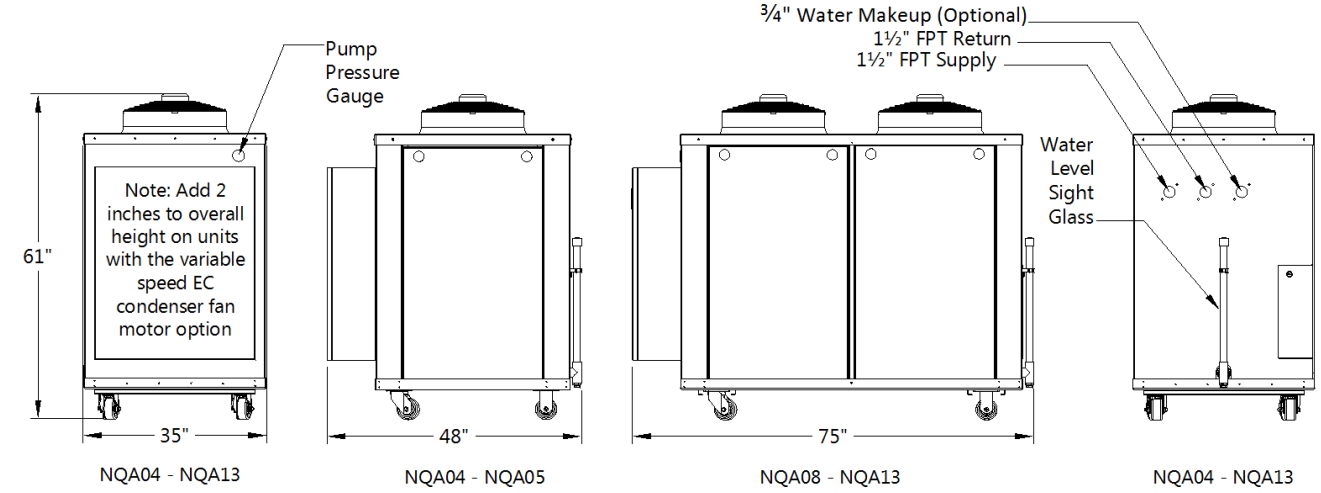
For applications where there is a need for a 4 to 20 mA output of the coolant temperature leaving the chiller, a 4 to 20 mA coolant supply temperature retransmit is available to provide a 4 to 20 mA output signal of the coolant supply temperature. For units ordered with the standard controller this option adds an analog output expansion board. There is one expansion port on the standard control board so this option is not available with the remote hand-held controller or communication port options. For units ordered with the PLC controller option this option provides an output on one of the PLC analog output cassettes.

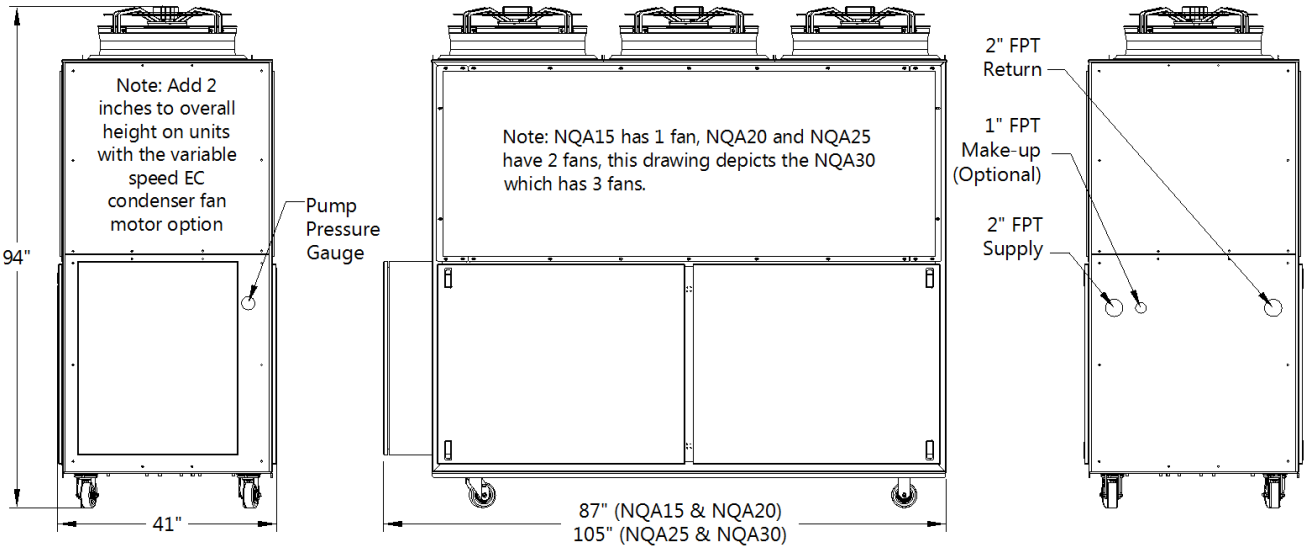
Physical Data

Air-Cooled Condenser Chillers

Model	NQA04	NQA05	NQA08	NQA10	NQA13	NQA15	NQA20	NQA25	NQA30
Cooling Capacity (tons)[1]	4	5	8	11	13	15	21	26	31
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
Compressor (qty)	1	1	1	1	1	1	2	2	2
Sound Pressure @ 1 meter (dBA)	74	74	76	76	76	82	84	84	86
Pump Motor Size (hp)	1.5	1.5	1.5	2	2	3	5	5	5
Pump Flow (gpm)	11	12	19	27	30	36	48	60	72
Net Available Pump Pressure (psi)[2]	39	39	37	38	37	44	54	54	49
Reservoir Holding Capacity (gal)	11	11	22	22	22	40	50	67	67
Shipping Weight (lbs)	720	720	1,195	1,195	1,215	3,200	3,300	3,800	4,150
Operating Weight (lbs)	810	810	1,380	1,380	1,400	3,535	3,715	4,360	4,710
MCA @ 460/3/60 (amps)[3]	16	18	26	31	37	44	58	70	83
MOP @ 460/3/60 (amps)[4]	25	30	45	60	70	80	80	100	125

[1]Cooling tons based on 12,000 BTU/Hr/ton with 50°F leaving coolant and 95°F ambient air, R410A refrigerant.
[2]Net available pressure at outlet of chiller is pump discharge pressure less the internal pressure loss through the fluid circuit.
[3]MCA is Minimum Circuit Amps with standard condenser fan(s) and pump under full load, used for minimum wire size requirement.
[4]MOP is Maximum Overcurrent Protection with standard condenser fans(s) and pump, used for sizing main power protection devices.

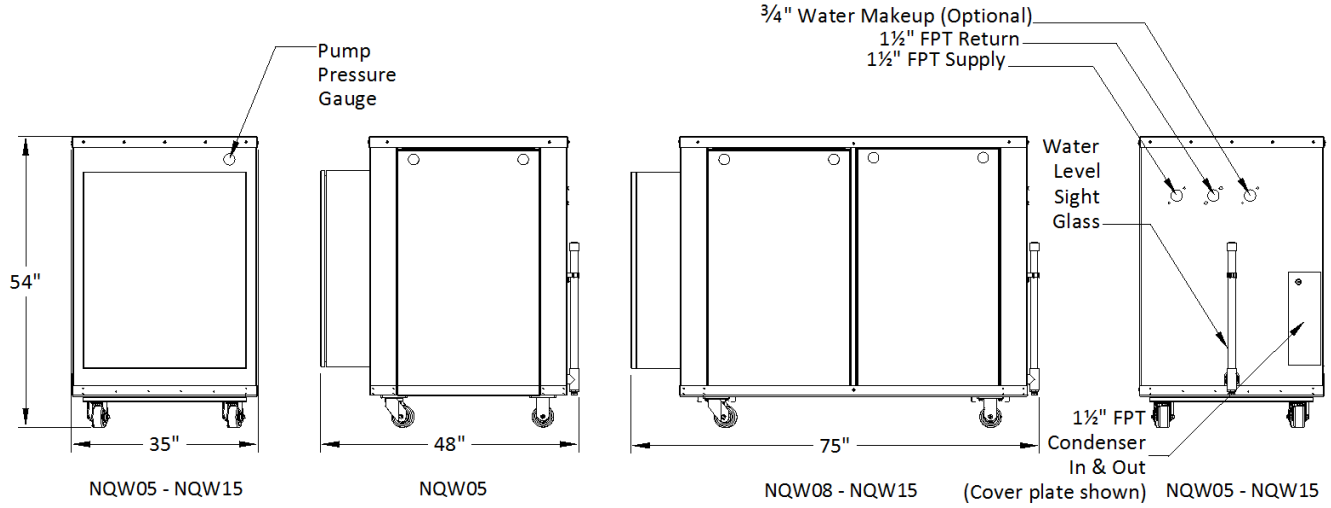


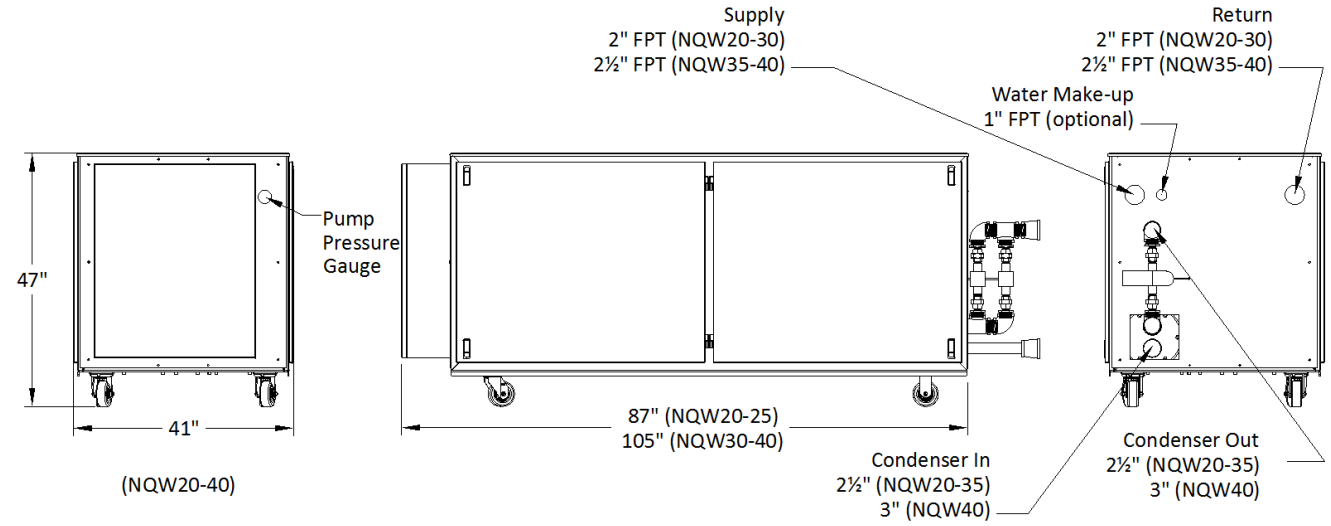


Water-Cooled Condenser Chillers

Model	NQW05	NQW08	NQW10	NQW15	NQW20	NQW25	NQW30	NQW35	NQW40
Cooling Capacity (tons)[1]	6	8	12	17	23	28	33	38	43
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
Compressor (qty)	1	1	1	1	2	2	2	2	2
Sound Pressure @ 1 meter (dBA)	70	70	71	73	74	74	75	77	78
Pump Motor Size (hp)	1.5	1.5	2	3	5	5	5	5	5
Pump Flow (gpm)	13	20	29	39	54	67	79	92	102
Net Available Pump Pressure (psi)[2]	38	35	36	40	50	50	45	43	39
Reservoir Holding Capacity (gal)	11	22	22	22	50	50	67	67	67
Shipping Weight (lbs)	720	1,195	1,195	1,315	1,900	2,100	2,250	3,400	3,900
Operating Weight (lbs)	810	1,380	1,380	1,500	2,315	2,515	2,810	3,960	4,460
MCA @ 460/3/60 (amps)[3]	16	23	28	40	49	61	69	74	78
MOP @ 460/3/60 (amps)[4]	30	40	50	70	70	90	100	110	110

[1]Cooling tons based on 12,000 BTU/Hr/ton with 50°F leaving coolant and 85°F condenser water, R410A refrigerant.
[2]Net available pressure at outlet of chiller is pump discharge pressure less the internal pressure loss through the fluid circuit.
[3]MCA is Minimum Circuit Amps with standard pump under full load, used for minimum wire size requirement.
[4]MOP is Maximum Overcurrent Protection with standard pump, used for sizing main power protection device.

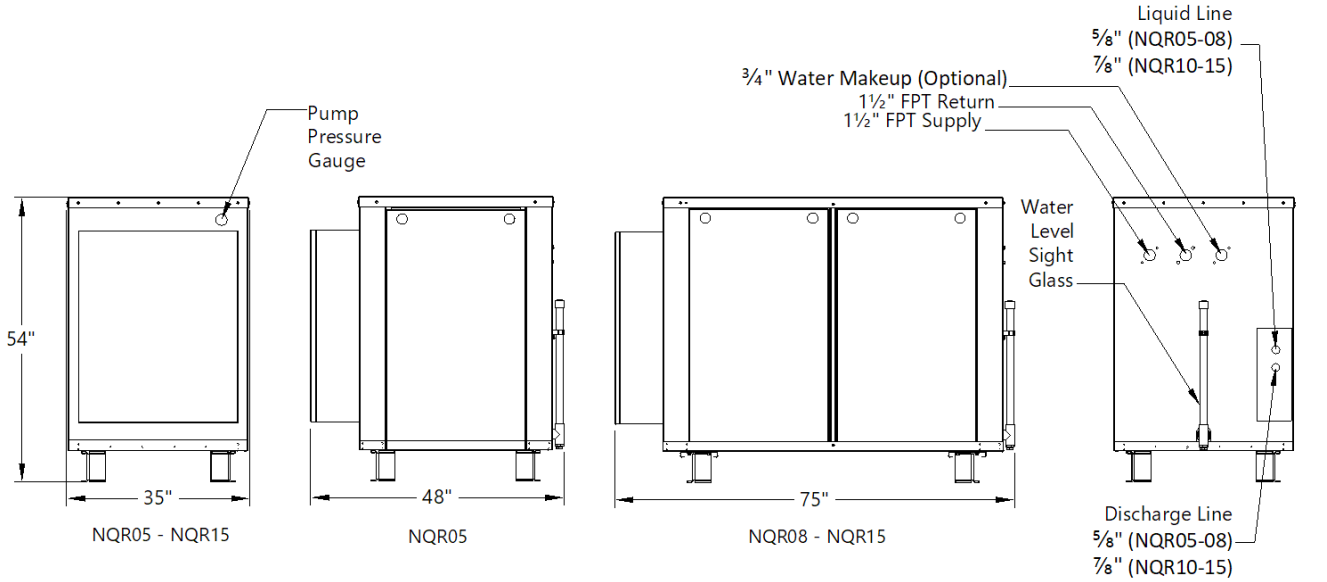


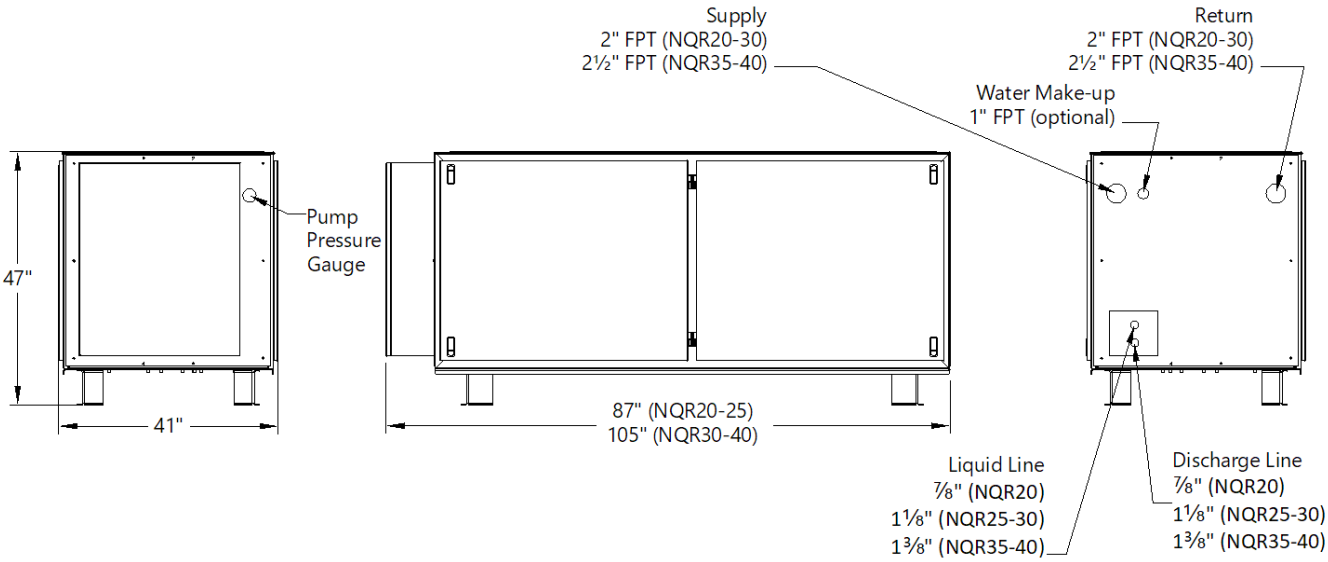


Remote Air-Cooled Condenser Chillers

Model	NQR05	NQR08	NQR10	NQR15	NQR20	NQR25	NQR30	NQR35	NQR40
Cooling Capacity (tons)[1]	5	8	11	15	21	26	31	35	40
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
Compressor (qty)	1	1	1	1	2	2	2	2	2
Sound Pressure @ 1 meter (dBA)[2]	70	70	71	73	74	74	75	77	78
Pump Motor Size (hp)	1.5	1.5	2	3	5	5	5	5	5
Pump Flow (gpm)	13	18	27	36	50	61	73	83	92
Net Available Pump Pressure (psi)[3]	38	38	38	44	53	53	49	47	44
Reservoir Holding Capacity (gal)	11	22	22	22	50	50	67	67	67
Shipping Weight (lbs)	720	1,195	1,195	1,315	1,900	2,100	2,250	3,400	3,900
Operating Weight (lbs)	810	1,380	1,380	1,500	2,315	2,515	2,810	3,960	4,460
MCA @ 460/3/60 (amps)[4]	16	23	28	40	49	61	69	74	78
MOP @ 460/3/60 (amps)[5]	30	40	50	70	70	90	100	110	110

[1]Cooling tons based on 12,000 BTU/Hr/ton with 50°F leaving coolant and 95°F ambient air, R410A refrigerant.
[2]Sound pressure is for the chiller unit only. See the Remote Air-Cooled Condenser table for remote condenser sound pressures.
[3]Net available pressure at outlet of chiller is pump discharge pressure less the internal pressure loss through the fluid circuit.
[3]MCA is Minimum Circuit Amps with standard pump under full load, used for minimum wire size requirement.
[4]MOP is Maximum Overcurrent Protection with standard pump, used for sizing main power protection device.



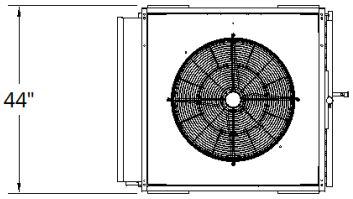


Remote Air-Cooled Condensers

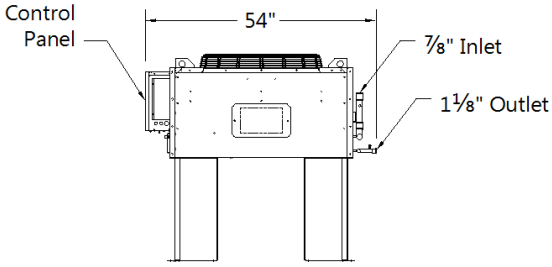
Condenser Model	KCM009	KCM011	KCM014	KCL023	KCL030	KCL037	KCL045	KCL054	KCL056
Chiller Used With	NQR05	NQR08	NQR10	NQR15	NQR20	NQR25	NQR30	NQR35	NQR40
Fans (qty)	1	1	2	2	2	2	3	3	3
Shipping Weight (lbs)	245	265	415	680	720	1,050	1,075	1,175	1,450
Operating Weight (lbs)	Varies based on system charge and operating conditions								
MCA @ 460/3/60 (amps)[1]	1.4	1.4	2.6	7	7	7	10.1	10.1	10.1
MOP @ 460/3/60 (amps)[2]	15	15	15	15	15	15	15	15	15

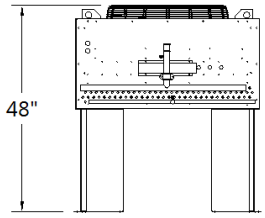
[1]MCA is Minimum Circuit Amps, used for minimum wire size requirement.

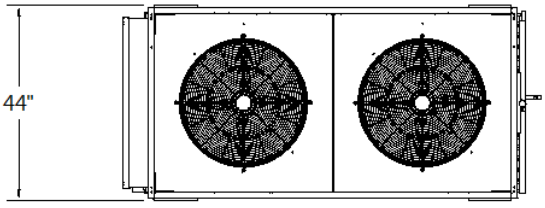
[2]MOP is Maximum Overcurrent Protection, used for sizing main power protection device.



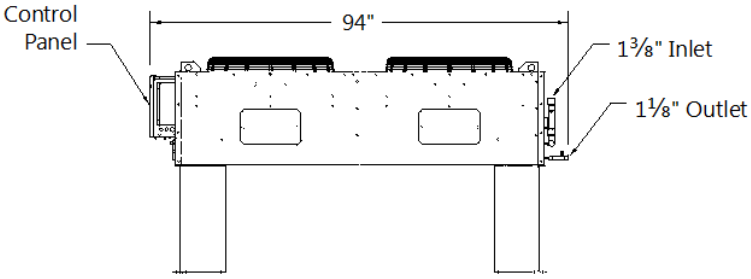
KCM009 used with Model NQR05 chiller
KCM011 used with Model NQR08 chiller

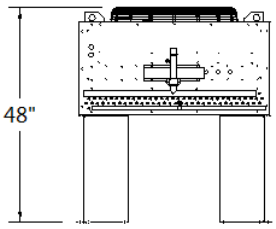


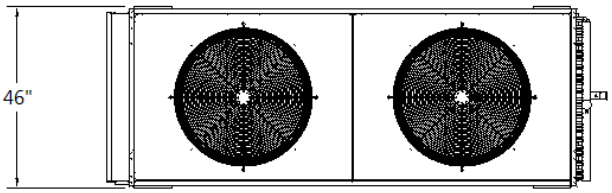




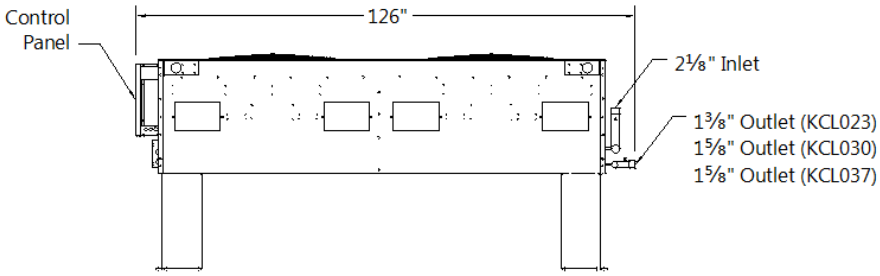
KCM014 used with Model NQR10 chiller

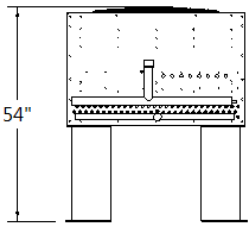


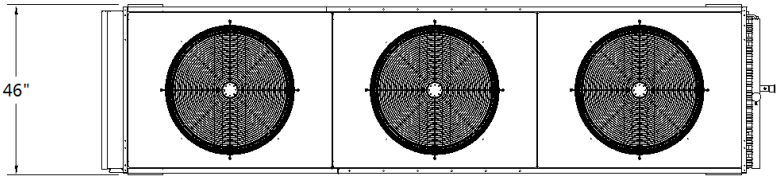




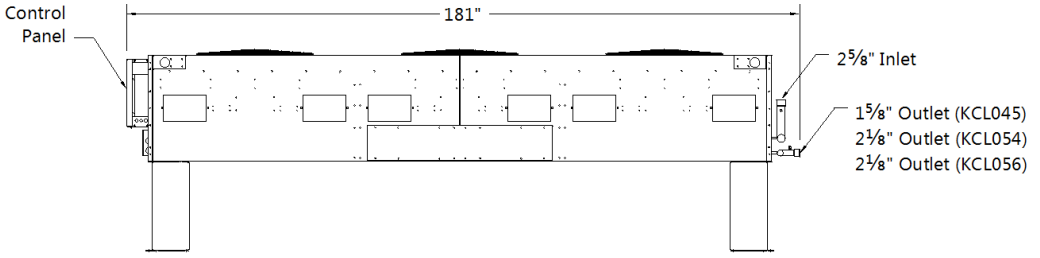
KCL023 used with Model NQR15 chiller
KCL030 used with Model NQR20 chiller
KCL037 used with Model NQR25 chiller

