Supplemental Instructions

Models:

Q24H4D Q30H4D Q36H4D Q43H4D Q48H4D

Q**H4D dehumidification models provide a unique dehumidification circuit for periods of low outdoor ambient temperature and high indoor humidity conditions.

Refer to Spec Sheet S3607 for the standard features of the base units and this manual for electrical data.

Dehumidification Circuit

The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream. This coil uses discharge gas to reheat the supply air after it passes over the cooling coil without requiring the electric resistance heater to be used for reheat purposes. This results in very high mechanical dehumidification capability from the air conditioner on demand without using electric resistance reheat.

The dehumidification refrigerant reheat circuit is controlled by a dehumidification valve directing the refrigerant gas to the normal condenser during periods when standard air conditioning is required. During periods of time of low ambient temperature (approximately 65° to 75° outdoor) and high indoor humidity, a humidistat senses the need for mechanical dehumidification. It then energizes both the compressor circuit and dehumidification valve, thus directing the hot refrigerant discharge gas into a separate desuperheating condenser circuit, which reheats the conditioned air before it is delivered to the room. The refrigerant gas is then routed from the desuperheating condenser to the system condenser for further heat transfer. When the humidistat is satisfied, the system automatically switches back to normal operation and either continues to operate or turns off based on the signal from the wall thermostat. The result is separate humidity control at minimum operating cost.

Dehumidification Sequence of Operation

Dehumidification is controlled through the thermostat (if capable) or through a separate humidistat. On a call for dehumidification mode of operation, the compressor and dehumidification valve of the unit are energized through circuit R - D to provide dehumidification. Dehumidification will continue until the humidistat is satisfied.

A cooling call takes precedence over a dehumidification call for as long as the cooling call is present.

A heating call takes precedence over a dehumidification call unless an occupied signal is received. When occupied, a dehumidification call takes precedence over first stage heating. A second stage heating call takes precedence over a dehumidification call even when occupied.

Refer to the chart on page 11 for a full list of outputs that can be expected for different input combinations.

Balanced Climate™ Mode

Enable Balanced Climate mode for cooling operation ONLY and utilize a 2-stage thermostat to enhance the comfort. To activate this mode, the jumpers between Y1 and Y2 on both low voltage terminal strips (blower section and control panel) need to be removed. Refer to unit wiring diagram for clarity.

This mode will allow the indoor blower to run at a reduced airflow on the first stage of cooling. A 2-stage thermostat connected to Y2 will then allow the airflow to return to normal rated speed if the call for cooling is not satisfied within the allotted time frame specified by the thermostat.

Bard® SINCE 1914
Climate Control Solutions

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manual: 7960-922A
Supersedes: 7960-922
Date: 9-28-22

Electronic Expansion Valve

Operation

This model employs an electronic expansion valve (EEV) which meters the refrigerant to the evaporator. In the heat pump application, the EEV is used bi-directionally to meter the refrigerant in both heating and cooling modes. The EEV is made of a stepper motor that is controlled with a step output from the controller. The valve is capable of 480 steps which drives a needle valve that in turn regulates the flow of refrigerant. The EEV allows for tighter control and better capacity management in varying operating conditions than a standard TXV. The EEV system consists of the electronic valve and stator, control board, relay, suction temperature sensor and suction pressure transducer. The pressure transducer and temperature sensor monitor the suction line to provide real time data to the control board so that a real time superheat can be calculated. This then determines the EEV position. The controller is set to maintain around 18° superheat. The relay is used to activate the EEV system's controller anytime that the compressor is energized.

EEV Instructions for Vacuuming, Reclaiming and Charging Unit

⚠ WARNING

Exposure to high pressure refrigerant hazard.

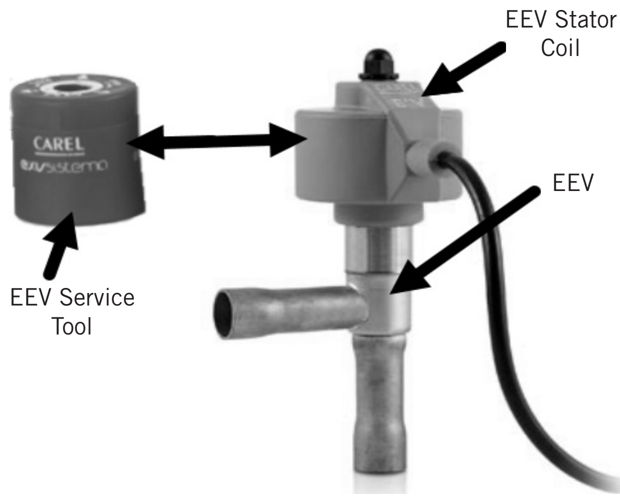
This unit is equipped with an electronic expansion valve (EEV). In order to fully recover refrigerant or evacuate system during repairs, either use service tool P/N 2151-021 to manually open the EEV or be sure to recover and evacuate from all service ports: suction, liquid and discharge.