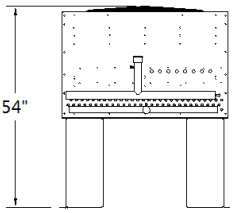




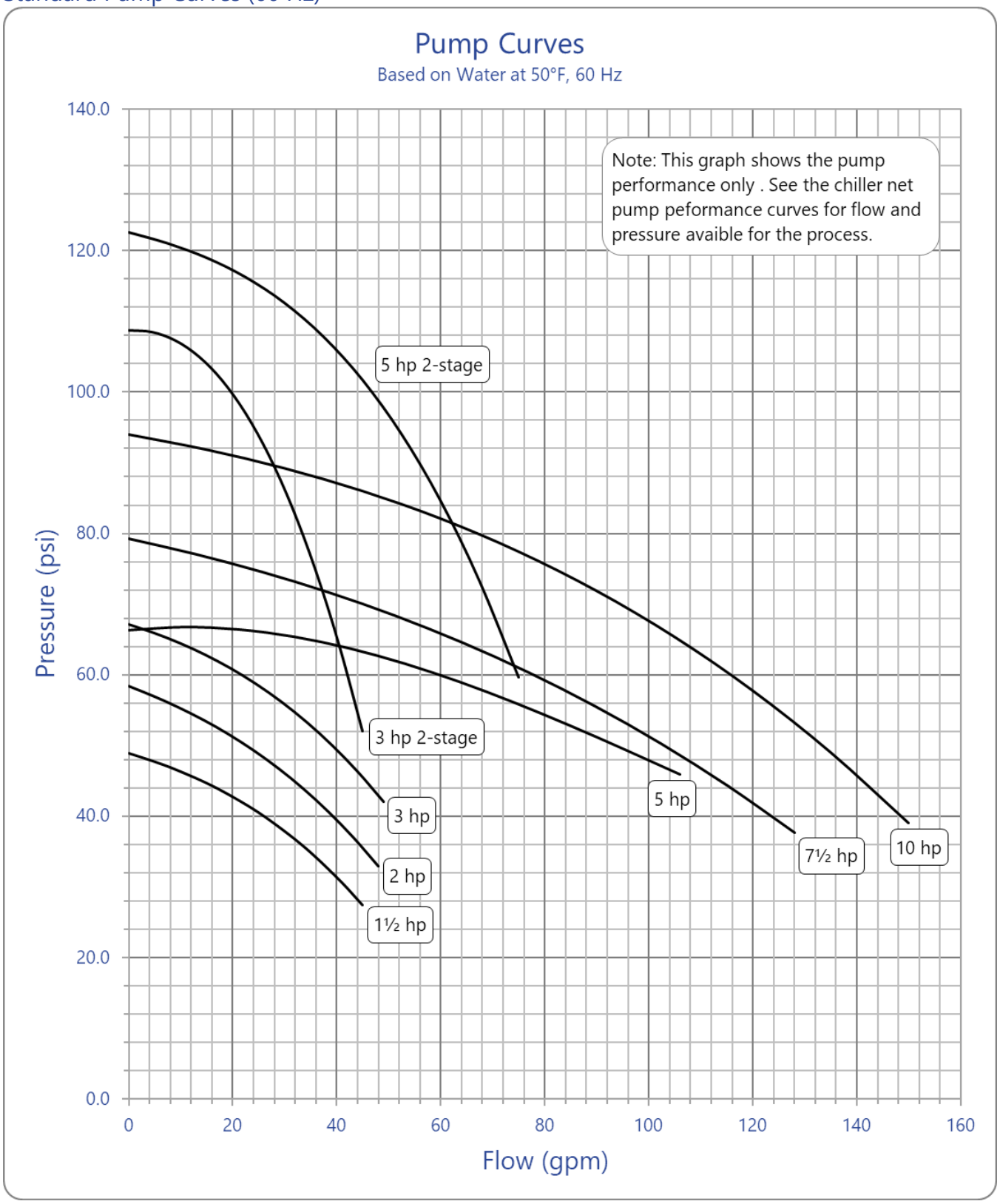


KCL045 used with Model NQR30 chiller
KCL054 used with Model NQR35 chiller
KCL056 used with Model NQR40 chiller

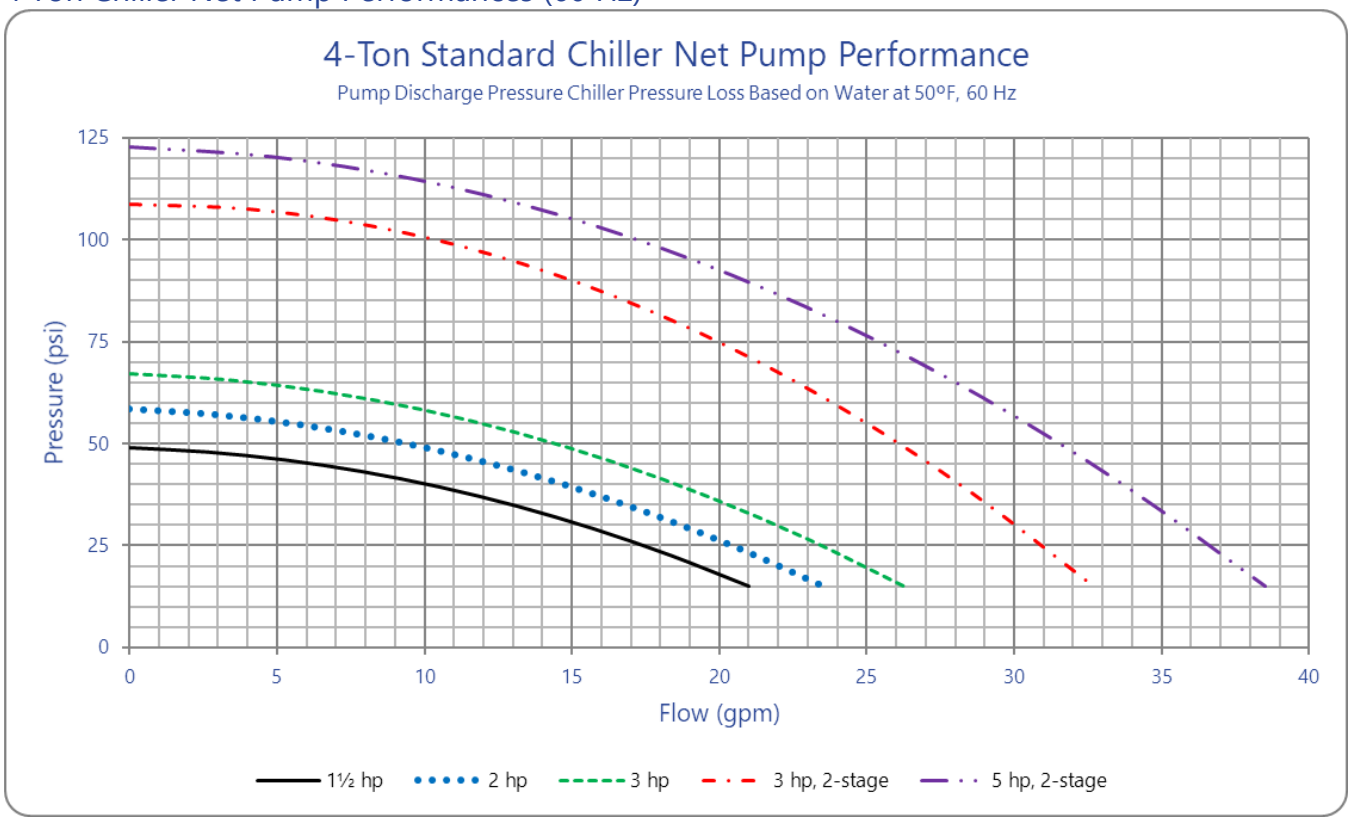




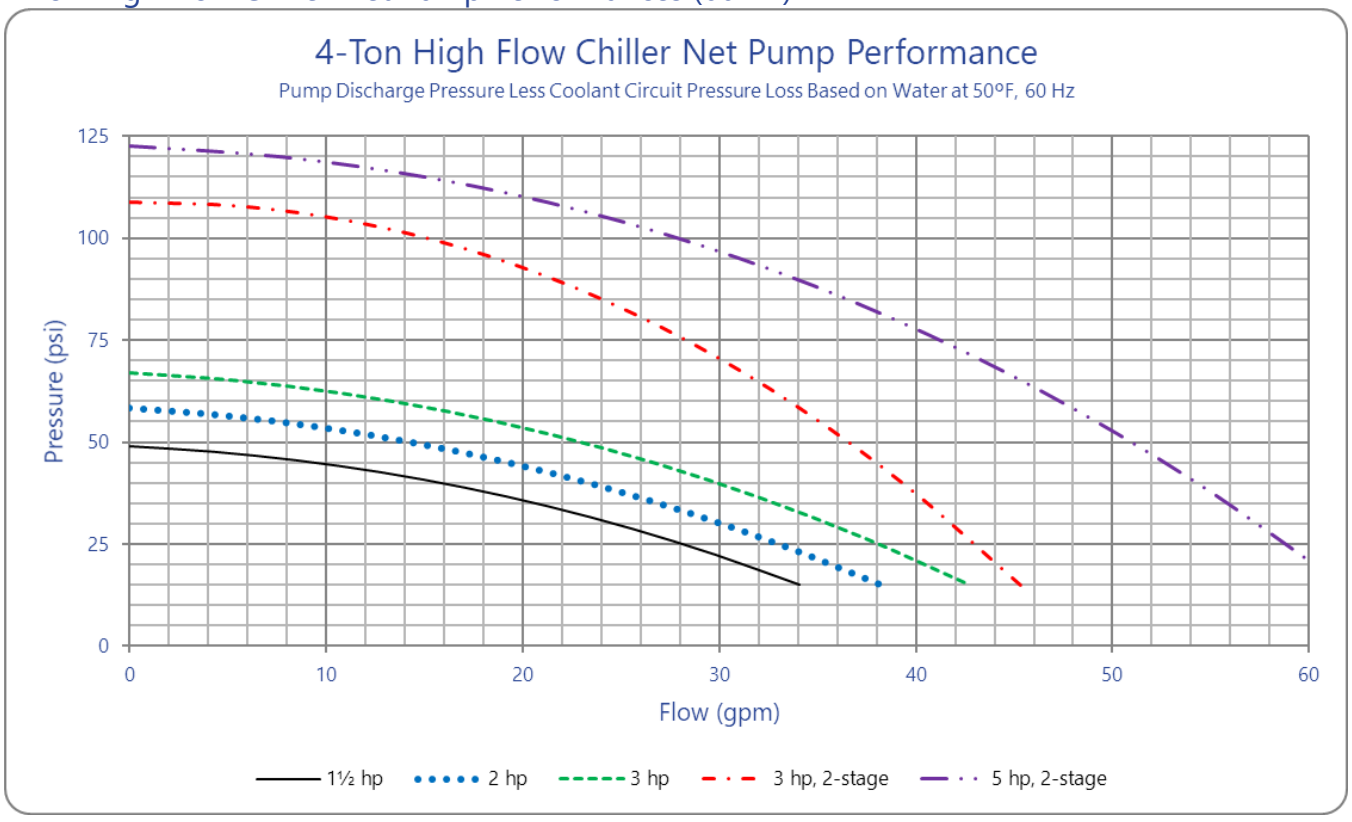
Standard Pump Curves (60 Hz)



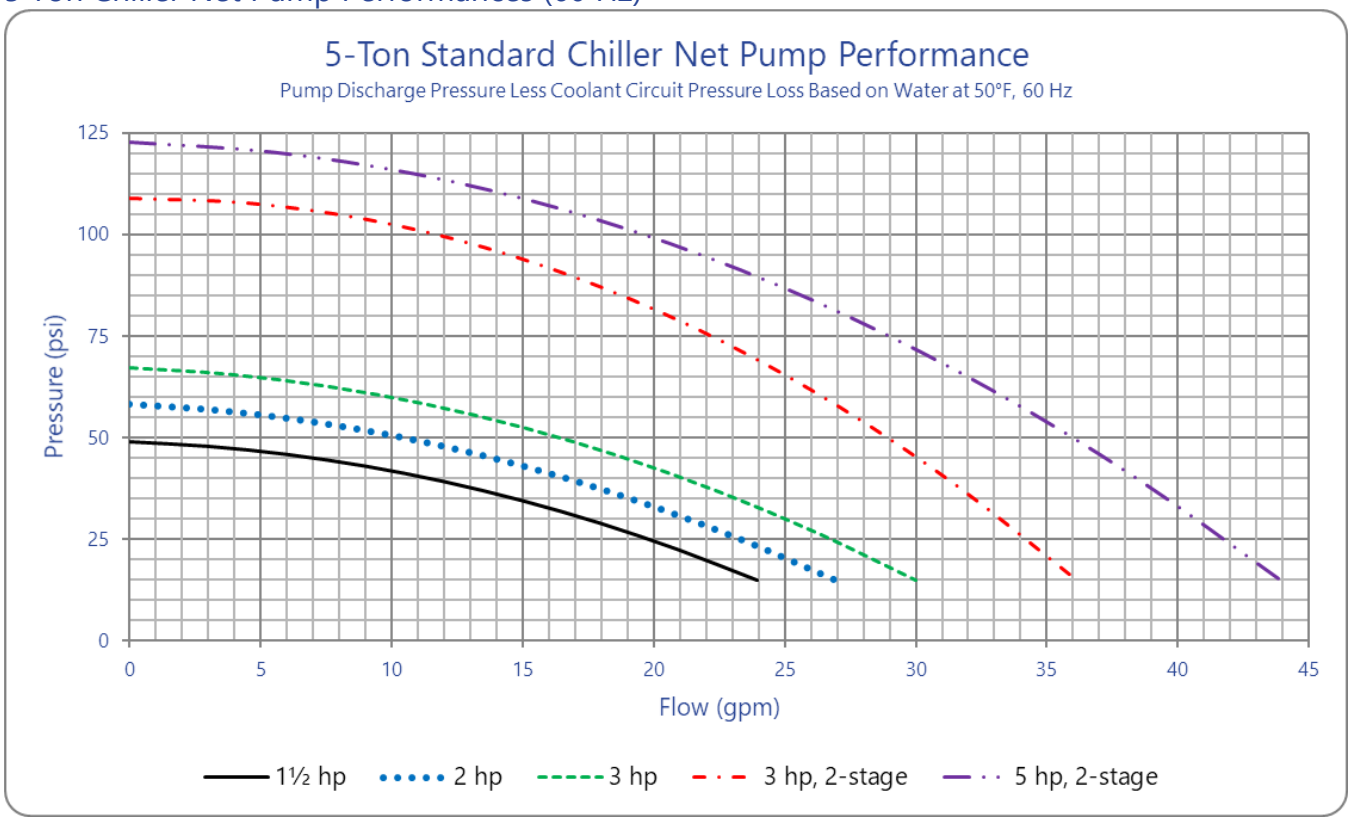
4 Ton Chiller Net Pump Performances (60 Hz)



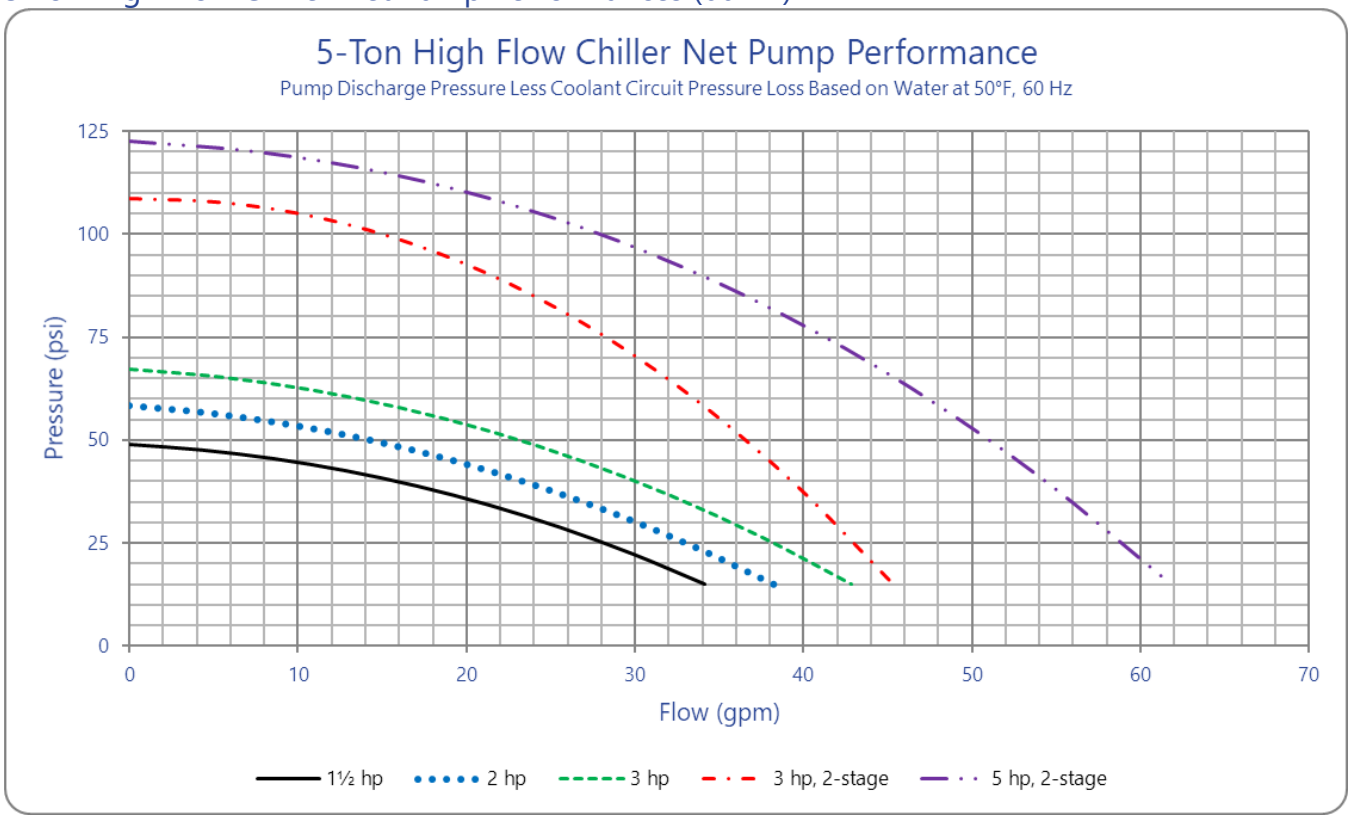
4 Ton High Flow Chiller Net Pump Performances (60 Hz)



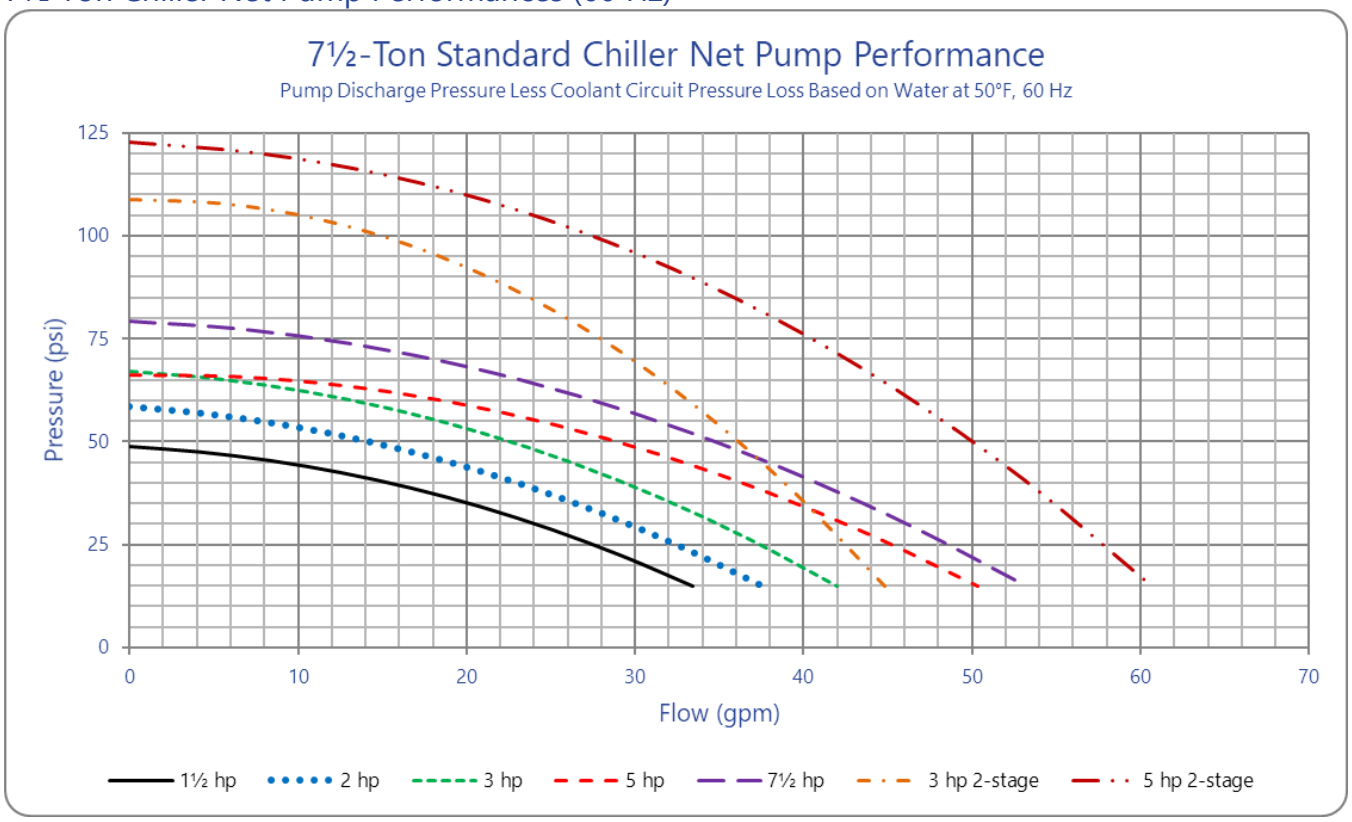
5 Ton Chiller Net Pump Performances (60 Hz)



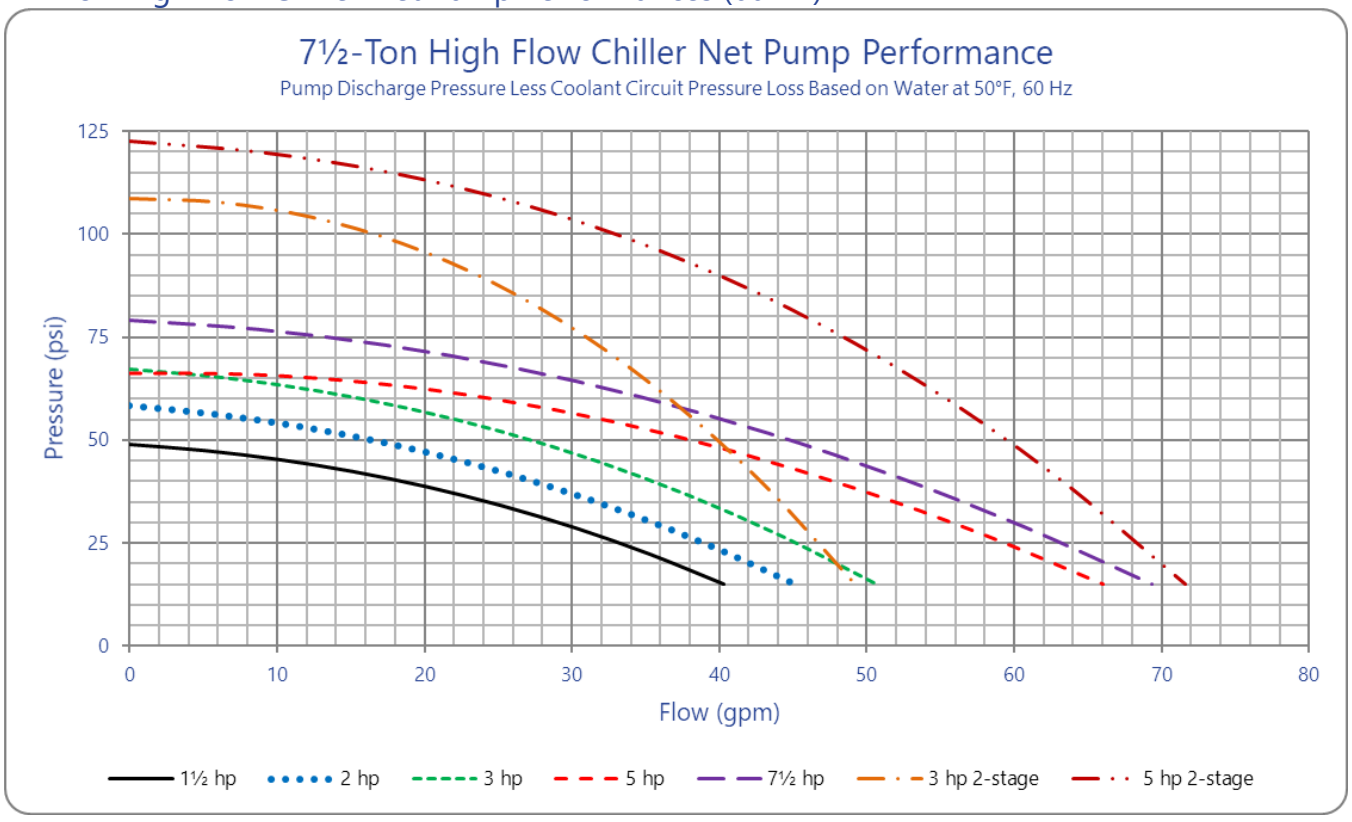
5 Ton High Flow Chiller Net Pump Performances (60 Hz)



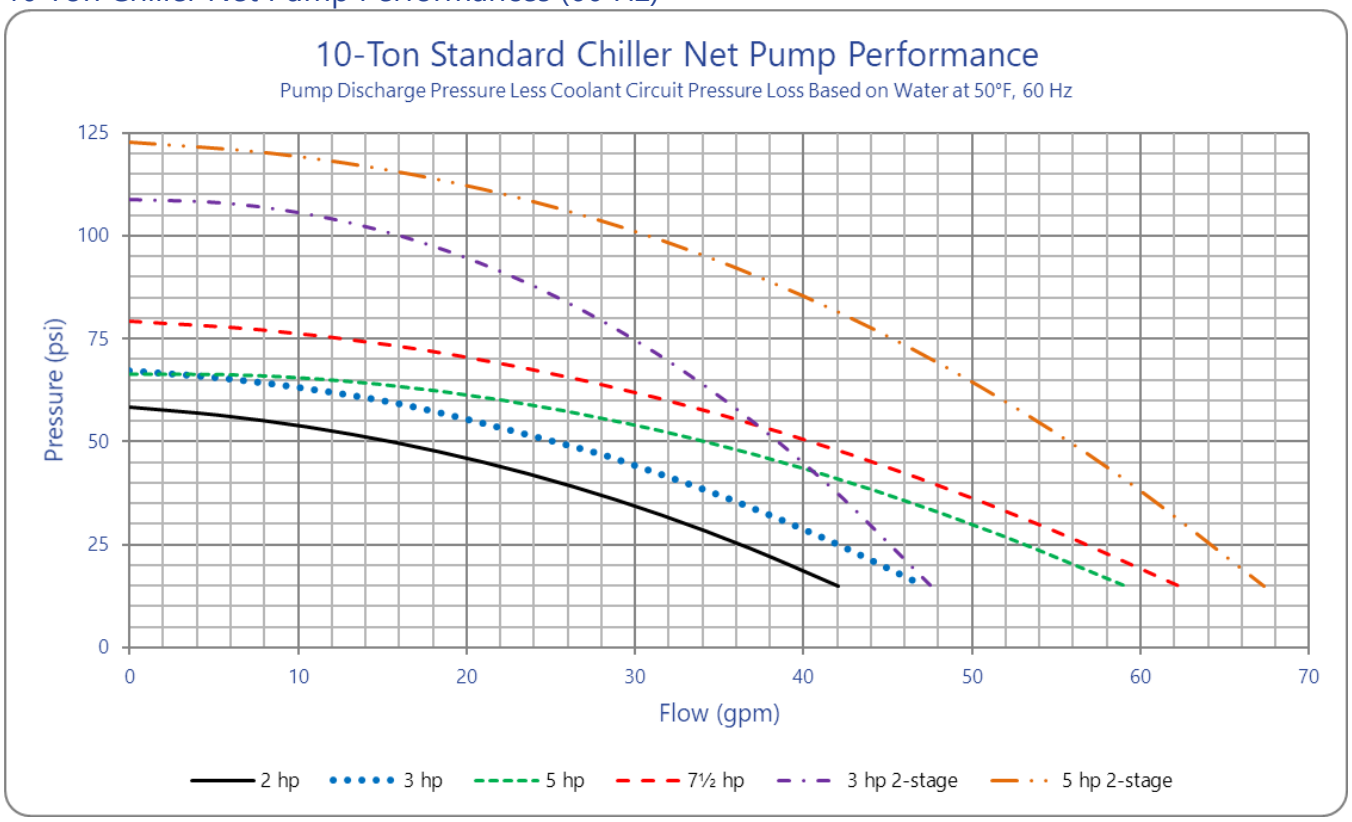
7½ Ton Chiller Net Pump Performances (60 Hz)



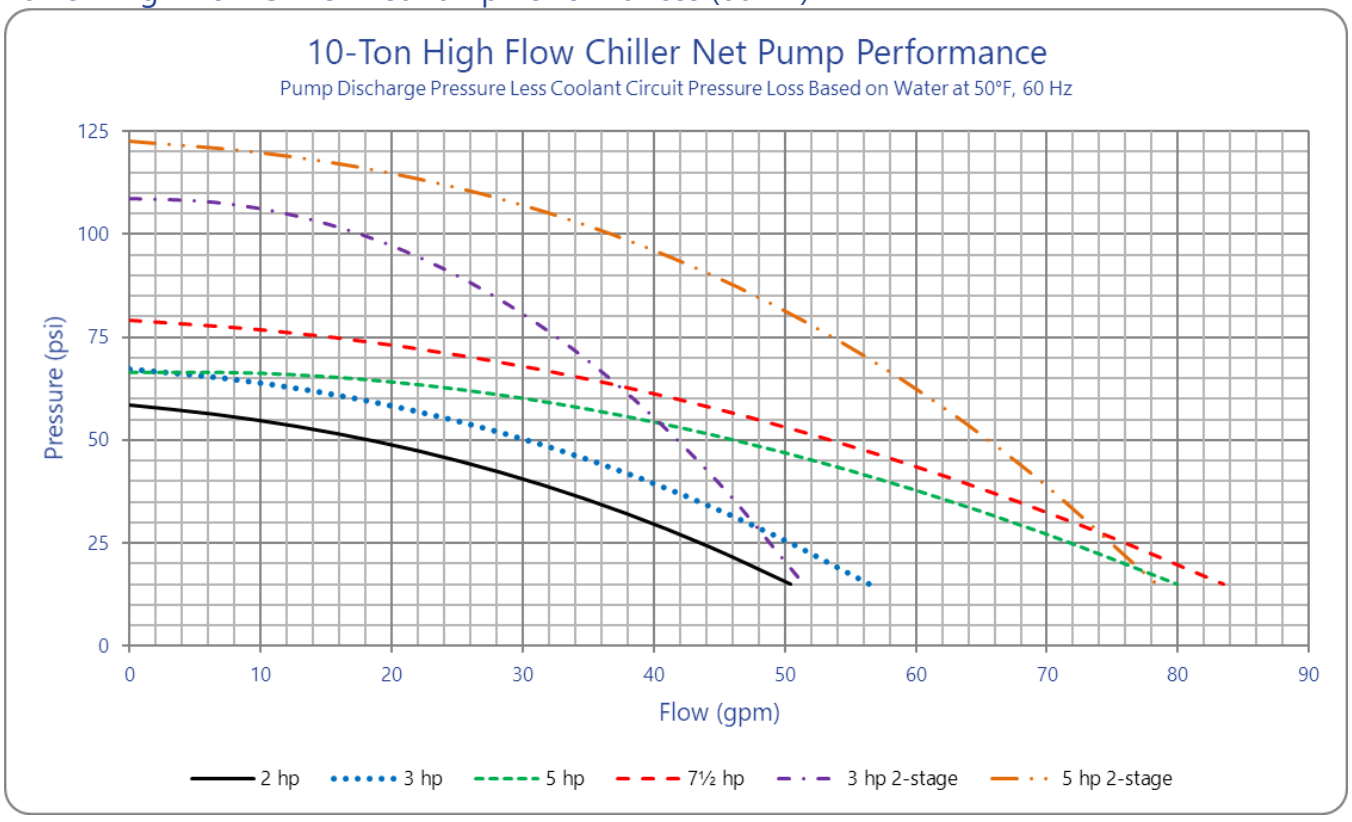
7½ Ton High Flow Chiller Net Pump Performances (60 Hz)



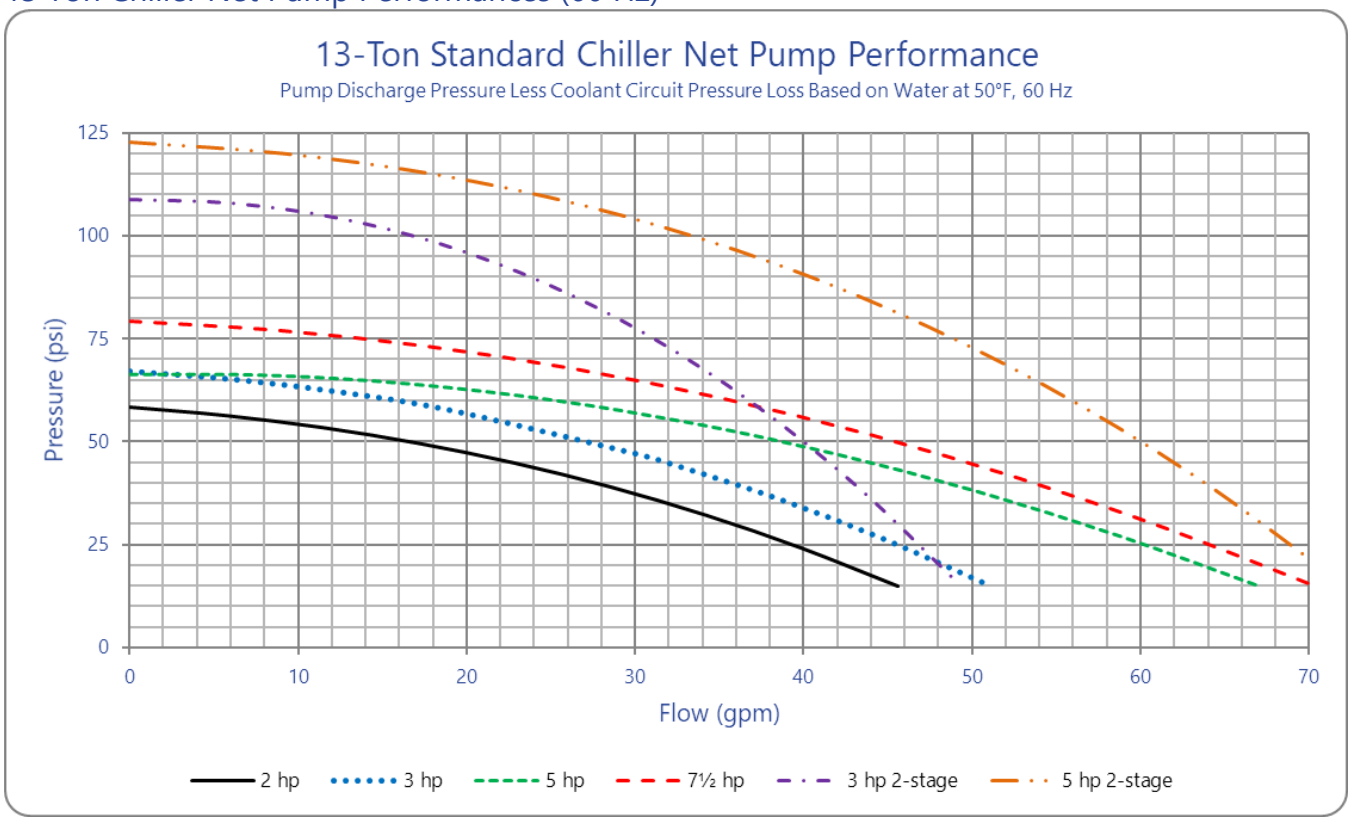
10 Ton Chiller Net Pump Performances (60 Hz)



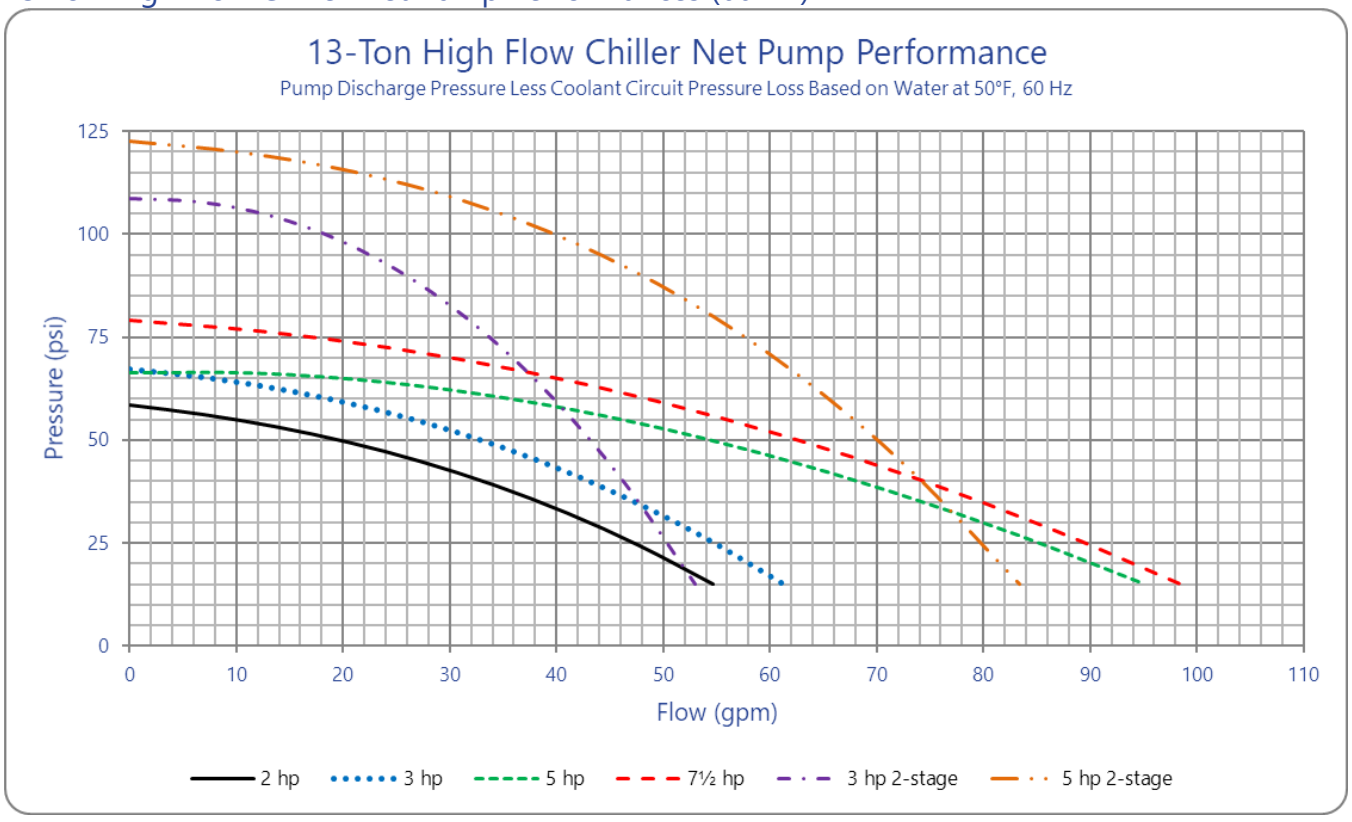
10 Ton High Flow Chiller Net Pump Performances (60 Hz)



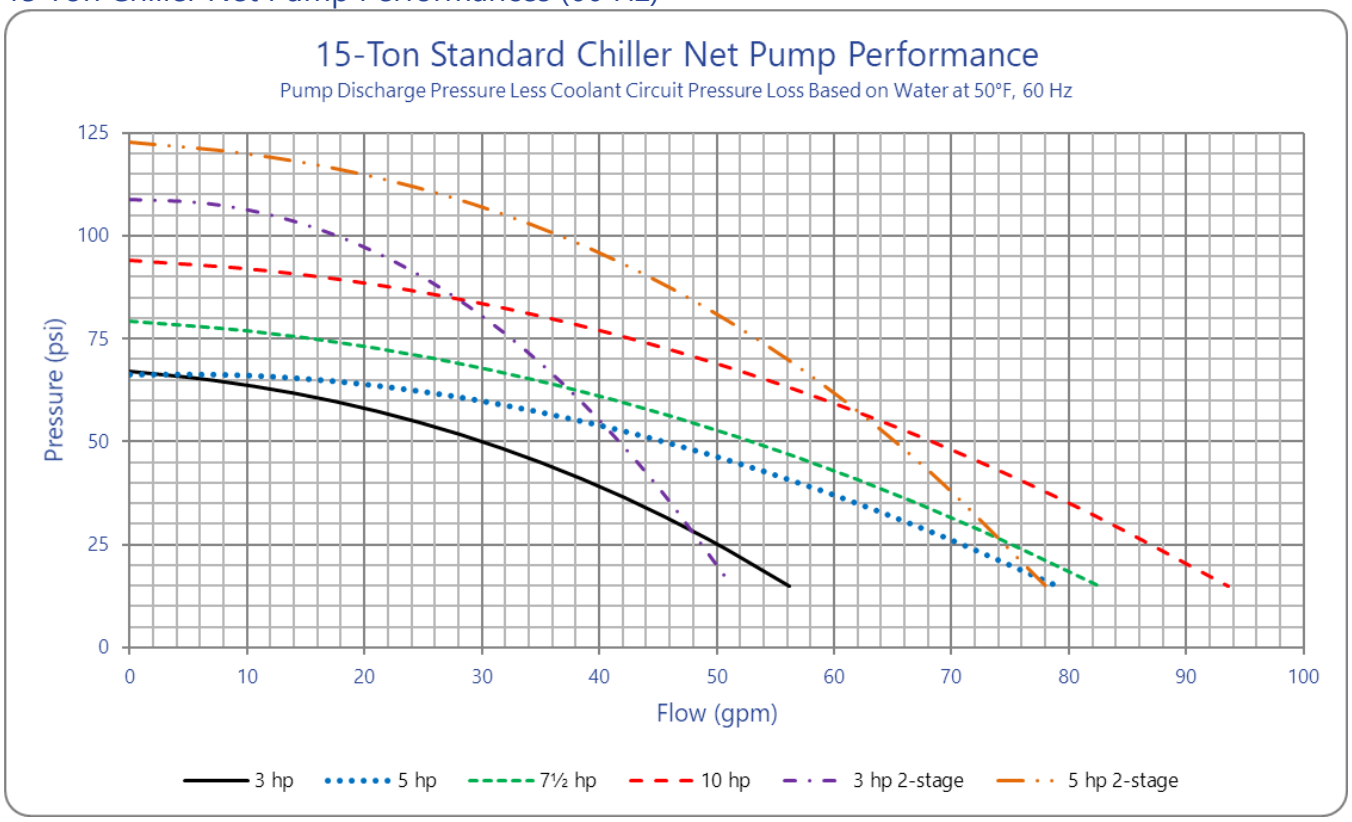
13 Ton Chiller Net Pump Performances (60 Hz)



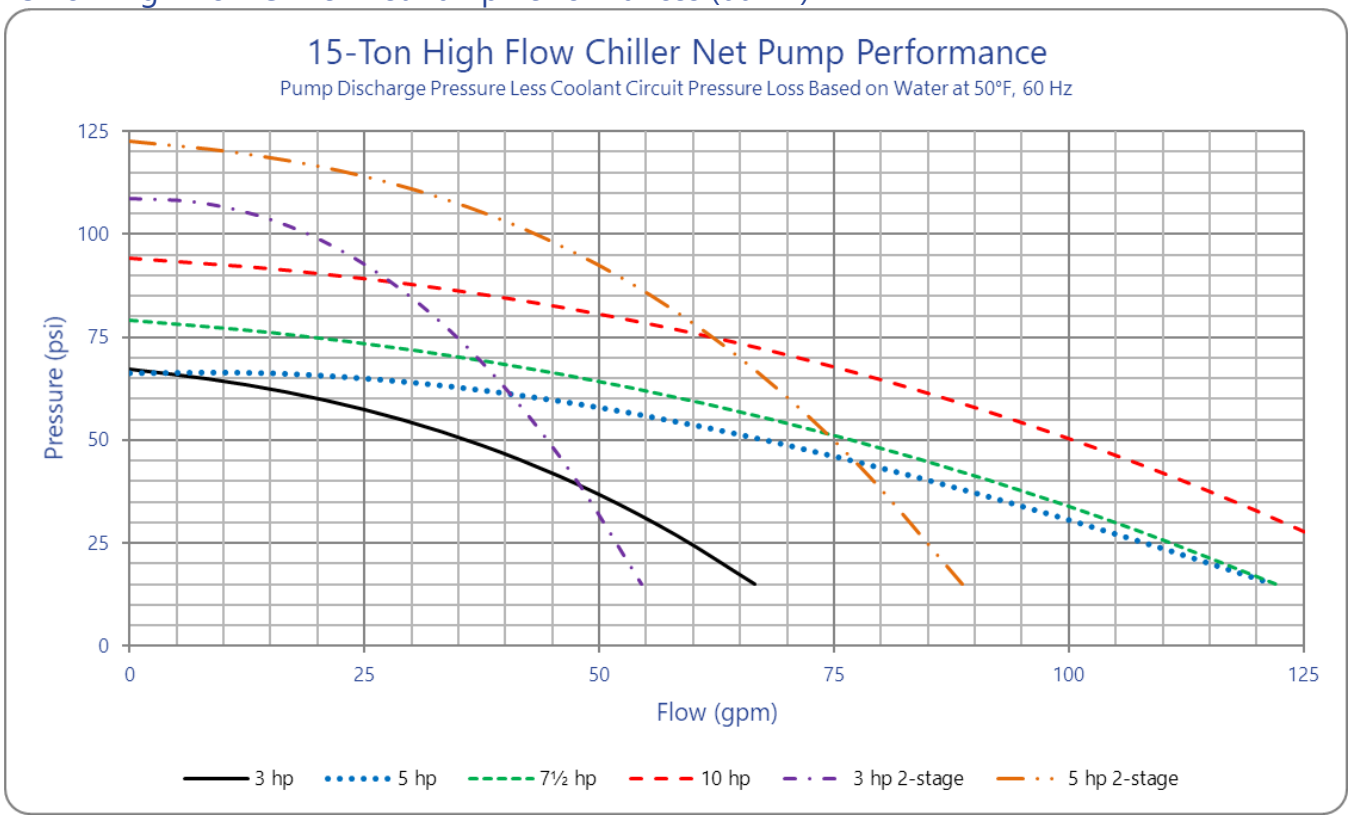
13 Ton High Flow Chiller Net Pump Performances (60 Hz)



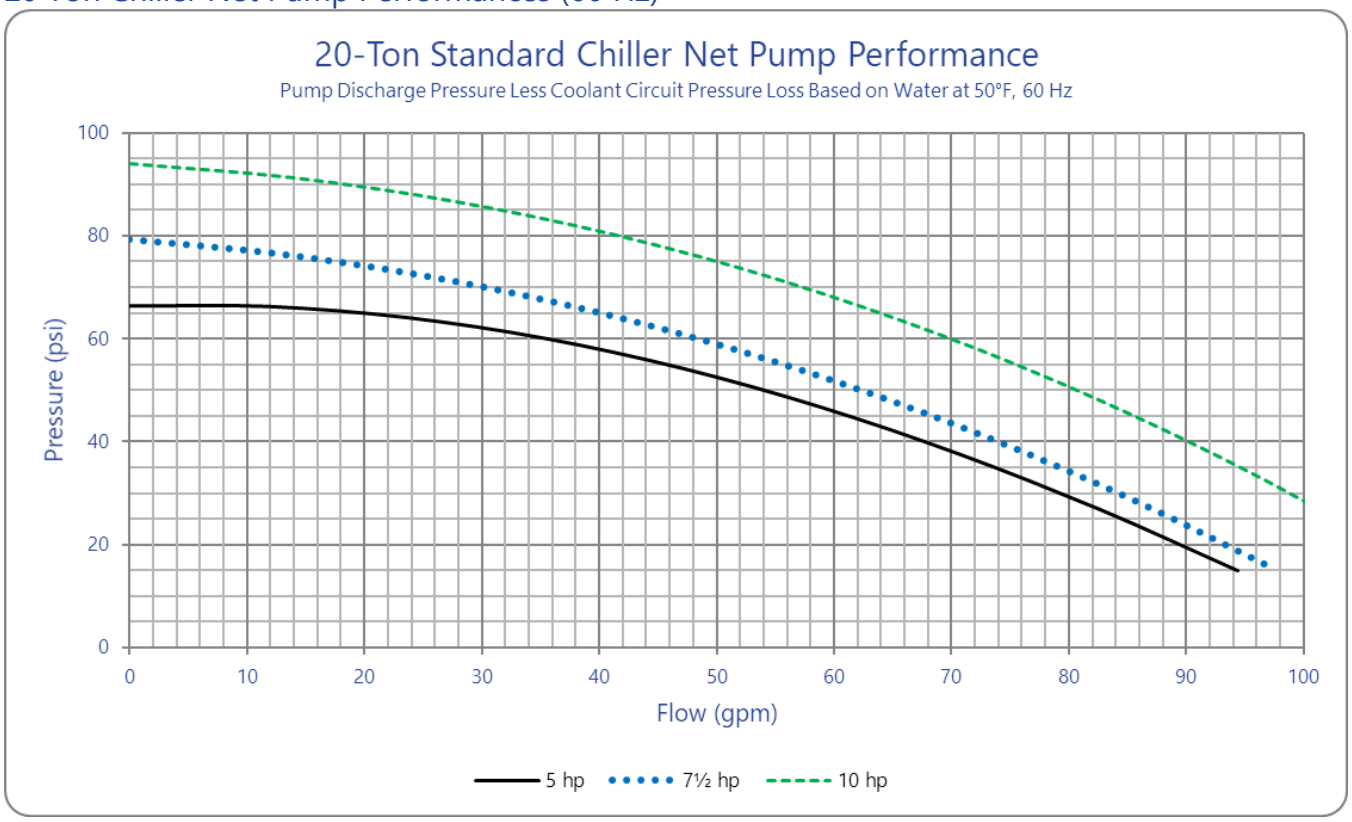
15 Ton Chiller Net Pump Performances (60 Hz)



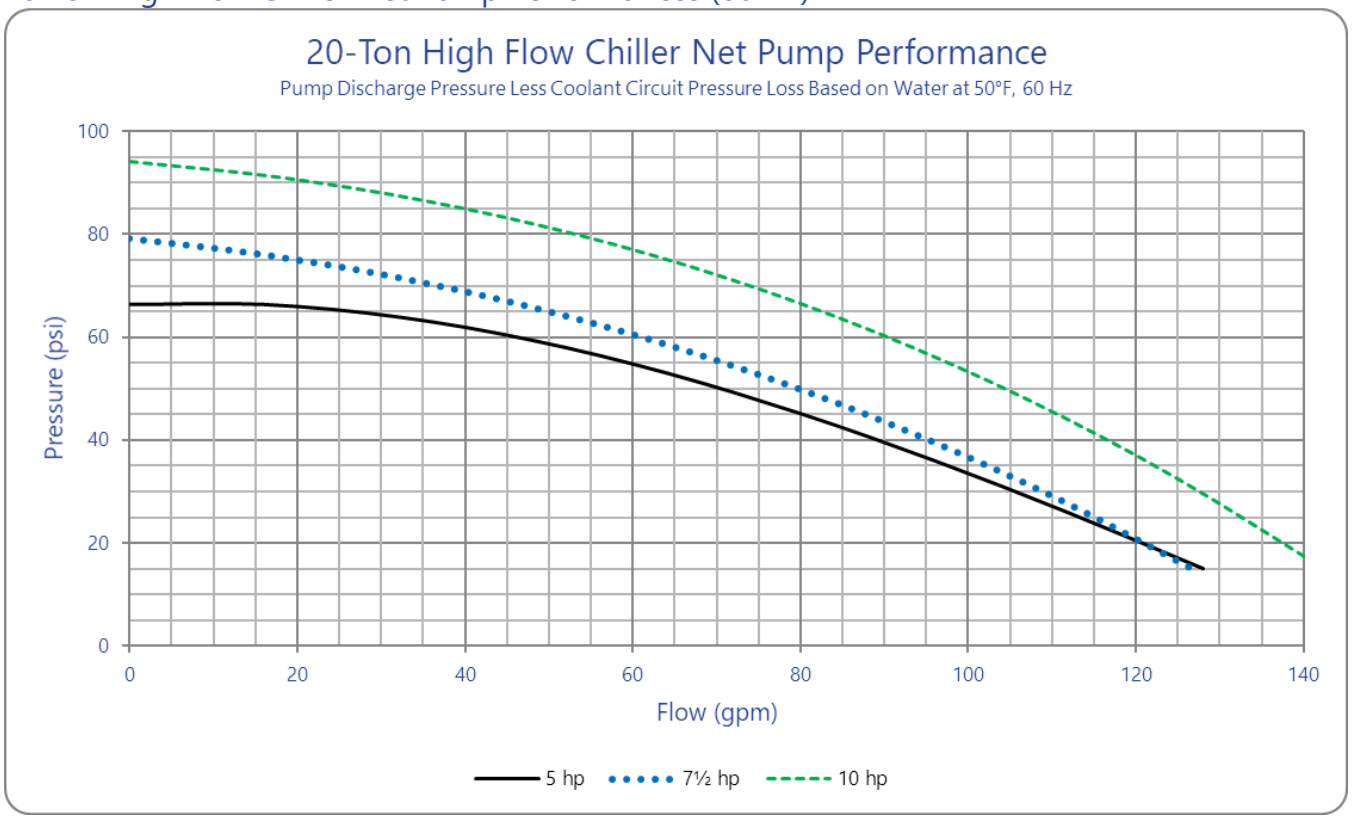
15 Ton High Flow Chiller Net Pump Performances (60 Hz)



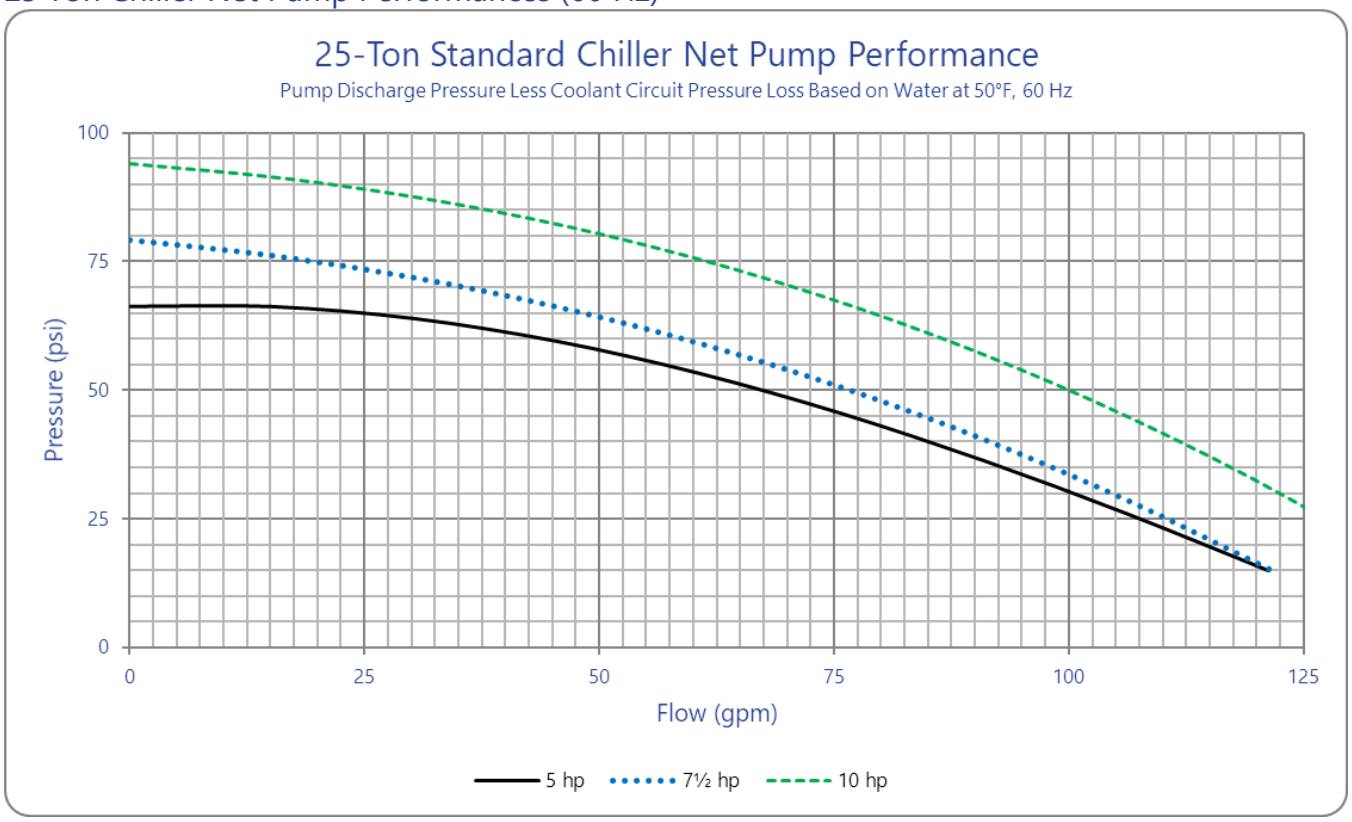
20 Ton Chiller Net Pump Performances (60 Hz)



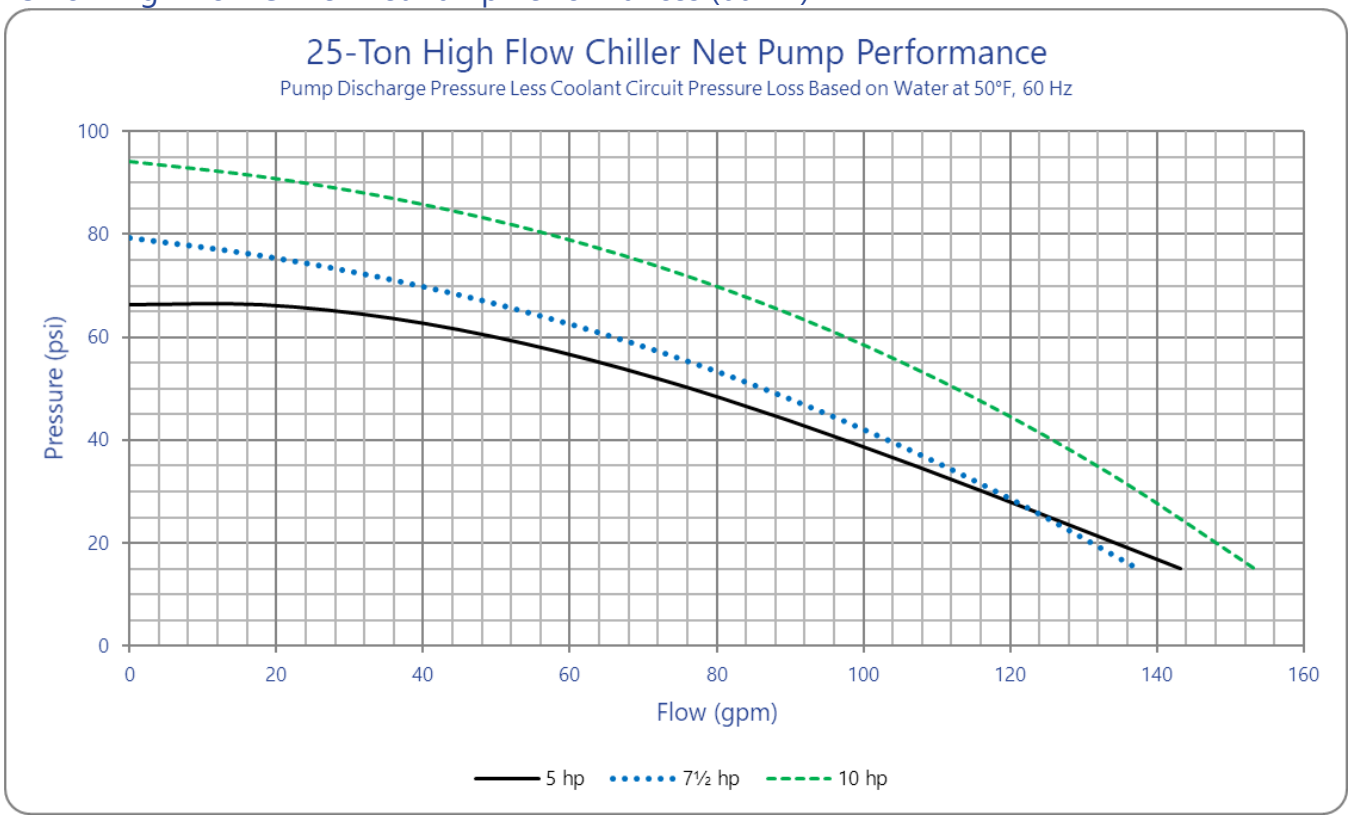
20 Ton High Flow Chiller Net Pump Performances (60 Hz)



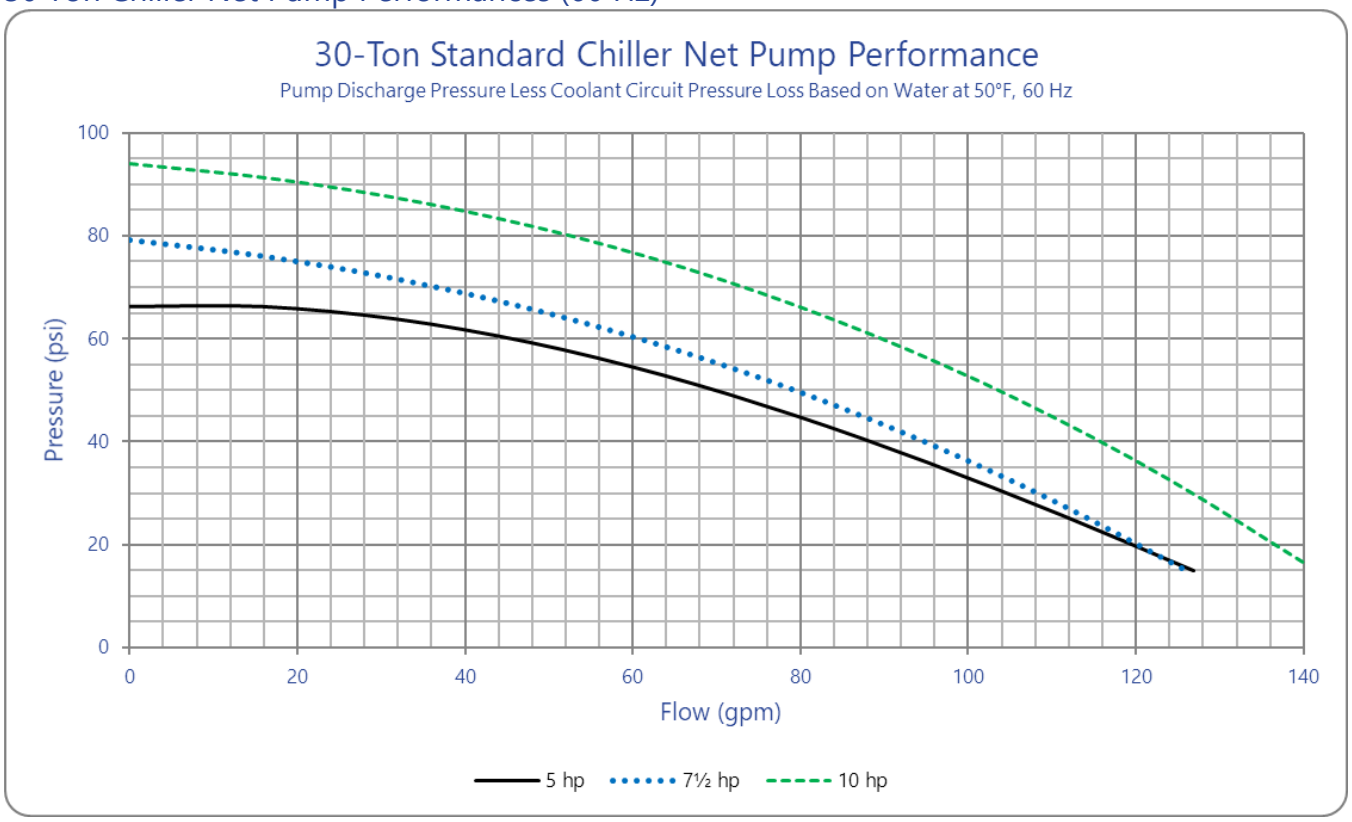
25 Ton Chiller Net Pump Performances (60 Hz)



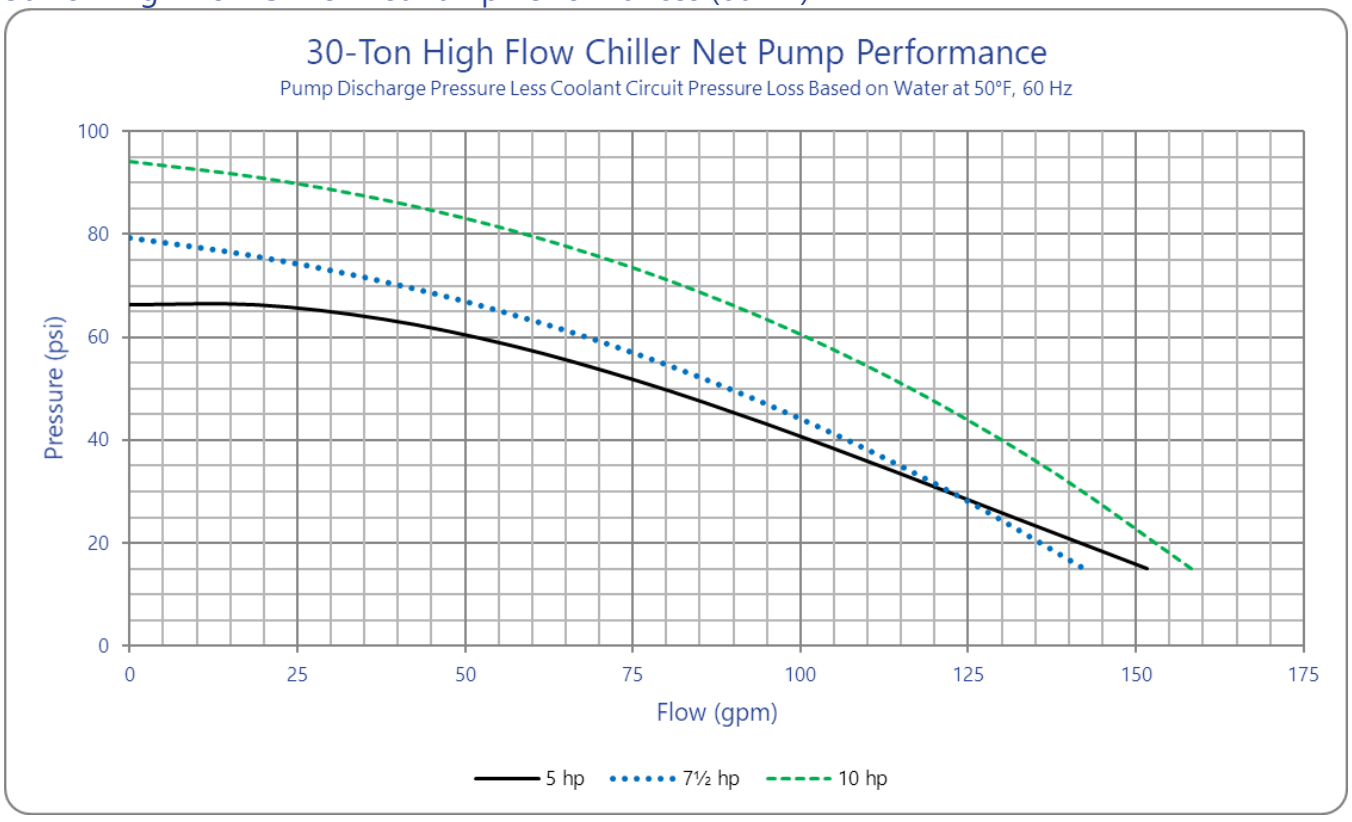
25 Ton High Flow Chiller Net Pump Performances (60 Hz)



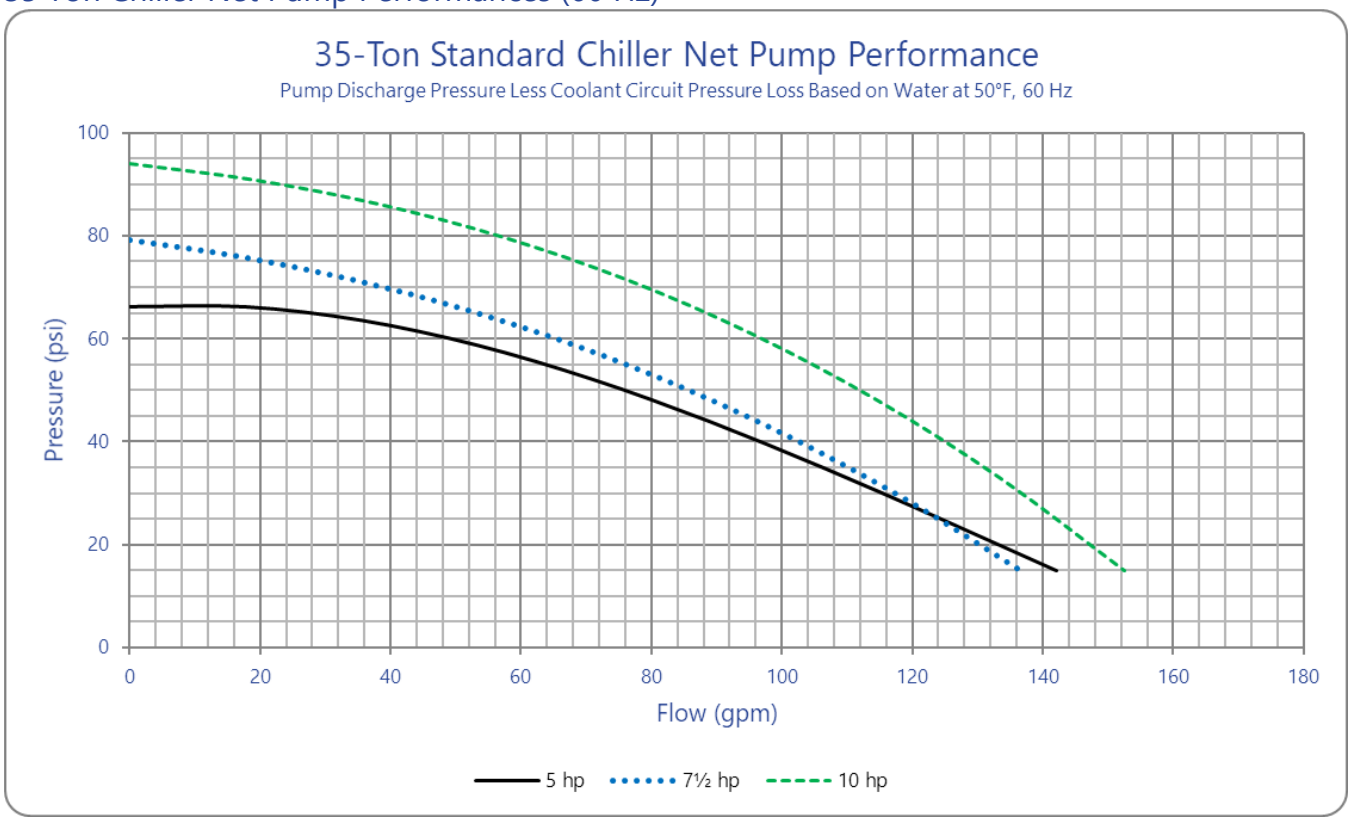
30 Ton Chiller Net Pump Performances (60 Hz)



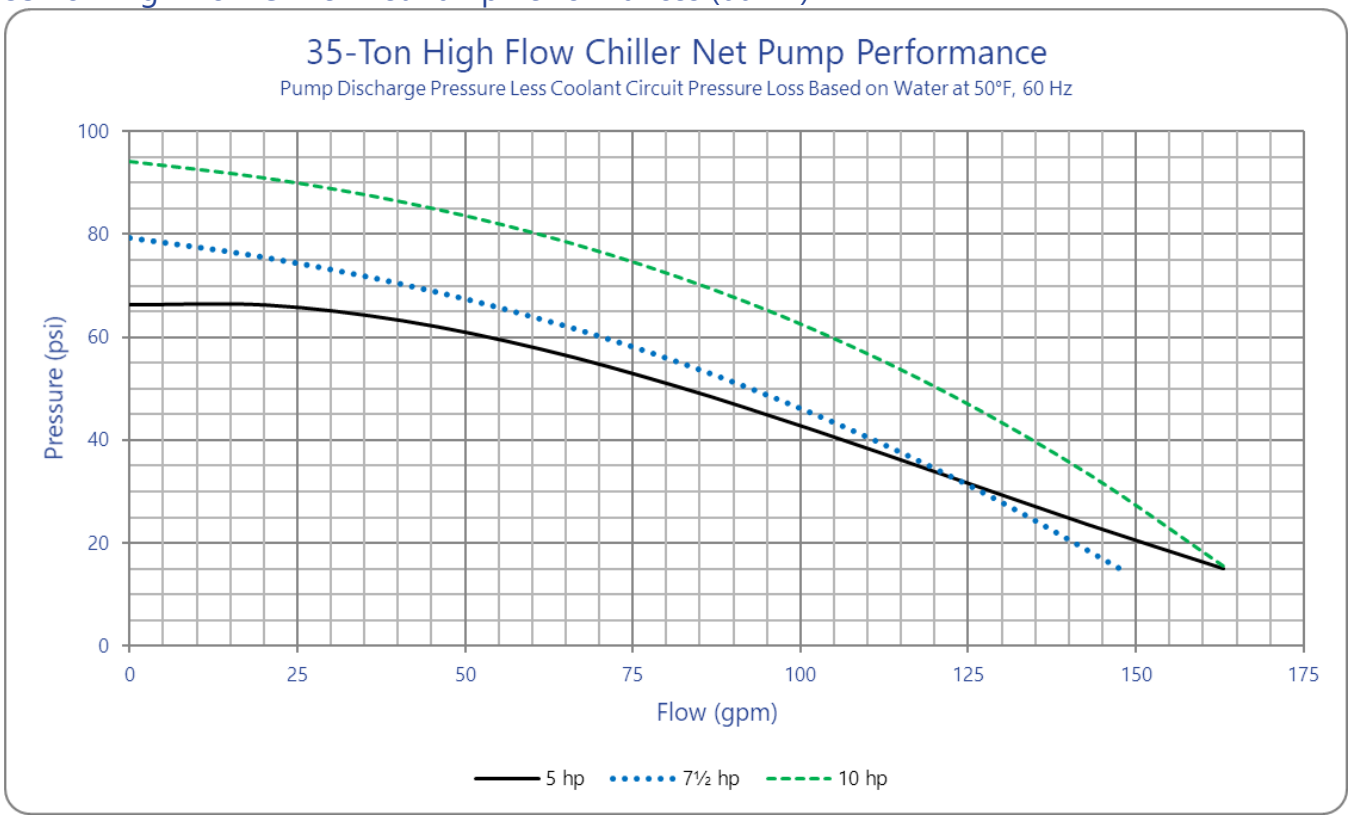
30 Ton High Flow Chiller Net Pump Performances (60 Hz)



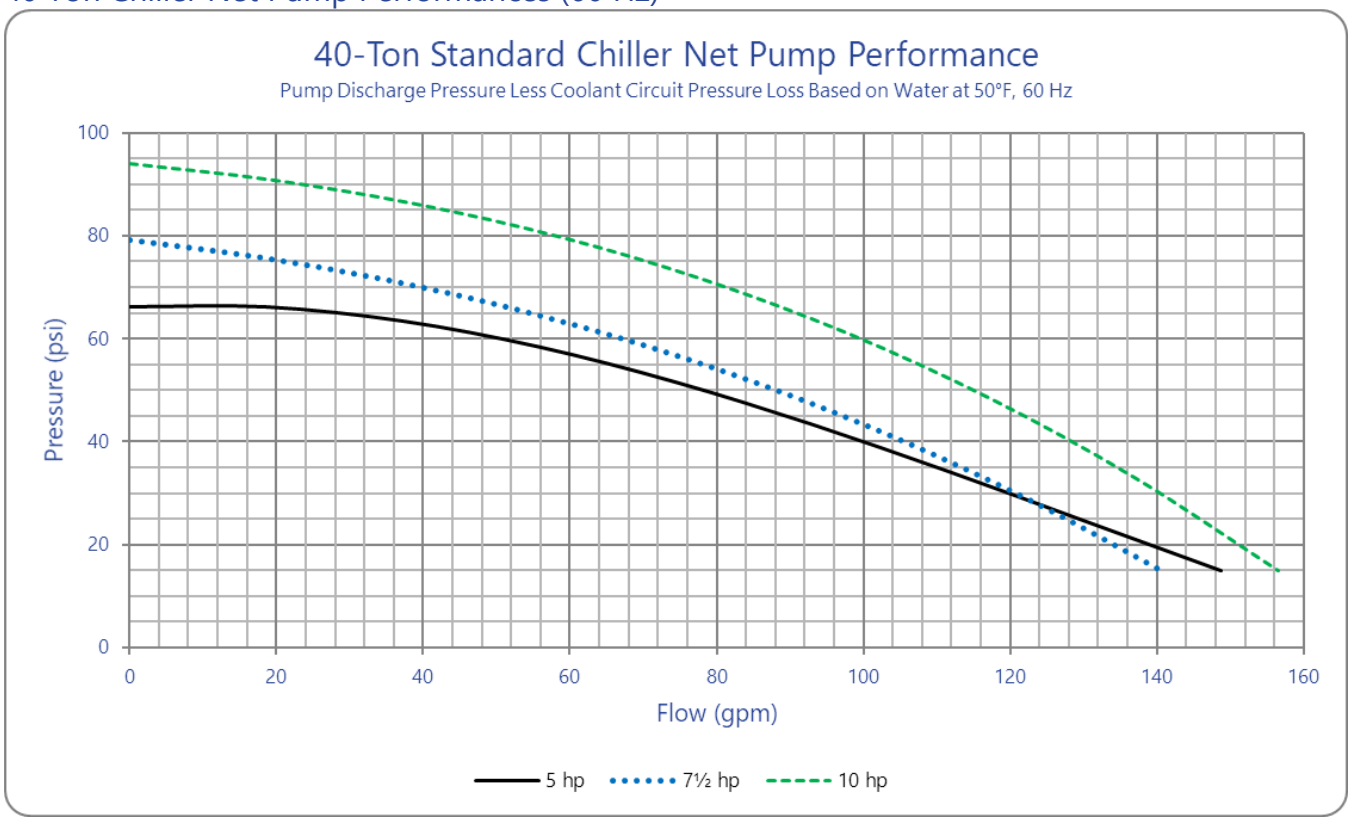
35 Ton Chiller Net Pump Performances (60 Hz)



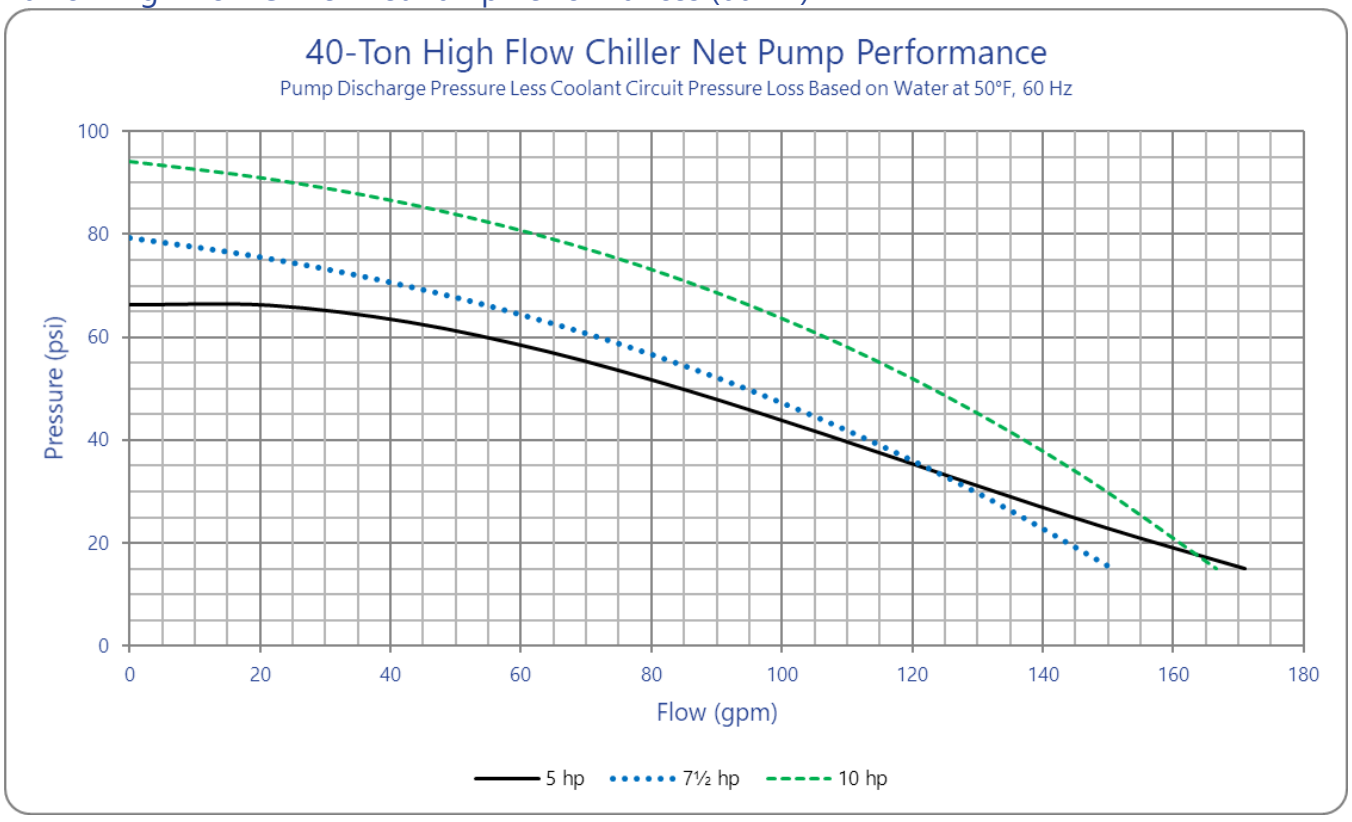
35 Ton High Flow Chiller Net Pump Performances (60 Hz)



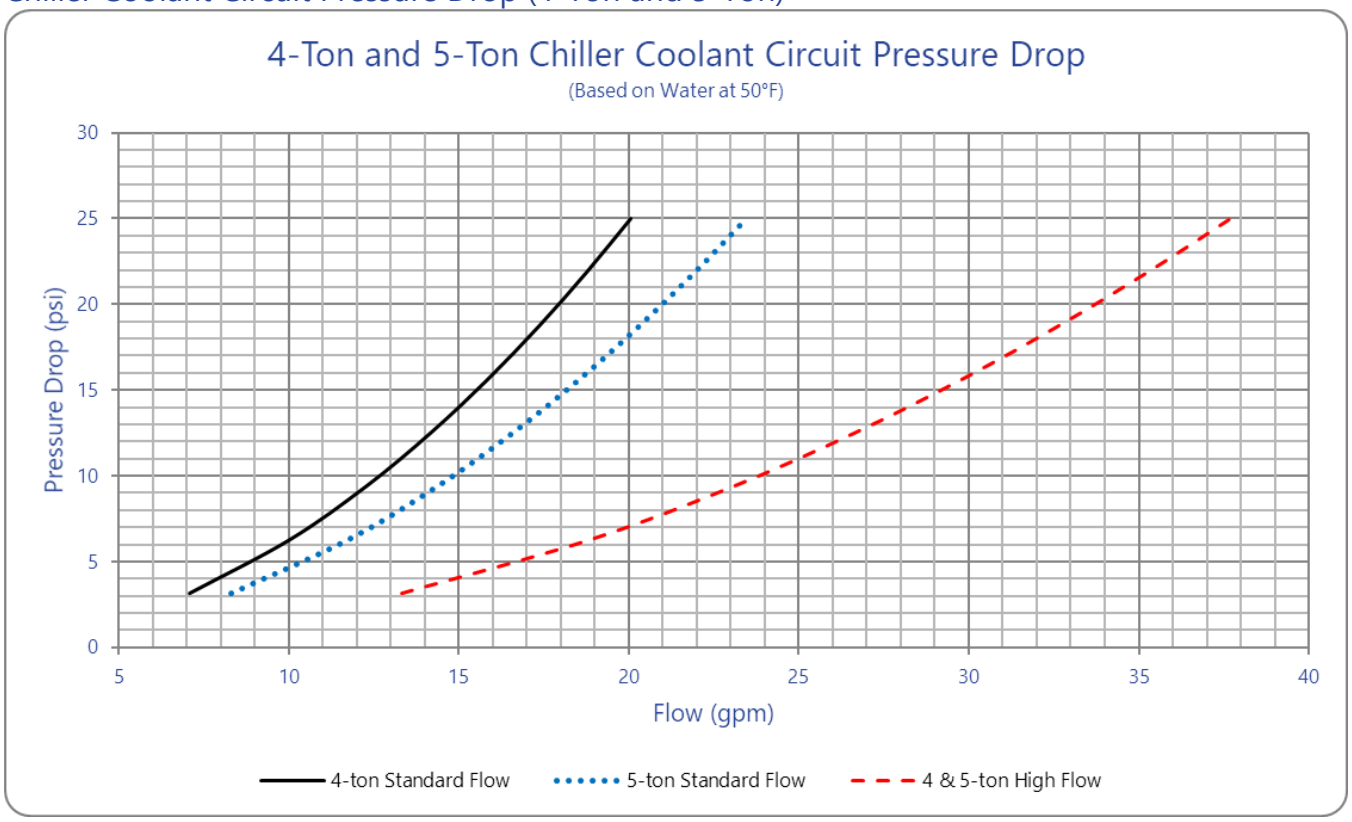
40 Ton Chiller Net Pump Performances (60 Hz)



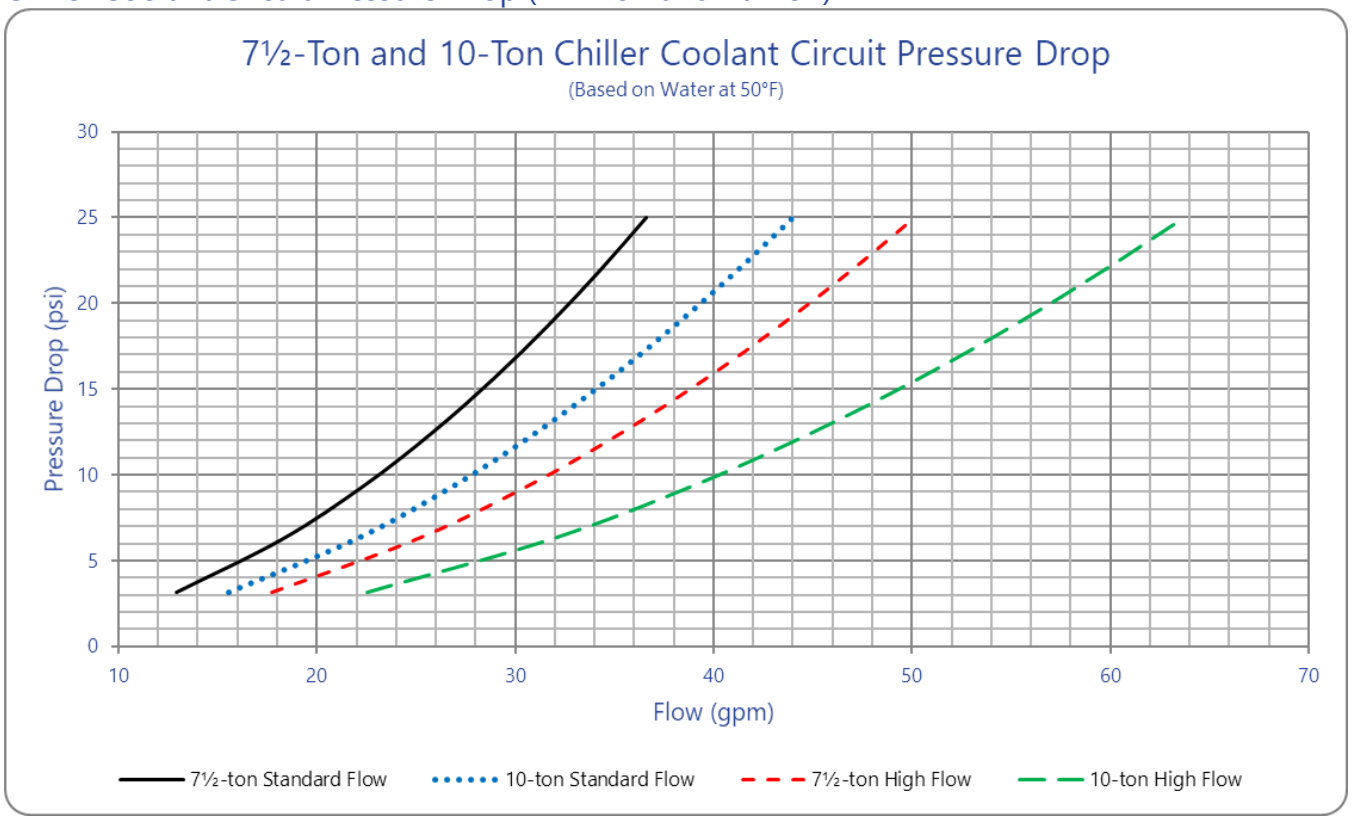
40 Ton High Flow Chiller Net Pump Performances (60 Hz)



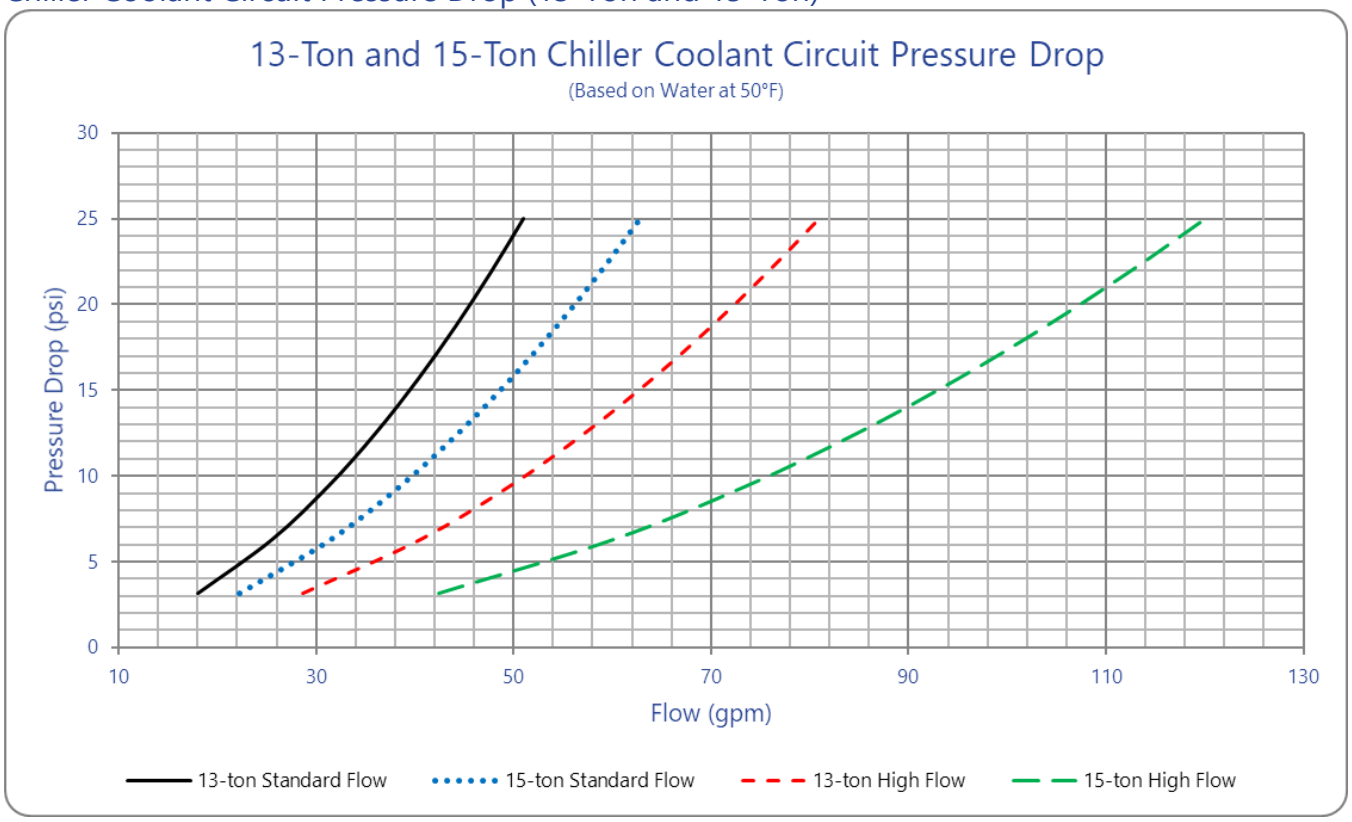
Chiller Coolant Circuit Pressure Drop (4-Ton and 5-Ton)



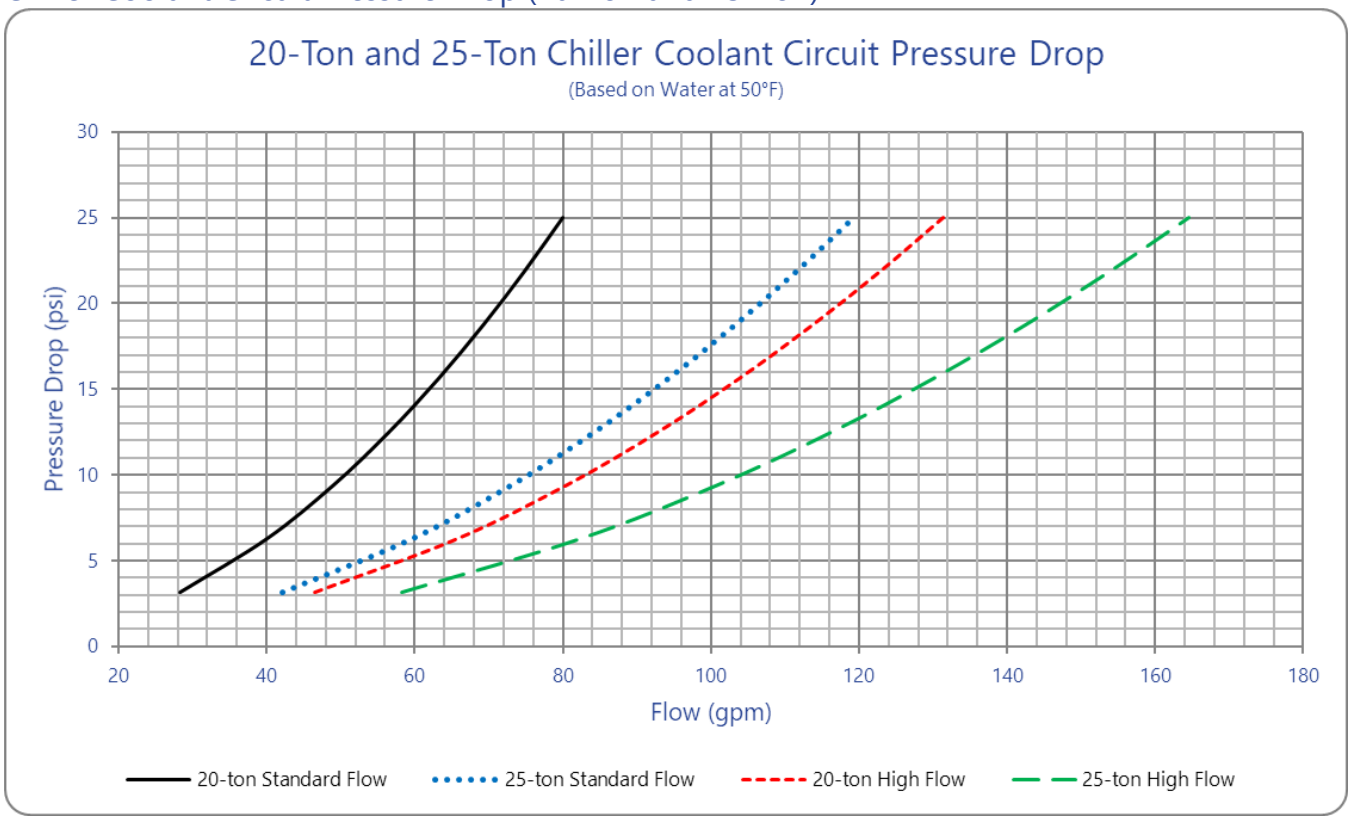
Chiller Coolant Circuit Pressure Drop (7½-Ton and 10-Ton)



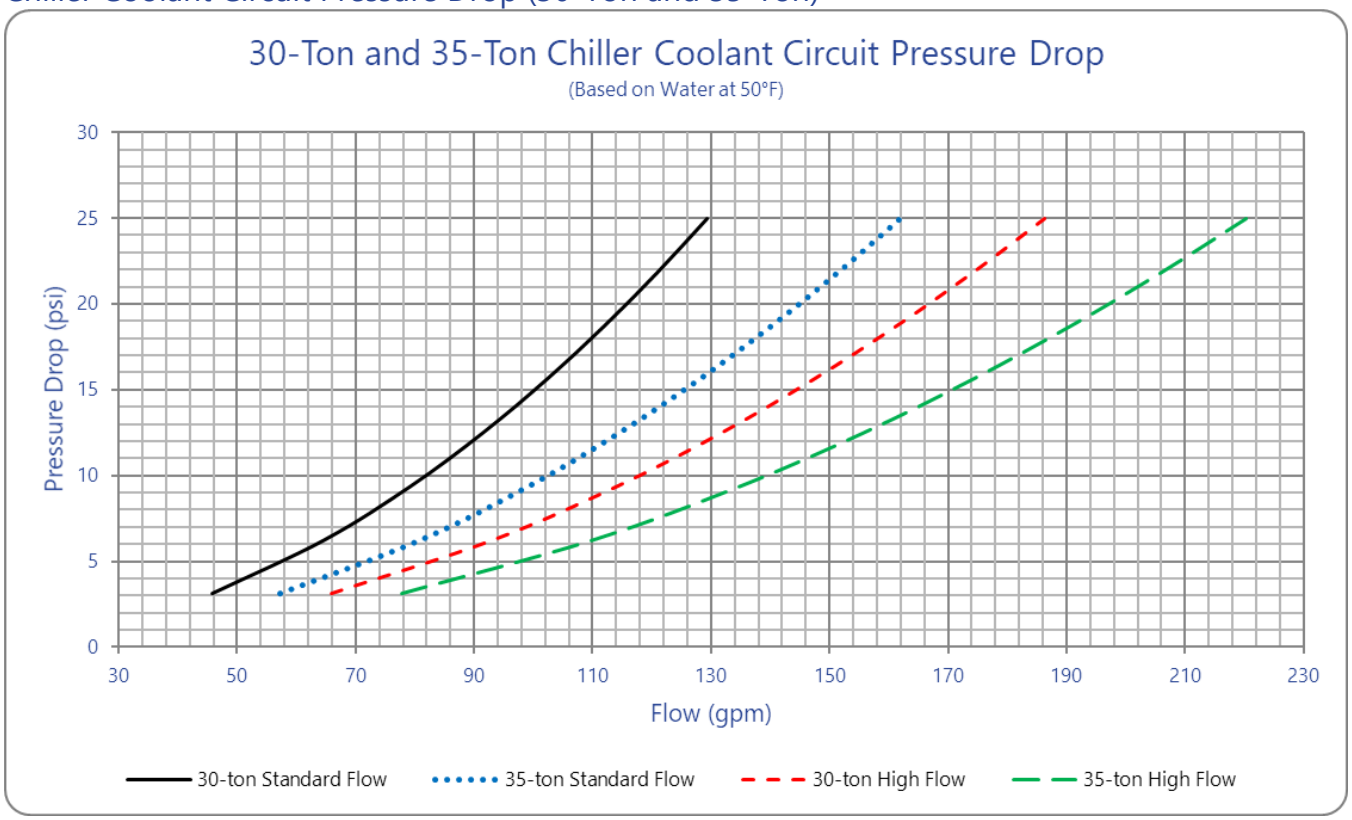
Chiller Coolant Circuit Pressure Drop (13-Ton and 15-Ton)



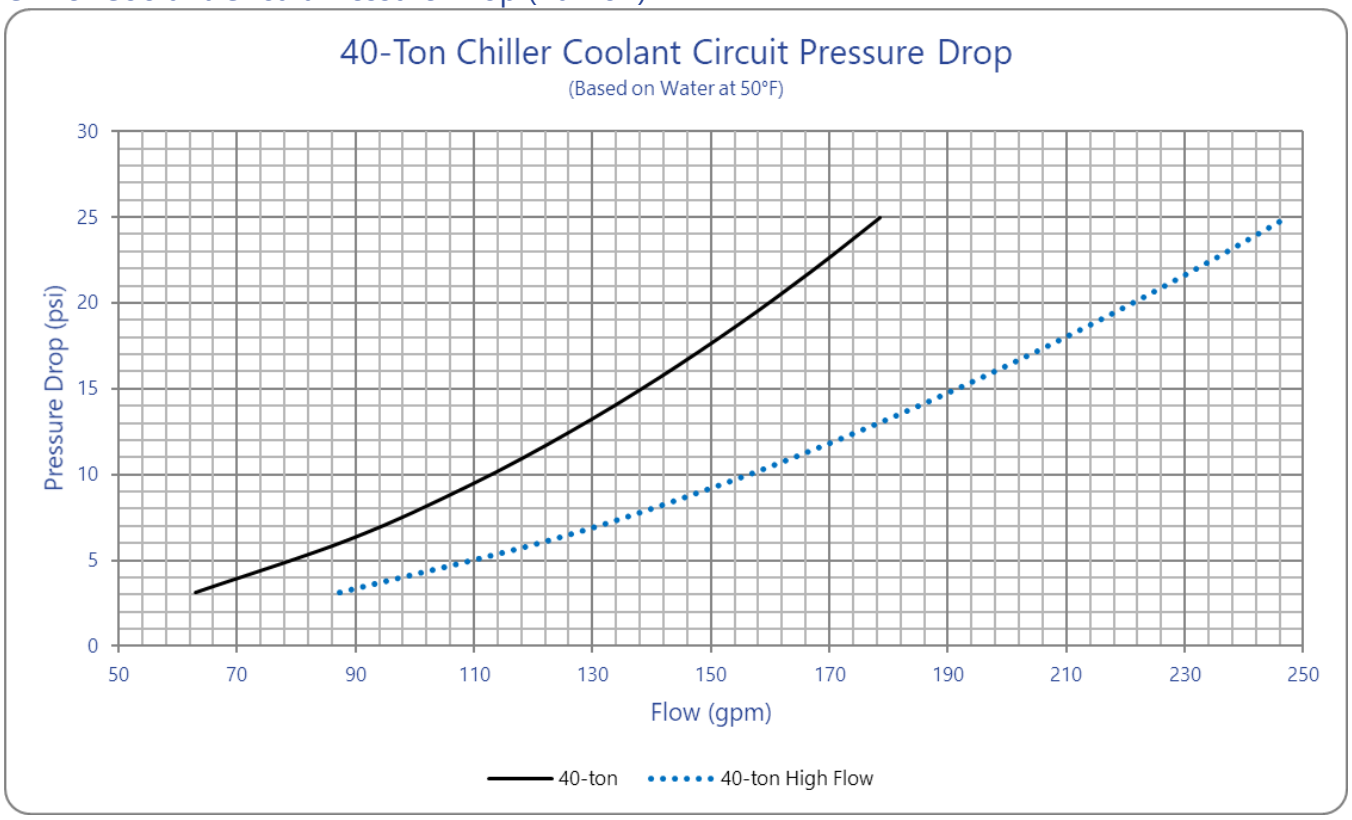
Chiller Coolant Circuit Pressure Drop (20-Ton and 25-Ton)



Chiller Coolant Circuit Pressure Drop (30-Ton and 35-Ton)



Chiller Coolant Circuit Pressure Drop (40-Ton)



Electrical Data

Air-Cooled Chiller Electrical Data

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQA04 with standard condenser fan	None	208/3/60	25	45	NQA04 with high pressure variable speed EC condenser fan option	None	208/3/60	25	45
	1.5		32	50		1.5		32	50
	2		33	50		2		33	50
	3		36	60		3		36	60
	5		42	60		5		42	60
	None	230/3/60	25	45		None	230/3/60	25	45
	1.5		31	50		1.5		31	50
	2		32	50		2		32	50
	3		35	60		3		35	60
	5		41	60		5		41	60
	None	460/3/60	13	25		None	460/3/60	13	25
	1.5		16	25		1.5		16	25
	2		16	25		2		16	25
	3		18	30		3		17	30
	5		20	30		5		20	30
	None	575/3/60	10	20		None	575/3/60	9	20
	1.5		12	20		1.5		12	20
	2		12	20		2		12	20
	3		13	20		3		13	20
	5		16	25		5		16	25
	None	400/3/50	13	25		None	400/3/50	13	25
	1.5		16	25		1.5		16	25
	2		16	25		2		16	25
	3		18	30		3		17	30
	5		20	30		5		20	30
NQA05 with standard condenser fan	None	208/3/60	29	50	NQA05 with high pressure variable speed EC condenser fan option	None	208/3/60	29	50
	1.5		36	60		1.5		36	60
	2		37	60		2		37	60
	3		40	60		3		40	60
	5		46	70		5		46	70
	None	230/3/60	29	50		None	230/3/60	29	50
	1.5		35	60		1.5		35	60
	2		36	60		2		36	60
	3		39	60		3		39	60
	5		44	70		5		44	70
	None	460/3/60	15	25		None	460/3/60	15	25
	1.5		18	30		1.5		18	30
	2		19	30		2		18	30
	3		20	30		3		20	30
	5		23	35		5		23	35
	None	575/3/60	12	20		None	575/3/60	11	20
	1.5		14	25		1.5		14	25
	2		14	25		2		14	25
	3		16	25		3		15	25
	5		18	30		5		18	25
	None	400/3/50	15	25		None	400/3/50	15	25
	1.5		18	30		1.5		18	30
	2		19	30		2		18	30
	3		20	30		3		20	30
	5		23	35		5		23	35

[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.

Air-Cooled Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data MCA[2]	Unit Data MOP[3]
NQA05 with variable-speed compressor option and standard condenser fan	None, 1.5, 2, 3, 5	208/3/60	Variable-speed option for the NQA05 only available for 460/3/60	
	None, 1.5, 2, 3, 5	230/3/60		
	None	460/3/60	19	35
	1.5		22	40
	2		23	40
	3		24	40
	5		27	40
	None, 1.5, 2, 3, 5	575/3/60	Variable-speed option for the NQA05 only available for 460/3/60	
	None, 1.5, 2, 3, 5	400/3/50		
NQA05 with variable-speed compressor and high pressure variable speed EC condenser fan options	None, 1.5, 2, 3, 5	208/3/60	Variable-speed option for the NQA05 only available for 460/3/60	
	None, 1.5, 2, 3, 5	230/3/60		
	None	460/3/60	19	35
	1.5		22	40
	2		22	40
	3		24	40
	5		27	40
	None, 1.5, 2, 3, 5	575/3/60	Variable-speed option for the NQA05 only available for 460/3/60	
	None, 1.5, 2, 3, 5	400/3/50		
NQA08 with standard condenser fans	None	208/3/60	45	80
	1.5		52	90
	2		53	90
	3		56	90
	5		62	100
	7.5		69	100
	None	230/3/60	45	80
	1.5		51	90
	2		52	90
	3		55	90
	5		60	90
	7.5		67	100
	None	460/3/60	23	40
	1.5		26	45
	2		27	45
	3		28	45
	5		31	50
	7.5		34	50
	None	575/3/60	19	35
	1.5		21	35
	2		22	35
	3		23	40
	5		25	40
	7.5		28	45
	None	400/3/50	23	40
	1.5		26	45
	2		27	45
	3		28	45
	5		31	50
	7.5		34	50
NQA08 with high pressure variable speed EC condenser fan option	None	208/3/60	45	80
	1.5		52	90
	2		52	90
	3		56	90
	5		62	100
	7.5		69	100
	None	230/3/60	45	80
	1.5		51	90
	2		52	90
	3		55	90
	5		60	90
	7.5		67	100
	None	460/3/60	23	40
	1.5		26	45
	2		26	45
	3		28	45
	5		30	50
	7.5		34	50
	None	575/3/60	19	35
	1.5		21	35
	2		21	35
	3		23	35
	5		25	40
	7.5		28	40
	None	400/3/50	23	40
	1.5		26	45
	2		26	45
	3		28	45
	5		30	50
	7.5		34	50

[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.

Air-Cooled Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQA10 with standard condenser fans	None	208/3/60	68	125	NQA10 with high pressure variable speed EC condenser fan option	None	208/3/60	68	125
	2		76	125		2		76	125
	3		79	150		3		79	150
	5		85	150		5		85	150
	7.5		93	150		7.5		92	150
	None	230/3/60	68	125		None	230/3/60	68	125
	2		75	125		2		75	125
	3		78	150		3		78	150
	5		84	150		5		83	150
	7.5		90	150		7.5		90	150
	None	460/3/60	28	50		None	460/3/60	28	50
	2		31	60		2		31	50
	3		33	60		3		32	60
	5		36	60		5		35	60
	7.5		39	60		7.5		39	60
	None	575/3/60	22	40		None	575/3/60	22	40
	2		25	40		2		25	40
	3		26	45		3		26	45
	5		28	45		5		28	45
	7.5		31	50		7.5		31	50
	None	400/3/50	28	50		None	400/3/50	28	50
	2		32	60		2		31	50
	3		33	60		3		32	60
	5		36	60		5		35	60
	7.5		39	60		7.5		39	60
NQA10 with standard condenser fans and variable-speed compressor option	None	208/3/60	78	150	NQA10 with high pressure variable speed EC condenser fan and variable-speed compressor options	None	208/3/60	78	150
	2		86	150		2		86	150
	3		89	150		3		89	150
	5		95	175		5		95	175
	7.5		103	175		7.5		102	175
	None	230/3/60	78	150		None	230/3/60	78	150
	2		85	150		2		85	150
	3		88	150		3		88	150
	5		94	150		5		93	150
	7.5		100	175		7.5		100	175
	None	460/3/60	42	80		None	460/3/60	42	80
	2		46	80		2		45	80
	3		47	80		3		47	80
	5		50	80		5		50	80
	7.5		53	90		7.5		53	90
	None	575/3/60	40	70		None	575/3/60	40	70
	2		43	80		2		42	80
	3		44	80		3		44	80
	5		46	80		5		46	80
	7.5		49	80		7.5		49	80
	None	400/3/50	43	80		None	400/3/50	42	80
	2		46	80		2		45	80
	3		47	80		3		47	80
	5		50	90		5		50	80
	7.5		54	90		7.5		53	90

[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.

Air-Cooled Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQA13 with standard condenser fans	None	208/3/60	72	125	NQA13 with high pressure variable speed EC condenser fan option	None	208/3/60	72	125
	2		80	150		2		80	150
	3		83	150		3		83	150
	5		89	150		5		89	150
	7.5		97	150		7.5		96	150
	None	230/3/60	72	125		None	230/3/60	72	125
	2		79	150		2		79	150
	3		82	150		3		82	150
	5		88	150		5		87	150
	7.5		94	150		7.5		94	150
	None	460/3/60	34	60		None	460/3/60	33	60
	2		37	70		2		37	60
	3		38	70		3		38	70
	5		41	70		5		41	70
	7.5		45	70		7.5		44	70
	None	575/3/60	29	50		None	575/3/60	28	50
	2		31	60		2		31	60
	3		33	60		3		32	60
	5		35	60		5		34	60
	7.5		38	60		7.5		37	60
	None	400/3/50	32	60		None	400/3/50	32	60
	2		36	60		2		35	60
	3		37	60		3		36	60
	5		40	70		5		39	70
	7.5		43	70		7.5		43	70
NQA15 with standard condenser fan	None	208/3/60	81	150	NQA15 with high pressure variable speed EC condenser fan option	None	208/3/60	83	150
	3		91	150		3		94	150
	5		97	175		5		100	175
	7.5		105	175		7.5		107	175
	10		111	175		10		114	175
	None	230/3/60	81	150		None	230/3/60	83	150
	3		90	150		3		93	150
	5		96	175		5		98	175
	7.5		103	175		7.5		105	175
	10		109	175		10		111	175
	None	460/3/60	39	70		None	460/3/60	41	70
	3		44	80		3		46	80
	5		47	80		5		48	80
	7.5		50	80		7.5		52	80
	10		53	90		10		55	90
	None	575/3/60	34	60		None	575/3/60	35	60
	3		38	70		3		39	70
	5		40	70		5		41	70
	7.5		43	70		7.5		44	70
	10		45	70		10		46	80
	None	400/3/50	36	70		None	400/3/50	38	70
	3		41	70		3		43	70
	5		44	70		5		46	80
	7.5		47	80		7.5		49	80
	10		50	80		10		52	80

[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.

Air-Cooled Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQA15 with standard condenser fan and variable-speed compressor option	None	208/3/60	116	200	NQA15 with high pressure variable speed EC condenser fan and variable-speed compressor options	None	208/3/60	119	225
	3		126	225		3		129	225
	5		133	225		5		135	225
	7.5		140	225		7.5		143	250
	10		147	250		10		149	250
	None	230/3/60	116	200		None	230/3/60	119	225
	3		125	225		3		128	225
	5		131	225		5		134	225
	7.5		138	225		7.5		141	225
	10		144	250		10		147	250
	None	460/3/60	81	150		None	460/3/60	82	150
	3		86	150		3		87	150
	5		88	150		5		90	150
	7.5		92	175		7.5		93	175
	10		95	175		10		96	175
	None	575/3/60	63	125		None	575/3/60	65	125
	3		67	125		3		68	125
	5		69	125		5		71	125
	7.5		72	125		7.5		74	125
	10		74	125		10		76	125
	None	400/3/50	80	150		None	400/3/50	82	150
	3		85	150		3		87	150
	5		87	150		5		90	150
	7.5		91	175		7.5		93	175
	10		94	175		10		96	175
NQA20 with standard condenser fans	None	208/3/60	94	150	NQA20 with high pressure variable speed EC condenser fan option	None	208/3/60	99	150
	5		111	150		5		116	150
	7.5		118	175		7.5		124	175
	10		125	175		10		130	175
	None	230/3/60	94	150		None	230/3/60	99	150
	5		109	150		5		115	150
	7.5		116	150		7.5		121	175
	10		122	175		10		127	175
	None	460/3/60	51	70		None	460/3/60	53	80
	5		58	80		5		61	80
	7.5		62	80		7.5		64	90
	10		65	90		10		67	90
	None	575/3/60	37	50		None	575/3/60	39	60
	5		43	60		5		45	60
	7.5		46	60		7.5		48	70
	10		48	70		10		50	70
	None	400/3/50	48	70		None	400/3/50	53	80
	5		56	80		5		61	80
	7.5		59	80		7.5		64	90
	10		62	90		10		67	90

[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.

Air-Cooled Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQA20 with standard condenser fans and variable-speed compressor option	None	208/3/60	122	200	NQA20 with high pressure variable speed EC condenser fan and variable-speed compressor options	None	208/3/60	128	200
	5		139	200		5		145	225
	7.5		147	225		7.5		152	225
	10		153	225		10		159	225
	None	230/3/60	122	200		None	230/3/60	128	200
	5		138	200		5		143	200
	7.5		144	225		7.5		150	225
	10		150	225		10		156	225
	None	460/3/60	66	100		None	460/3/60	69	100
	5		73	110		5		76	110
	7.5		77	110		7.5		80	110
	10		80	110		10		83	125
	None	575/3/60	57	90		None	575/3/60	60	90
	5		63	100		5		66	100
	7.5		66	100		7.5		69	100
	10		68	100		10		71	100
	None	400/3/50	64	100		None	400/3/50	69	100
	5		71	110		5		76	110
	7.5		75	110		7.5		80	110
	10		78	110		10		83	125
NQA25 with standard condenser fans	None	208/3/60	135	200	NQA25 with high pressure variable speed EC condenser fan option	None	208/3/60	140	200
	5		151	225		5		157	225
	7.5		159	225		7.5		164	225
	10		165	225		10		171	225
	None	230/3/60	135	200		None	230/3/60	140	200
	5		150	225		5		155	225
	7.5		157	225		7.5		162	225
	10		163	225		10		168	225
	None	460/3/60	62	90		None	460/3/60	65	90
	5		70	100		5		73	100
	7.5		73	100		7.5		76	100
	10		76	100		10		79	110
	None	575/3/60	53	80		None	575/3/60	55	80
	5		59	80		5		61	90
	7.5		62	90		7.5		64	90
	10		64	90		10		66	90
	None	400/3/50	57	80		None	400/3/50	62	90
	5		65	90		5		70	100
	7.5		68	100		7.5		73	100
	10		71	100		10		76	100

[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.

Air-Cooled Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQA30 with standard condenser fans	None	208/3/60	153	225	NQA30 with high pressure variable speed EC condenser fan option	None	208/3/60	161	225
	5		170	250		5		178	250
	7.5		177	250		7.5		185	250
	10		184	250		10		192	250
	None	230/3/60	153	225		None	230/3/60	161	225
	5		168	225		5		176	250
	7.5		175	250		7.5		183	250
	10		181	250		10		189	250
	None	460/3/60	76	110		None	460/3/60	80	110
	5		83	125		5		87	125
	7.5		87	125		7.5		91	125
	10		90	125		10		94	125
	None	575/3/60	65	90		None	575/3/60	69	100
	5		71	100		5		75	100
	7.5		74	100		7.5		78	110
	10		76	110		10		80	110
	None	400/3/50	68	100		None	400/3/50	75	110
	5		76	110		5		83	110
	7.5		79	110		7.5		86	125
	10		82	110		10		89	125

[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.

Water-Cooled & Remote Air-Cooled Condenser Chiller Electrical Data

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQW05 & NQR05	None	208/3/60	26	50	NQW05 with variable speed-compressor option	None	208/3/60	Variable-speed option for the NQW05 only available for 460/3/60	
	1.5		33	60		1.5			
	2		34	60		2			
	3		37	60		3			
	5		43	70		5			
	None	230/3/60	26	50		None	230/3/60		
	1.5		32	60		1.5			
	2		33	60		2			
	3		36	60		3			
	5		41	70		5			
	None	460/3/60	13	25		None	460/3/60	17	35
	1.5		16	30		1.5		20	35
	2		17	30		2		21	35
	3		18	30		3		22	40
	5		21	35		5		25	40
	None	575/3/60	10	20		None	575/3/60	Variable-speed option for the NQW05 only available for 460/3/60	
	1.5		13	20		1.5			
	2		13	25		2			
	3		14	25		3			
	5		16	25		5			
	None	400/3/50	13	25		None	400/3/50		
	1.5		16	30		1.5			
	2		17	30		2			
	3		18	30		3			
	5		21	35		5			
NQW08 & NQR08	None	208/3/60	39	70					
	1.5		46	80					
	2		47	80					
	3		50	80					
	5		56	90					
	7.5		64	100					
	None	230/3/60	39	70					
	1.5		45	80					
	2		46	80					
	3		49	80					
	5		55	90					
	7.5		61	100					
	None	460/3/60	20	35					
	1.5		23	40					
	2		23	40					
	3		24	40					
	5		27	45					
	7.5		31	50					
	None	575/3/60	16	30					
	1.5		19	35					
	2		19	35					
	3		20	35					
	5		22	35					
	7.5		25	40					
	None	400/3/50	20	35					
	1.5		23	40					
	2		23	40					
	3		24	40					
	5		27	45					
	7.5		31	50					

[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.

Water-Cooled & Remote Air-Cooled Condenser Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQW10 & NQR10	None	208/3/60	63	125	NQW10 with variable-speed compressor option	None	208/3/60	73	150
	2		70	125		2		80	150
	3		73	125		3		83	150
	5		79	150		5		89	150
	7.5		87	150		7.5		97	175
	None	230/3/60	63	125		None	230/3/60	73	150
	2		69	125		2		79	150
	3		72	125		3		82	150
	5		78	150		5		88	150
	7.5		85	150		7.5		95	175
	None	460/3/60	24	45		None	460/3/60	39	70
	2		28	50		2		42	80
	3		29	50		3		44	80
	5		32	60		5		46	80
	7.5		35	60		7.5		50	80
	None	575/3/60	19	35		None	575/3/60	37	70
	2		22	40		2		40	70
	3		23	40		3		41	80
	5		25	45		5		43	80
	7.5		28	45		7.5		46	80
	None	400/3/50	24	45		None	400/3/50	39	70
	2		28	50		2		42	80
	3		29	50		3		44	80
	5		32	60		5		46	80
	7.5		35	60		7.5		50	80
NQW15 & NQR15	None	208/3/60	72	150	NQW15 & NQR15 with variable-speed compressor option	None	208/3/60	108	200
	3		83	150		3		118	225
	5		89	150		5		124	225
	7.5		96	175		7.5		132	225
	10		103	175		10		138	225
	None	230/3/60	72	150		None	230/3/60	108	200
	3		82	150		3		117	225
	5		87	150		5		123	225
	7.5		94	175		7.5		130	225
	10		100	175		10		136	225
	None	460/3/60	35	70		None	460/3/60	76	150
	3		40	70		3		81	150
	5		42	70		5		84	150
	7.5		46	80		7.5		87	150
	10		49	80		10		90	175
	None	575/3/60	31	60		None	575/3/60	60	110
	3		34	60		3		64	125
	5		37	70		5		66	125
	7.5		40	70		7.5		69	125
	10		42	70		10		71	125
	None	400/3/50	32	60		None	400/3/50	76	150
	3		37	70		3		81	150
	5		40	70		5		84	150
	7.5		43	70		7.5		87	150
	10		46	80		10		90	175

[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.

Water-Cooled & Remote Air-Cooled Condenser Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQW20 & NQR20	None	208/3/60	77	125	NQW20 with variable-speed compressor option	None	208/3/60	106	175
	5		94	150		5		123	200
	7.5		102	150		7.5		130	200
	10		108	150		10		137	200
	None	230/3/60	77	125		None	230/3/60	106	175
	5		93	150		5		121	200
	7.5		99	150		7.5		128	200
	10		105	150		10		134	200
	None	460/3/60	41	60		None	460/3/60	57	90
	5		49	70		5		64	100
	7.5		52	80		7.5		68	100
	10		55	80		10		71	110
	None	575/3/60	30	45		None	575/3/60	50	80
	5		36	50		5		56	90
	7.5		39	60		7.5		59	90
	10		41	60		10		61	90
	None	400/3/50	41	60		None	400/3/50	57	90
	5		49	70		5		64	100
	7.5		52	80		7.5		68	100
	10		55	80		10		71	110
NQW25 & NQR25	None	208/3/60	118	175	NQW30 & NQR30	None	208/3/60	128	200
	5		135	200		5		145	225
	7.5		142	200		7.5		152	225
	10		149	225		10		159	225
	None	230/3/60	118	175		None	230/3/60	128	200
	5		133	200		5		143	200
	7.5		140	200		7.5		150	225
	10		146	200		10		156	225
	None	460/3/60	53	80		None	460/3/60	62	90
	5		61	90		5		69	100
	7.5		64	90		7.5		73	100
	10		67	100		10		76	110
	None	575/3/60	46	70		None	575/3/60	54	80
	5		52	80		5		60	90
	7.5		55	80		7.5		63	90
	10		57	80		10		65	90
	None	400/3/50	50	80		None	400/3/50	57	90
	5		58	80		5		65	100
	7.5		61	90		7.5		68	100
	10		64	90		10		71	100

[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.

Water-Cooled & Remote Air-Cooled Condenser Chiller Electrical Data (continued)

Model	Process Pump (hp)	Rated Voltage	Unit Data		Model	Process Pump (hp)	Rated Voltage	Unit Data	
			MCA[2]	MOP[3]				MCA[2]	MOP[3]
NQW35 & NQR35	None	208/3/60	149	225	NQW40 & NQR40	None	208/3/60	165	250
	5		166	250		5		182	300
	7.5		173	250		7.5		190	300
	10		180	300		10		196	300
	None	230/3/60	149	225		None	230/3/60	165	250
	5		164	250		5		181	300
	7.5		171	250		7.5		187	300
	10		177	250		10		193	300
	None	460/3/60	67	100		None	460/3/60	71	110
	5		74	110		5		78	110
	7.5		78	110		7.5		82	125
	10		81	125		10		85	125
	None	575/3/60	56	90		None	575/3/60	57	90
	5		62	90		5		63	90
	7.5		65	90		7.5		66	100
	10		67	100		10		68	100
	None	400/3/50	65	100		None	400/3/50	71	110
	5		72	110		5		78	110
	7.5		76	110		7.5		82	125
	10		79	110		10		85	125

[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 Air-Cooled Condenser Electrical Data

Model	Chiller Used With	Rated Voltage	MCA[2]	MOP[3]
KCM009	NQR05	230	2.9	15
		460	1.4	15
		575	1.1	15
KCM011	NQR08	230	2.9	15
		460	1.4	15
		575	1.1	15
KCM014	NQR10	230	5.2	15
		460	2.6	15
		575	2	15
KCL023	NQR15	230	16	20
		460	7	15
		575	5.6	15
KCL030	NQR20	230	16	20
		460	7	15
		575	5.6	15
KCL037	NQR25	230	16	20
		460	7	15
		575	5.6	15
KCL045	NQR30	230	21.5	25
		460	10.1	15
		575	8.1	15
KCL054	NQR35	230	21.5	25
		460	10.1	15
		575	8.1	15
KCL056	NQR40	230	21.5	25
		460	10.1	15
		575	8.1	15

[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 devices.

Performance Data

NQA Series Air-Cooled Condenser Chiller Cooling Capacities - 60 Hz

Leaving Coolant Temp	Model	Condenser Entering 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	NQA04	2.5	3.6	7.0	2.5	3.6	7.0	2.5	3.7	6.9	2.5	4.0	7.0
	NQA05	3.1	4.2	8.6	3.1	4.3	8.5	2.9	4.6	8.2	2.9	4.9	8.2
	NQA08	4.5	6.2	12.6	4.5	6.2	12.6	4.5	6.4	12.5	4.5	6.8	12.5
	NQA10	6.7	9.0	18.6	6.6	9.3	18.3	6.3	9.9	17.5	6.3	10.6	17.6
	NQA13	7.8	10.2	21.8	7.6	10.8	21.1	7.3	11.4	20.3	7.3	12.1	20.4
	NQA15	9.1	11.9	25.4	9.0	12.2	25.1	8.7	12.9	24.1	8.7	13.8	24.2
	NQA20	12.2	16.3	34.2	12.3	16.3	34.3	11.8	17.4	32.8	11.6	18.7	32.4
	NQA25	15.6	20.5	43.4	15.5	20.9	43.1	14.9	22.1	41.6	14.8	23.5	41.3
	NQA30	18.3	23.9	51.0	18.3	24.1	51.0	17.7	25.5	49.3	17.5	27.1	48.8
25°F	NQA04	2.8	3.6	7.6	2.8	3.6	7.7	2.7	3.8	7.4	2.6	4.0	7.2
	NQA05	3.4	4.2	9.3	3.4	4.3	9.2	3.3	4.6	8.8	3.1	5.0	8.5
	NQA08	5.0	6.2	13.6	5.0	6.2	13.6	4.9	6.4	13.4	4.8	6.8	13.0
	NQA10	7.4	9.1	20.2	7.3	9.5	19.7	7.0	10.0	18.9	6.7	10.7	18.2
	NQA13	8.6	10.4	23.4	8.3	11.0	22.6	8.0	11.6	21.8	7.7	12.3	21.0
	NQA15	10.1	12.0	27.5	9.9	12.5	26.9	9.6	13.2	26.0	9.2	14.0	25.0
	NQA20	13.7	16.2	37.2	13.7	16.5	37.1	13.1	17.6	35.6	12.5	18.8	34.0
	NQA25	17.3	20.6	46.9	17.0	21.3	46.1	16.5	22.5	44.7	15.9	23.9	43.1
	NQA30	20.4	24.0	55.2	20.2	24.5	54.8	19.5	25.9	52.9	18.8	27.5	51.1
30°F	NQA04	3.1	3.6	8.3	3.1	3.6	8.3	3.0	3.8	8.0	2.9	4.1	7.7
	NQA05	3.8	4.2	10.0	3.7	4.4	9.8	3.6	4.7	9.5	3.5	5.0	9.1
	NQA08	5.6	6.2	14.7	5.6	6.2	14.7	5.4	6.5	14.4	5.3	6.9	13.9
	NQA10	8.3	9.1	21.8	8.0	9.6	21.1	7.7	10.2	20.4	7.4	10.8	19.6
	NQA13	9.5	10.6	24.9	9.1	11.2	24.1	8.8	11.9	23.3	8.5	12.6	22.5
	NQA15	11.2	12.1	29.7	10.9	12.7	28.7	10.5	13.4	27.8	10.2	14.2	26.8
	NQA20	15.3	16.3	40.4	15.1	16.7	39.9	14.5	17.8	38.3	13.9	19.1	36.8
	NQA25	19.1	20.7	50.5	18.7	21.7	49.3	18.1	23.0	47.8	17.5	24.3	46.2
	NQA30	22.6	24.1	59.6	22.2	25.0	58.6	21.5	26.4	56.8	20.8	28.0	54.9
35°F	NQA04	3.5	3.5	9.0	3.5	3.6	8.9	3.4	3.9	8.6	3.2	4.1	8.3
	NQA05	4.2	4.1	10.8	4.1	4.4	10.5	3.9	4.7	10.1	3.8	5.1	9.8
	NQA08	6.1	6.3	15.8	6.2	6.3	15.8	6.0	6.6	15.4	5.8	7.0	14.9
	NQA10	9.1	9.2	23.4	8.8	9.8	22.6	8.5	10.4	21.8	8.2	11.0	21.0
	NQA13	10.3	10.9	26.6	10.0	11.5	25.8	9.7	12.2	24.9	9.3	12.9	24.0
	NQA15	12.3	12.3	31.7	11.9	13.0	30.7	11.5	13.7	29.7	11.2	14.5	28.7
	NQA20	17.0	16.3	43.7	16.6	17.0	42.7	16.0	18.1	41.2	15.4	19.3	39.6
	NQA25	21.1	21.0	54.2	20.5	22.2	52.6	19.8	23.5	51.0	19.2	24.8	49.3
	NQA30	25.0	24.3	64.3	24.4	25.5	62.7	23.6	26.9	60.8	22.8	28.5	58.8
40°F	NQA04	3.9	3.5	9.7	3.8	3.7	9.5	3.7	3.9	9.3	3.6	4.2	8.9
	NQA05	4.6	4.2	11.5	4.4	4.5	11.2	4.3	4.8	10.8	4.2	5.1	10.4
	NQA08	6.8	6.3	17.0	6.7	6.3	16.9	6.5	6.7	16.4	6.4	7.1	15.9
	NQA10	9.9	9.4	24.9	9.6	10.0	24.1	9.3	10.6	23.3	8.9	11.2	22.5
	NQA13	11.2	11.2	28.2	10.9	11.8	27.4	10.6	12.5	26.5	10.2	13.2	25.6
	NQA15	13.4	12.6	33.8	13.0	13.3	32.7	12.6	14.0	31.7	12.2	14.8	30.6
	NQA20	18.8	16.3	47.1	18.2	17.3	45.7	17.6	18.4	44.1	16.9	19.6	42.5
	NQA25	23.0	21.5	57.8	22.3	22.7	56.1	21.6	24.0	54.3	21.0	25.4	52.6
	NQA30	27.4	24.7	68.9	26.6	26.1	66.9	25.8	27.5	64.8	25.0	29.1	62.8

[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, the use of an appropriate ethylene glycol solution where needed, R-410A refrigerant, and operating at sea level.

[2]kW = Compressors and condenser fan motors input power at rated voltage.

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

Leaving Coolant Temp	Model	Condenser Entering 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)
45°F	NQA04	4.3	3.5	10.3	4.2	3.7	10.0	4.0	4.0	9.7	3.9	4.2	9.4
	NQA05	5.0	4.2	12.0	4.9	4.6	11.7	4.7	4.9	11.3	4.5	5.2	10.9
	NQA08	7.5	6.3	17.9	7.4	6.4	17.7	7.2	6.8	17.2	7.0	7.2	16.7
	NQA10	10.8	9.6	26.0	10.5	10.2	25.2	10.1	10.8	24.3	9.8	11.4	23.5
	NQA13	12.2	11.5	29.4	11.9	12.1	28.5	11.5	12.8	27.6	11.1	13.5	26.7
	NQA15	14.6	12.9	35.1	14.2	13.6	34.1	13.8	14.4	33.0	13.3	15.1	31.9
	NQA20	20.5	16.6	49.2	19.9	17.6	47.7	19.2	18.7	46.1	18.6	19.9	44.6
	NQA25	25.1	22.0	60.2	24.4	23.2	58.4	23.6	24.5	56.6	22.9	25.9	54.8
	NQA30	29.9	25.3	71.8	29.1	26.7	69.8	28.2	28.1	67.7	27.3	29.7	65.5
50°F	NQA04	4.7	3.5	11.2	4.5	3.8	10.9	4.4	4.0	10.5	4.3	4.3	10.2
	NQA05	5.4	4.3	13.0	5.3	4.6	12.7	5.1	4.9	12.3	4.9	5.3	11.8
	NQA08	8.2	6.3	19.7	8.1	6.5	19.3	7.8	6.9	18.8	7.6	7.3	18.2
	NQA10	11.7	9.8	28.2	11.4	10.4	27.3	11.0	11.0	26.5	10.6	11.7	25.6
	NQA13	13.3	11.8	31.8	12.9	12.4	30.9	12.5	13.1	29.9	12.0	13.8	28.9
	NQA15	15.8	13.3	38.0	15.4	14.0	36.9	14.9	14.7	35.8	14.4	15.5	34.6
	NQA20	22.3	17.0	53.4	21.6	18.0	51.9	20.9	19.1	50.2	20.2	20.3	48.6
	NQA25	27.2	22.5	65.3	26.4	23.8	63.4	25.6	25.1	61.5	24.8	26.5	59.5
	NQA30	32.5	26.0	77.9	31.6	27.4	75.7	30.6	28.8	73.5	29.6	30.4	71.1
55°F	NQA04	5.0	3.6	11.9	4.9	3.8	11.9	4.8	4.1	11.5	4.6	4.3	11.1
	NQA05	5.9	4.4	14.1	5.7	4.7	13.7	5.5	5.0	13.2	5.3	5.4	12.8
	NQA08	9.0	6.3	21.6	8.8	6.6	21.0	8.5	7.0	20.4	8.3	7.4	19.8
	NQA10	12.7	10.1	30.5	12.3	10.7	29.6	11.9	11.3	28.7	11.5	11.9	27.7
	NQA13	14.3	12.1	34.4	13.9	12.8	33.4	13.5	13.5	32.4	13.0	14.2	31.2
	NQA15	17.1	13.7	41.2	16.6	14.4	39.9	16.0	15.1	38.5	15.5	15.9	37.3
	NQA20	24.2	17.3	58.1	23.4	18.3	56.2	22.7	19.5	54.5	22.0	20.7	52.8
	NQA25	29.6	23.1	71.2	28.6	24.4	68.7	27.7	25.7	66.5	26.9	27.1	64.5
	NQA30	35.1	26.8	84.2	34.1	28.1	81.9	33.1	29.6	79.6	32.1	31.1	77.0
60°F	NQA04	4.8	3.5	11.6	5.0	3.8	12.0	5.1	4.1	12.3	5.0	4.4	12.1
	NQA05	6.2	4.5	14.9	6.2	4.8	14.9	6.0	5.1	14.3	5.8	5.5	13.8
	NQA08	9.8	6.4	23.5	9.5	6.7	22.8	9.2	7.1	22.2	9.0	7.5	21.5
	NQA10	13.7	10.3	32.9	13.3	10.9	31.8	12.8	11.5	30.8	12.4	12.2	29.9
	NQA13	15.5	12.5	37.3	15.0	13.1	36.0	14.5	13.8	34.8	14.0	14.6	33.6
	NQA15	18.1	14.1	43.5	18.0	14.8	43.3	17.3	15.6	41.6	16.7	16.3	40.2
	NQA20	24.3	17.4	58.4	25.0	18.7	60.1	24.6	19.9	59.1	23.8	21.1	57.1
	NQA25	29.6	23.4	71.2	30.5	25.0	73.2	30.0	26.4	72.2	29.0	27.8	69.6
	NQA30	37.9	27.6	90.9	36.7	29.0	88.2	35.6	30.4	85.6	34.6	32.0	83.1
65°F	NQA04	4.6	3.5	11.1	4.8	3.7	11.6	5.0	4.1	12.0	5.1	4.4	12.3
	NQA05	6.0	4.4	14.5	6.3	4.8	15.0	6.4	5.2	15.4	6.2	5.6	15.0
	NQA08	10.6	6.5	25.5	10.3	6.9	24.7	10.0	7.2	24.0	9.7	7.6	23.3
	NQA10	14.8	10.6	35.6	14.3	11.2	34.4	13.8	11.8	33.2	13.3	12.4	32.1
	NQA13	15.6	12.7	37.4	15.9	13.5	38.2	15.7	14.3	37.6	15.0	15.0	36.0
	NQA15	17.6	14.2	42.2	18.2	15.1	43.6	18.6	16.1	44.6	18.1	16.9	43.4
	NQA20	23.6	17.4	56.7	24.5	18.7	58.8	25.1	20.1	60.4	25.6	21.6	61.5
	NQA25	28.8	23.6	69.1	29.8	25.1	71.5	30.5	26.7	73.3	31.0	28.5	74.6
	NQA30	39.9	28.6	95.9	39.6	29.9	95.1	38.3	31.4	92.1	37.1	32.9	89.0

[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, the use of an appropriate ethylene glycol solution where needed, R-410A refrigerant, and operating at sea level.

[2]kW = Compressors and condenser fan motors input power at rated voltage.

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

Leaving Coolant Temp	Model	Condenser Entering Air Temperature											
		85°F			90°F			95°F			100°F		
		Cap1	Input kW2	Cooler Flow (gpm)	Cap1	Input kW2	Cooler Flow (gpm)	Cap1	Input kW2	Cooler Flow (gpm)	Cap1	Input kW2	Cooler Flow (gpm)
70°F	NQA04	4.4	3.4	10.6	4.6	3.7	11.2	4.8	4.0	11.6	5.0	4.3	12.0
	NQA05	5.8	4.4	13.9	6.1	4.8	14.6	6.3	5.2	15.0	6.4	5.6	15.4
	NQA08	11.0	6.6	26.4	11.2	7.0	26.9	10.8	7.3	26.0	10.5	7.8	25.2
	NQA10	15.1	10.8	36.3	15.5	11.5	37.2	14.9	12.1	35.8	14.4	12.8	34.5
	NQA13	15.1	12.7	36.4	15.6	13.6	37.4	15.9	14.5	38.2	16.1	15.4	38.7
	NQA15	16.9	14.4	40.6	17.6	15.4	42.3	18.2	16.2	43.6	18.5	17.2	44.5
	NQA20	22.5	17.2	54.1	23.7	18.6	56.8	24.5	20.0	58.9	25.1	21.5	60.3
	NQA25	27.5	23.7	66.2	28.8	25.2	69.2	29.8	26.9	71.6	30.4	28.6	73.1
	NQA30	38.8	29.1	93.1	40.2	30.8	96.6	41.2	32.4	99.0	39.8	34.0	95.7
75°F	NQA04	4.2	3.4	10.0	4.4	3.6	10.6	4.7	3.9	11.2	4.8	4.3	11.6
	NQA05	5.5	4.3	13.2	5.8	4.7	14.0	6.1	5.1	14.6	6.2	5.6	15.0
	NQA08	10.4	6.5	25.0	11.0	6.9	26.5	11.5	7.4	27.6	11.4	7.9	27.3
	NQA10	14.6	10.8	35.0	15.2	11.6	36.5	15.5	12.4	37.3	15.5	13.1	37.2
	NQA13	14.5	12.8	34.9	15.1	13.6	36.3	15.5	14.5	37.3	15.8	15.5	38.0
	NQA15	16.1	14.8	38.7	16.9	15.6	40.7	17.6	16.5	42.3	18.1	17.5	43.4
	NQA20	21.3	17.1	51.2	22.6	18.4	54.3	23.6	19.9	56.8	24.4	21.4	58.7
	NQA25	26.2	24.0	62.9	27.6	25.4	66.4	28.8	27.0	69.2	29.6	28.7	71.2
	NQA30	37.1	29.8	89.2	38.9	31.4	93.6	40.2	33.1	96.6	41.1	35.0	98.9
80°F	NQA04	4.1	3.3	9.8	4.3	3.6	10.3	4.6	3.9	10.9	4.7	4.2	11.4
	NQA05	5.4	4.3	12.9	5.7	4.7	13.7	5.9	5.1	14.3	6.1	5.5	14.7
	NQA08	10.0	6.4	24.0	10.6	6.9	25.6	11.2	7.4	26.8	11.6	7.9	27.8
	NQA10	14.1	10.8	33.8	14.7	11.6	35.4	15.2	12.4	36.6	15.6	13.3	37.4
	NQA13	14.2	12.8	34.2	14.8	13.6	35.7	15.3	14.6	36.7	15.6	15.5	37.5
	NQA15	15.8	15.0	38.0	16.7	15.8	40.0	17.3	16.7	41.6	17.8	17.7	42.8
	NQA20	20.9	17.0	50.1	22.2	18.4	53.3	23.2	19.8	55.8	24.0	21.4	57.8
	NQA25	25.8	24.0	61.9	27.2	25.5	65.5	28.4	27.1	68.3	29.3	28.8	70.4
	NQA30	36.3	30.2	87.2	38.2	31.8	91.8	39.6	33.5	95.3	40.7	35.4	97.8

[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, the use of an appropriate ethylene glycol solution where needed, R-410A refrigerant, and operating at sea level.

[2]kW = Compressors and condenser fan motors input power at rated voltage.

NQW Series Water-Cooled Condenser Chiller Cooling Capacities - 60 Hz

Leaving Coolant Temp	Model	Condenser Entering 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	NQW05	3.1	4.2	8.6	3.1	4.2	8.6	3.0	4.4	8.3	2.9	4.8	8.0
	NQW08	4.5	6.2	12.6	4.5	6.2	12.6	4.4	6.5	12.3	4.3	6.9	11.9
	NQW10	6.6	9.0	18.5	6.6	9.0	18.5	6.4	9.5	18.0	6.2	10.1	17.2
	NQW15	9.1	11.9	25.4	9.1	11.9	25.4	8.9	12.3	24.9	8.6	13.0	24.1
	NQW20	12.2	16.3	34.1	12.2	16.3	34.1	12.0	16.9	33.3	11.4	18.1	31.8
	NQW25	15.6	20.5	43.4	15.5	20.5	43.4	15.3	21.2	42.6	14.8	22.5	41.2
	NQW30	18.3	23.9	51.0	18.3	23.9	51.0	18.0	24.6	50.1	17.3	26.1	48.4
	NQW35	20.5	27.1	57.3	20.5	27.1	57.3	20.3	27.6	56.7	19.6	29.3	54.6
	NQW40	24.0	32.0	67.0	24.0	32.0	67.0	23.6	32.9	65.9	22.8	34.9	63.7
25°F	NQW05	3.4	4.2	9.3	3.4	4.2	9.3	3.3	4.4	9.0	3.2	4.8	8.7
	NQW08	5.0	6.2	13.6	5.0	6.2	13.6	4.9	6.5	13.3	4.7	6.9	12.8
	NQW10	7.4	9.1	20.1	7.4	9.1	20.1	7.2	9.5	19.5	6.9	10.2	18.7
	NQW15	10.1	12.0	27.5	10.1	12.0	27.5	9.9	12.4	27.0	9.6	13.1	26.0
	NQW20	13.7	16.2	37.1	13.7	16.2	37.1	13.4	16.9	36.3	12.8	18.1	34.7
	NQW25	17.3	20.6	46.8	17.3	20.6	46.8	16.9	21.4	45.9	16.4	22.7	44.4
	NQW30	20.3	24.0	55.1	20.3	24.0	55.1	20.0	24.8	54.2	19.3	26.3	52.3
	NQW35	23.0	27.3	62.2	23.0	27.3	62.2	22.7	27.8	61.5	21.9	29.5	59.3
	NQW40	26.7	32.1	72.3	26.7	32.1	72.3	26.2	33.1	71.0	25.4	35.2	68.8
30°F	NQW05	3.8	4.2	10.0	3.8	4.2	10.0	3.7	4.4	9.7	3.5	4.8	9.4
	NQW08	5.6	6.2	14.7	5.6	6.2	14.7	5.4	6.5	14.3	5.2	7.0	13.8
	NQW10	8.3	9.1	21.8	8.3	9.1	21.8	8.0	9.6	21.1	7.7	10.2	20.3
	NQW15	11.2	12.1	29.6	11.2	12.1	29.6	11.0	12.5	29.1	10.7	13.2	28.1
	NQW20	15.3	16.3	40.3	15.3	16.3	40.3	14.9	16.9	39.3	14.3	18.1	37.8
	NQW25	19.1	20.7	50.4	19.1	20.7	50.4	18.7	21.5	49.4	18.1	22.9	47.8
	NQW30	22.6	24.2	59.5	22.6	24.2	59.5	22.1	25.0	58.4	21.4	26.5	56.5
	NQW35	25.6	27.5	67.5	25.6	27.5	67.5	25.2	28.1	66.6	24.4	29.7	64.3
	NQW40	29.5	32.2	77.9	29.5	32.2	77.9	29.0	33.3	76.5	28.1	35.4	74.1
35°F	NQW05	4.2	4.1	10.8	4.2	4.1	10.8	4.1	4.4	10.5	3.9	4.7	10.1
	NQW08	6.1	6.3	15.8	6.1	6.3	15.8	6.0	6.6	15.4	5.8	7.0	14.9
	NQW10	9.1	9.1	23.5	9.1	9.1	23.5	8.9	9.6	22.8	8.5	10.2	22.0
	NQW15	12.4	12.1	32.0	12.4	12.1	31.9	12.2	12.6	31.3	11.8	13.3	30.3
	NQW20	16.9	16.3	43.6	16.9	16.3	43.6	16.5	17.0	42.5	15.9	18.1	40.9
	NQW25	21.1	20.8	54.3	21.1	20.8	54.3	20.6	21.7	53.1	20.0	23.1	51.4
	NQW30	24.9	24.3	64.2	24.9	24.3	64.1	24.4	25.2	62.9	23.6	26.7	60.8
	NQW35	28.4	27.8	73.1	28.4	27.8	73.1	28.0	28.5	72.0	27.0	30.0	69.6
	NQW40	32.6	32.3	83.8	32.6	32.3	83.8	31.9	33.6	82.2	31.0	35.6	79.7
40°F	NQW05	4.6	4.1	11.6	4.6	4.1	11.6	4.5	4.4	11.2	4.3	4.7	10.9
	NQW08	6.8	6.3	17.0	6.8	6.3	17.0	6.6	6.6	16.5	6.4	7.0	16.0
	NQW10	10.1	9.1	25.3	10.1	9.1	25.3	9.8	9.7	24.5	9.4	10.3	23.7
	NQW15	13.7	12.2	34.4	13.7	12.2	34.4	13.4	12.7	33.6	13.0	13.4	32.6
	NQW20	18.7	16.3	47.0	18.7	16.3	47.0	18.2	17.1	45.8	17.6	18.2	44.2
	NQW25	23.2	21.0	58.4	23.2	21.0	58.4	22.7	22.0	57.0	22.0	23.3	55.2
	NQW30	27.5	24.5	69.0	27.5	24.5	69.0	26.9	25.5	67.5	26.0	26.9	65.4
	NQW35	31.4	28.1	79.0	31.4	28.1	78.9	30.9	28.8	77.6	29.9	30.4	75.1
	NQW40	35.9	32.4	90.1	35.9	32.4	90.1	35.1	33.8	88.2	34.1	35.8	85.5

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F (5.6°C), 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 use of R-410A refrigerant.

[2]kW = Compressor motor(s) input power at rated voltage.

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

Leaving Coolant Temp	Model	Condenser Entering 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)
45°F	NQW05	5.1	4.1	12.2	5.1	4.1	12.2	4.9	4.4	11.8	4.8	4.7	11.4
	NQW08	7.5	6.3	17.9	7.5	6.3	17.9	7.2	6.7	17.4	7.0	7.1	16.8
	NQW10	11.1	9.1	26.7	11.1	9.2	26.6	10.7	9.7	25.8	10.4	10.3	24.9
	NQW15	15.1	12.3	36.1	15.1	12.3	36.1	14.7	12.9	35.3	14.3	13.6	34.2
	NQW20	20.6	16.4	49.5	20.6	16.4	49.5	20.1	17.2	48.2	19.4	18.3	46.6
	NQW25	25.6	21.1	61.4	25.6	21.1	61.4	24.9	22.2	59.8	24.2	23.5	58.0
	NQW30	30.2	24.7	72.5	30.2	24.7	72.5	29.5	25.8	70.8	28.6	27.2	68.7
	NQW35	34.8	28.4	83.4	34.8	28.4	83.4	34.1	29.3	81.8	33.0	30.9	79.2
	NQW40	39.5	32.6	94.7	39.5	32.6	94.7	38.6	34.1	92.5	37.4	36.1	89.8
50°F	NQW05	5.6	4.1	13.4	5.5	4.1	13.3	5.4	4.4	12.9	5.2	4.7	12.5
	NQW08	8.2	6.3	19.7	8.2	6.3	19.6	7.9	6.7	19.0	7.7	7.1	18.5
	NQW10	12.2	9.2	29.3	12.1	9.3	29.1	11.8	9.8	28.2	11.4	10.4	27.3
	NQW15	16.5	12.5	39.5	16.5	12.5	39.5	16.1	13.1	38.5	15.6	13.8	37.4
	NQW20	22.6	16.4	54.2	22.6	16.4	54.2	22.0	17.3	52.7	21.3	18.4	51.1
	NQW25	28.0	21.3	67.3	28.0	21.3	67.3	27.3	22.4	65.4	26.4	23.7	63.4
	NQW30	33.1	25.0	79.4	33.1	25.0	79.4	32.2	26.2	77.4	31.3	27.6	75.1
	NQW35	38.2	28.6	91.7	38.2	28.6	91.7	37.4	29.7	89.7	36.2	31.3	87.0
	NQW40	43.2	32.8	103.7	43.2	32.8	103.7	42.2	34.4	101.2	40.9	36.3	98.2
55°F	NQW05	6.1	4.1	14.6	6.1	4.1	14.5	5.9	4.4	14.1	5.7	4.7	13.6
	NQW08	9.0	6.3	21.6	8.9	6.4	21.5	8.7	6.8	20.8	8.4	7.1	20.2
	NQW10	13.3	9.2	32.0	13.2	9.4	31.7	12.8	9.9	30.8	12.4	10.5	29.8
	NQW15	17.7	12.6	42.4	17.7	12.6	42.4	17.5	13.3	42.0	17.0	14.0	40.7
	NQW20	24.3	16.5	58.3	24.3	16.5	58.3	24.0	17.4	57.5	23.2	18.5	55.8
	NQW25	29.2	21.5	70.0	29.2	21.5	70.0	29.8	22.7	71.6	28.8	24.0	69.2
	NQW30	36.1	25.4	86.6	36.1	25.4	86.6	35.1	26.6	84.3	34.1	28.0	81.8
	NQW35	40.1	28.9	96.2	40.1	28.9	96.2	41.0	30.1	98.4	39.7	31.7	95.2
	NQW40	47.2	33.1	113.4	47.2	33.1	113.4	46.0	34.8	110.4	44.7	36.7	107.2
60°F	NQW05	6.0	4.1	14.3	6.0	4.1	14.4	6.2	4.4	14.9	6.2	4.8	14.9
	NQW08	9.8	6.3	23.6	9.8	6.4	23.4	9.5	6.8	22.8	9.2	7.2	22.1
	NQW10	14.5	9.3	34.9	14.4	9.5	34.6	13.9	10.0	33.5	13.5	10.6	32.5
	NQW15	17.1	12.9	41.2	17.1	12.9	41.2	17.7	13.5	42.6	18.2	14.2	43.8
	NQW20	23.6	16.5	56.6	23.6	16.5	56.6	24.4	17.5	58.5	25.1	18.6	60.2
	NQW25	28.3	21.8	67.9	28.3	21.8	67.9	29.3	22.9	70.3	30.1	24.2	72.4
	NQW30	39.1	25.8	93.9	39.2	25.9	94.0	38.1	27.2	91.5	37.0	28.5	88.9
	NQW35	38.9	29.1	93.3	38.9	29.1	93.3	39.9	30.3	95.8	41.1	32.1	98.8
	NQW40	51.5	33.4	123.7	51.4	33.5	123.5	50.0	35.2	120.2	48.6	37.1	116.8
65°F	NQW05	5.8	4.1	13.8	5.8	4.1	13.9	6.0	4.4	14.5	6.2	4.8	14.9
	NQW08	10.8	6.3	25.9	10.6	6.5	25.6	10.3	6.8	24.8	10.0	7.2	24.1
	NQW10	14.4	9.4	34.5	14.6	9.6	35.1	15.1	10.1	36.3	14.7	10.7	35.3
	NQW15	16.5	13.2	39.7	16.5	13.2	39.7	17.2	13.8	41.3	17.8	14.5	42.6
	NQW20	22.7	16.6	54.6	22.7	16.6	54.6	23.6	17.5	56.7	24.4	18.7	58.6
	NQW25	27.3	22.1	65.5	27.3	22.1	65.5	28.4	23.2	68.1	29.3	24.5	70.4
	NQW30	37.7	26.5	90.6	37.8	26.5	90.8	39.3	27.8	94.4	40.2	29.1	96.6
	NQW35	37.4	29.3	90.0	37.4	29.3	90.0	38.6	30.5	92.7	40.0	32.3	96.0
	NQW40	56.1	33.9	134.7	55.9	34.1	134.2	54.3	35.7	130.4	52.8	37.6	126.8

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F (5.6°C), 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 use of R-410A refrigerant.

[2]kW = Compressor motor(s) input power at rated voltage.

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

Leaving Coolant Temp	Model	Condenser Entering 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)
70°F	NQW05	5.5	4.1	13.2	5.5	4.1	13.3	5.8	4.4	14.0	6.0	4.7	14.5
	NQW08	10.6	6.3	25.6	10.9	6.5	26.1	11.3	6.9	27.1	10.9	7.2	26.2
	NQW10	13.8	9.5	33.1	14.0	9.6	33.6	14.6	10.2	35.1	15.1	10.8	36.4
	NQW15	15.8	13.6	38.0	15.8	13.6	38.0	16.5	14.2	39.7	17.2	14.8	41.3
	NQW20	21.8	16.6	52.3	21.8	16.6	52.3	22.7	17.5	54.5	23.6	18.7	56.8
	NQW25	26.1	22.5	62.7	26.1	22.5	62.7	27.3	23.5	65.6	28.4	24.8	68.2
	NQW30	36.1	27.3	86.8	36.2	27.3	86.9	37.9	28.5	91.0	39.4	29.8	94.5
	NQW35	35.8	29.3	86.1	35.8	29.3	86.1	37.0	30.5	89.0	38.6	32.5	92.8
	NQW40	54.9	34.5	132.0	55.3	34.7	132.9	57.8	36.3	139.0	57.3	38.1	137.6
75°F	NQW05	5.3	4.1	12.7	5.3	4.1	12.6	5.6	4.4	13.4	5.8	4.8	14.0
	NQW08	10.1	6.3	24.3	10.3	6.4	24.8	10.9	6.8	26.1	11.3	7.3	27.2
	NQW10	13.1	9.6	31.5	13.3	9.7	32.0	14.0	10.3	33.7	14.6	10.9	35.1
	NQW15	15.2	14.0	36.4	15.0	14.1	36.1	15.8	14.6	38.0	16.6	15.2	39.8
	NQW20	20.9	16.6	50.2	20.6	16.6	49.6	21.7	17.5	52.1	22.7	18.7	54.6
	NQW25	25.1	22.8	60.4	24.7	23.0	59.4	26.1	24.0	62.6	27.3	25.1	65.6
	NQW30	34.6	28.1	83.0	34.3	28.3	82.3	36.2	29.4	87.0	37.9	30.6	91.1
	NQW35	34.6	29.2	83.0	34.0	29.2	81.6	35.3	30.4	84.8	37.1	32.5	89.1
	NQW40	52.2	35.3	125.4	52.5	35.4	126.1	55.4	37.0	133.2	57.9	38.7	139.1
80°F	NQW05	5.3	4.1	12.7	5.1	4.1	12.3	5.4	4.4	13.1	5.7	4.8	13.7
	NQW08	10.1	6.3	24.2	10.0	6.4	24.0	10.5	6.8	25.3	11.0	7.2	26.4
	NQW10	13.0	9.6	31.3	12.9	9.8	30.9	13.6	10.4	32.7	14.2	10.9	34.1
	NQW15	15.2	14.0	36.4	14.7	14.3	35.4	15.5	14.8	37.3	16.3	15.4	39.1
	NQW20	20.9	16.6	50.2	20.3	16.6	48.8	21.3	17.5	51.2	22.4	18.7	53.7
	NQW25	25.1	22.8	60.4	24.4	23.1	58.7	25.7	24.1	61.8	27.0	25.3	64.8
	NQW30	34.6	28.1	83.0	33.6	28.7	80.7	35.6	29.8	85.5	37.2	31.0	89.5
	NQW35	34.6	29.2	83.0	33.6	29.1	80.7	34.9	30.4	83.8	36.7	32.5	88.1
	NQW40	51.9	35.4	124.7	52.2	35.5	125.5	55.0	37.1	132.2	57.4	38.9	137.9

[1]Cap = Capacity in tons of refrigeration based on a coolant temperature rise of 10°F (5.6°C), 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 use of R-410A refrigerant.

[2]kW = Compressor motor(s) input power at rated voltage.

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

Leaving Coolant Temp	Model	Condenser Entering 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	NQR05	3.1	4.2	8.6	3.1	4.2	8.6	3.0	4.3	8.4	3.0	4.7	8.5
	NQR08	4.5	6.2	12.6	4.5	6.2	12.6	4.4	6.6	12.2	4.4	7.0	12.2
	NQR10	6.6	9.0	18.5	6.6	9.3	18.3	6.3	9.8	17.5	6.3	10.5	17.6
	NQR15	9.1	11.9	25.4	9.1	11.9	25.4	8.8	12.5	24.7	8.9	13.3	24.9
	NQR20	12.2	16.3	34.1	12.3	16.3	34.2	11.7	17.4	32.6	11.6	18.8	32.3
	NQR25	15.6	20.5	43.4	15.6	20.6	43.4	15.0	21.8	41.9	15.0	23.2	41.8
	NQR30	18.3	23.9	51.0	18.3	23.9	51.1	17.7	25.3	49.4	17.6	26.9	49.0
	NQR35	20.5	27.1	57.3	20.6	27.2	57.4	19.8	28.8	55.3	19.6	30.6	54.7
	NQR40	24.0	32.0	67.0	23.9	32.2	66.8	23.2	34.1	64.6	22.4	36.1	62.6
25°F	NQR05	3.4	4.2	9.3	3.4	4.2	9.3	3.3	4.4	9.1	3.2	4.7	8.7
	NQR08	5.0	6.2	13.6	5.0	6.3	13.5	4.8	6.7	13.1	4.7	7.1	12.7
	NQR10	7.4	9.1	20.1	7.3	9.4	19.7	7.0	10.0	19.0	6.7	10.6	18.2
	NQR15	10.1	12.0	27.4	10.1	12.0	27.4	9.8	12.7	26.5	9.5	13.5	25.6
	NQR20	13.7	16.2	37.2	13.6	16.5	36.9	13.0	17.6	35.3	12.5	18.9	33.8
	NQR25	17.3	20.6	46.8	17.1	21.0	46.5	16.6	22.2	45.0	16.0	23.5	43.4
	NQR30	20.3	24.0	55.1	20.2	24.3	54.8	19.6	25.7	53.0	18.9	27.2	51.3
	NQR35	23.0	27.3	62.3	22.8	27.7	61.8	22.0	29.2	59.6	21.2	31.0	57.6
	NQR40	26.7	32.1	72.3	26.4	32.8	71.5	25.5	34.7	69.3	24.7	36.7	67.1
30°F	NQR05	3.8	4.2	10.0	3.8	4.2	10.0	3.7	4.4	9.7	3.6	4.7	9.4
	NQR08	5.6	6.2	14.7	5.5	6.4	14.5	5.3	6.8	14.0	5.1	7.2	13.6
	NQR10	8.3	9.1	21.8	8.0	9.6	21.1	7.7	10.1	20.3	7.4	10.8	19.6
	NQR15	11.2	12.1	29.6	11.1	12.2	29.4	10.8	12.9	28.4	10.4	13.7	27.5
	NQR20	15.3	16.3	40.3	15.0	16.8	39.6	14.4	17.9	38.1	13.9	19.1	36.6
	NQR25	19.1	20.7	50.5	18.8	21.4	49.6	18.2	22.7	48.1	17.6	24.0	46.5
	NQR30	22.6	24.2	59.5	22.3	24.8	58.8	21.5	26.2	56.8	20.8	27.7	55.0
	NQR35	25.6	27.5	67.5	25.2	28.3	66.4	24.3	29.8	64.2	23.5	31.5	62.0
	NQR40	29.5	32.2	77.9	29.0	33.3	76.5	28.1	35.3	74.1	27.2	37.4	71.8
35°F	NQR05	4.2	4.1	10.8	4.2	4.2	10.8	4.0	4.4	10.4	3.9	4.8	10.1
	NQR08	6.1	6.3	15.8	6.0	6.5	15.5	5.8	6.9	15.0	5.6	7.3	14.5
	NQR10	9.1	9.2	23.4	8.8	9.7	22.6	8.5	10.3	21.8	8.2	11.0	21.0
	NQR15	12.4	12.1	32.0	12.2	12.5	31.4	11.8	13.2	30.5	11.4	13.9	29.4
	NQR20	17.0	16.3	43.6	16.5	17.0	42.5	15.9	18.1	40.9	15.3	19.4	39.3
	NQR25	21.1	20.8	54.3	20.6	21.8	53.0	20.0	23.1	51.3	19.3	24.4	49.7
	NQR30	24.9	24.3	64.2	24.4	25.3	62.8	23.6	26.7	60.8	22.9	28.2	58.8
	NQR35	28.4	27.8	73.1	27.7	28.9	71.3	26.8	30.5	68.9	25.9	32.2	66.6
	NQR40	32.6	32.3	83.9	31.8	33.9	81.7	30.8	35.9	79.2	29.8	38.0	76.7
40°F	NQR05	4.6	4.1	11.6	4.6	4.2	11.5	4.4	4.5	11.1	4.3	4.8	10.8
	NQR08	6.8	6.3	17.0	6.6	6.6	16.5	6.4	7.0	16.0	6.2	7.4	15.5
	NQR10	9.9	9.4	24.9	9.6	9.9	24.1	9.3	10.5	23.3	9.0	11.2	22.5
	NQR15	13.7	12.2	34.4	13.4	12.7	33.5	13.0	13.4	32.5	12.5	14.2	31.5
	NQR20	18.7	16.4	47.0	18.1	17.4	45.4	17.4	18.4	43.8	16.8	19.7	42.2
	NQR25	23.2	21.1	58.3	22.5	22.3	56.5	21.8	23.6	54.7	21.1	24.9	53.0
	NQR30	27.5	24.5	69.1	26.7	25.8	67.0	25.9	27.2	65.0	25.0	28.7	62.8
	NQR35	31.4	28.2	78.9	30.4	29.6	76.3	29.4	31.2	73.8	28.4	32.9	71.4
	NQR40	35.7	32.7	89.8	34.7	34.6	87.1	33.7	36.6	84.5	32.6	38.7	81.9

[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, R-410A refrigerant, and operating at sea level.

[2]kW = Compressors and condenser fan motors input power at rated voltage.

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

Leaving Coolant Temp	Model	Condenser Entering 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)
45°F	NQR05	5.1	4.1	12.2	5.0	4.2	12.0	4.9	4.5	11.6	4.7	4.9	11.3
	NQR08	7.4	6.4	17.8	7.2	6.7	17.2	7.0	7.1	16.7	6.8	7.6	16.2
	NQR10	10.8	9.6	26.0	10.5	10.1	25.2	10.2	10.7	24.4	9.8	11.4	23.5
	NQR15	15.0	12.4	36.1	14.6	13.0	35.0	14.2	13.7	34.0	13.7	14.5	32.9
	NQR20	20.4	16.7	49.0	19.8	17.7	47.4	19.1	18.8	45.8	18.4	20.0	44.2
	NQR25	25.3	21.6	60.7	24.5	22.8	58.9	23.8	24.1	57.1	23.0	25.5	55.2
	NQR30	30.0	25.1	72.0	29.1	26.4	69.9	28.3	27.8	67.8	27.3	29.3	65.6
	NQR35	34.4	29.0	82.4	33.3	30.4	79.8	32.2	32.0	77.3	31.2	33.8	74.8
	NQR40	39.0	33.4	93.5	37.9	35.3	90.8	36.8	37.3	88.2	35.6	39.4	85.4
50°F	NQR05	5.6	4.1	13.4	5.4	4.3	13.1	5.3	4.6	12.7	5.1	4.9	12.3
	NQR08	8.1	6.5	19.3	7.8	6.9	18.8	7.6	7.3	18.2	7.4	7.7	17.7
	NQR10	11.8	9.8	28.2	11.4	10.4	27.3	11.0	11.0	26.5	10.6	11.6	25.6
	NQR15	16.3	12.7	39.1	15.8	13.4	38.0	15.4	14.1	36.9	14.9	14.8	35.7
	NQR20	22.2	17.0	53.2	21.5	18.0	51.6	20.8	19.2	49.9	20.1	20.4	48.2
	NQR25	27.5	22.2	65.9	26.6	23.3	63.9	25.8	24.6	62.0	25.0	26.0	60.0
	NQR30	32.5	25.8	78.1	31.6	27.1	75.8	30.7	28.5	73.6	29.7	30.0	71.2
	NQR35	37.3	29.7	89.6	36.2	31.2	86.8	35.1	32.9	84.2	34.0	34.7	81.5
	NQR40	42.3	34.2	101.5	41.1	36.0	98.6	39.9	38.0	95.8	38.7	40.2	92.8
55°F	NQR05	6.1	4.1	14.6	5.9	4.4	14.2	5.7	4.6	13.7	5.5	5.0	13.3
	NQR08	8.7	6.6	21.0	8.5	7.0	20.4	8.2	7.4	19.8	8.0	7.8	19.2
	NQR10	12.7	10.0	30.5	12.3	10.6	29.6	11.9	11.2	28.7	11.5	11.8	27.7
	NQR15	17.7	13.1	42.5	17.1	13.7	41.2	16.6	14.4	39.8	16.1	15.2	38.6
	NQR20	24.1	17.4	57.8	23.3	18.4	55.9	22.5	19.5	54.1	21.8	20.8	52.3
	NQR25	29.9	22.7	71.8	28.9	23.9	69.5	27.9	25.2	67.1	27.1	26.6	65.0
	NQR30	35.2	26.5	84.4	34.2	27.8	82.0	33.2	29.3	79.6	32.1	30.8	77.1
	NQR35	40.8	30.6	98.0	39.4	32.1	94.5	38.0	33.8	91.3	36.8	35.6	88.4
	NQR40	45.8	35.0	109.9	44.5	36.9	106.8	43.2	38.9	103.8	41.9	41.1	100.6
60°F	NQR05	6.0	4.1	14.3	6.2	4.4	14.8	6.2	4.7	15.0	6.0	5.0	14.4
	NQR08	9.5	6.8	22.7	9.2	7.1	22.1	8.9	7.5	21.5	8.7	8.0	20.8
	NQR10	13.7	10.3	32.9	13.3	10.9	31.9	12.8	11.4	30.8	12.4	12.1	29.9
	NQR15	17.5	13.3	42.1	18.1	14.1	43.5	18.0	14.8	43.2	17.4	15.6	41.7
	NQR20	24.4	17.5	58.5	25.1	18.8	60.3	24.5	20.0	58.7	23.6	21.2	56.6
	NQR25	29.3	22.9	70.3	30.2	24.4	72.4	30.4	25.9	72.9	29.3	27.2	70.3
	NQR30	38.0	27.4	91.3	36.8	28.7	88.5	35.6	30.1	85.6	34.6	31.6	83.1
	NQR35	40.2	30.8	96.6	41.5	32.8	99.6	41.5	34.8	99.6	39.9	36.6	95.9
	NQR40	49.4	35.9	118.7	48.1	37.8	115.4	46.7	39.8	112.2	45.3	42.0	108.7
65°F	NQR05	5.8	4.1	13.8	6.0	4.4	14.4	6.2	4.7	14.9	6.4	5.1	15.3
	NQR08	10.2	6.9	24.6	9.9	7.3	23.9	9.6	7.7	23.1	9.3	8.1	22.4
	NQR10	14.8	10.6	35.7	14.3	11.1	34.4	13.8	11.7	33.2	13.4	12.4	32.1
	NQR15	16.9	13.5	40.6	17.6	14.3	42.3	18.2	15.1	43.6	18.6	16.0	44.6
	NQR20	23.6	17.4	56.7	24.5	18.8	58.9	25.2	20.2	60.5	25.6	21.7	61.4
	NQR25	28.2	23.0	67.8	29.4	24.5	70.6	30.2	26.1	72.7	30.9	27.8	74.2
	NQR30	39.6	28.2	95.1	39.9	29.7	95.9	38.4	31.0	92.3	37.2	32.5	89.3
	NQR35	38.8	30.8	93.2	40.3	32.9	96.9	41.6	35.2	99.9	42.5	37.5	102.0
	NQR40	53.2	36.9	127.8	51.7	38.8	124.1	50.1	40.8	120.4	48.7	43.0	117.0

[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, the use of an appropriate ethylene glycol solution where needed, R-410A refrigerant, and operating at sea level.

[2]kW = Compressors and condenser fan motors input power at rated voltage.

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

Leaving Coolant Temp	Model	Condenser Entering 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)
70°F	NQR05	5.5	4.1	13.2	5.7	4.3	13.8	6.0	4.7	14.4	6.2	5.1	14.9
	NQR08	11.1	7.1	26.7	10.7	7.4	25.8	10.4	7.8	25.0	10.1	8.3	24.2
	NQR10	15.1	10.7	36.2	15.5	11.5	37.2	14.9	12.1	35.9	14.4	12.7	34.6
	NQR15	16.2	13.8	38.8	17.0	14.6	40.8	17.6	15.3	42.4	18.2	16.2	43.6
	NQR20	22.5	17.3	54.1	23.6	18.6	56.7	24.5	20.1	58.9	25.2	21.7	60.5
	NQR25	27.0	23.2	64.8	28.3	24.7	68.0	29.4	26.2	70.6	30.2	27.9	72.6
	NQR30	38.1	28.7	91.6	39.8	30.3	95.5	41.0	32.0	98.5	40.1	33.6	96.3
	NQR35	37.1	30.6	89.1	38.9	32.9	93.4	40.4	35.2	97.1	41.5	37.7	99.7
	NQR40	57.6	38.1	138.5	55.7	39.9	133.9	53.9	41.9	129.4	52.2	44.1	125.4
75°F	NQR05	5.2	4.1	12.6	5.4	4.3	13.1	5.7	4.7	13.8	6.0	5.0	14.4
	NQR08	11.1	7.0	26.7	11.6	7.6	27.8	11.2	8.0	27.0	10.9	8.4	26.1
	NQR10	14.4	10.7	34.7	15.1	11.5	36.2	15.5	12.3	37.3	15.5	13.1	37.3
	NQR15	15.3	14.2	36.7	16.2	14.9	38.9	17.0	15.7	40.9	17.6	16.5	42.3
	NQR20	21.3	17.1	51.2	22.6	18.5	54.2	23.6	20.0	56.8	24.4	21.6	58.7
	NQR25	25.5	23.5	61.3	27.1	24.9	65.0	28.3	26.4	68.1	29.3	28.0	70.4
	NQR30	36.2	29.4	87.0	38.2	30.9	91.8	39.8	32.6	95.7	40.9	34.5	98.3
	NQR35	35.0	30.1	84.2	37.2	32.6	89.3	39.0	35.1	93.6	40.3	37.7	96.8
	NQR40	57.7	38.7	138.6	59.9	41.2	143.9	58.1	43.2	139.7	56.1	45.3	134.8
80°F	NQR05	5.1	4.1	12.3	5.3	4.3	12.8	5.6	4.6	13.5	5.9	5.0	14.1
	NQR08	10.7	7.0	25.7	11.3	7.5	27.1	11.7	8.1	28.0	11.5	8.5	27.6
	NQR10	13.9	10.7	33.5	14.6	11.5	35.2	15.1	12.3	36.4	15.5	13.1	37.3
	NQR15	14.9	14.4	35.9	15.9	15.1	38.2	16.7	15.8	40.1	17.3	16.7	41.6
	NQR20	20.9	17.1	50.2	22.2	18.5	53.2	23.2	19.9	55.8	24.1	21.5	57.8
	NQR25	25.1	23.6	60.4	26.7	24.9	64.1	27.9	26.4	67.2	28.9	28.1	69.6
	NQR30	35.4	29.7	85.2	37.5	31.3	90.1	39.1	33.0	94.0	40.3	34.8	96.9
	NQR35	34.5	30.0	83.0	36.7	32.5	88.1	38.5	35.1	92.5	39.8	37.7	95.8
	NQR40	57.2	38.8	137.6	59.6	41.3	143.3	59.0	43.5	141.9	56.8	45.6	136.5

[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, R-410A refrigerant, and operating at sea level.

[2]kW = Compressors and condenser fan motors 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 must not exceed 10°F warmer than the maximum set point temperature of the chiller.

Process Fluid Flow Rate

The nominal performance of the chiller assumes a temperature rise of 10°F through the process. 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 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 design allows the unit to start and operate with 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 $2^{[(6.3\text{-}pH)/0.3]}$ 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 is sometimes done to allow for future growth. While this practice may be necessary, it is highly recommended that chillers not be oversized by more than 15% at 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 periods of time operating at reduced loads it is recommended that two smaller chillers be considered as operating smaller chillers at higher loads is preferred to operating one larger chiller at or near its minimum load capacity.

Strainers

Each evaporator is provided with a 20 mesh inlet strainer to protect the evaporator. All water-cooled condensers should be filtered 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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