Failure to do so could result in eye injuries and/or refrigerant burns.

DO NOT connect to the high pressure service port on the front of the unit with the RED circular label. This connection point is under very high pressure and could cause injury and/or refrigerant burns.

The electronic expansion valve moves to a closed position when there is no call to control. In order to pull a complete vacuum, fully reclaim the system or charge the unit, connections to the suction and liquid line service ports need to be utilized or the valve needs to be manually opened first. The valve can be opened manually using the magnetic EEV service tool (Bard P/N 2151-021) shown in Figure 1. To do this, remove the EEV stator coil (red color with retaining nut on top), slide the magnetic tool over the shaft where the stator was removed and turn in a clockwise direction to open the valve to the full open position (directional arrows are provided on the tool).

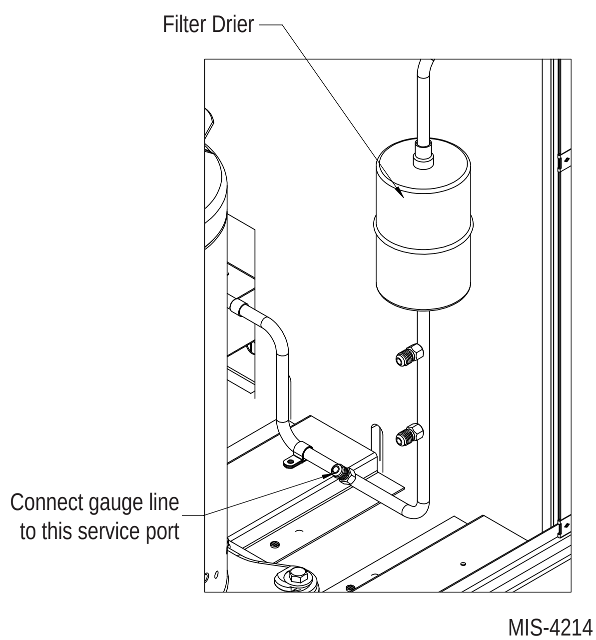
FIGURE 1
Electronic Expansion Valve (EEV) and Service Tool



Reapply the EEV stator coil and retaining nut once complete. Upon powering the unit back up, the control board will automatically drive the EEV back to the fully shut position. Once the compressor starts, the control board will again modulate the EEV position to control the system superheat.

The high side connection should be made at the service port located on the liquid line assembly near the unit base on the right side of the unit (see Figure 2).

FIGURE 2
High Side Connection



Troubleshooting the Electronic Expansion Valve

The control board has two status LEDs.

- The green LED should be lit anytime that the board has power and the control is functioning.

- The red LED is to show that an alarm is present.

See Table 1 for a guide to know where to start troubleshooting the EEV. Refer to the appropriate unit replacement parts manual for any parts that are needed.

Control Board

Check that the controller is getting 24VAC signal (GO 24VAC Hot and G 24VAC common). Reference unit wiring diagram for proper connections. If 24V is present but the green LED is not lit, replace the controller. If the green LED is now lit but the superheat is still not being maintained, troubleshoot the relay to check that the DI is connected to G; refer to ***Relay in EEV Control Box***.

Electronic Expansion Valve

Check to see if valve can be moved by manually moving the stepper motor using the EEV service tool shown in Figure 1 (Bard Part # 2151-021). If valve still does not control, check the transducer and thermistor sensors as described on page 4. If sensors are good, replace the valve.

Relay in EEV Control Box

Contacts NO to DI and COM to G must be closed for EEV control to start controlling superheat. Check that the relay is getting 24VAC. Reference unit wiring diagram for proper connections. If 24V is present, measure the resistance between COM and NO; it should be 0 ohms when the relay is getting 24V. If the resistance is out of range, replace the relay.

Stator Coil

Disconnect the stator from the valve and the control and measure the resistance of the windings using an electrical tester. The resistance of both windings should be around 40 ohms +/– 10%. The four wire sets that will have resistance between them are: White and red, green and red, yellow and purple, blue and purple. If the resistance falls outside these values, replace the stator.

Transducer Sensor

1. Check continuity of all three wires from transducer plug to controller plug. Replace wires if poor connection in any wire.
2. Check to ensure wires are correctly connected as follows:

   Blue wire = pin 1 of controller plug to pin C on transducer plug

   Red wire = pin 2 of controller plug to pin B on transducer plug

   Black wire = pin 3 of controller plug to pin A on transducer plug
3. Check that there is 5VDC Nominal between the red and black wires going to the transducer.
4. Check the signal voltage between the blue and black wires (0.5-4.5VDC Actual). The following formula and Figure 3 can be used to determine if the transducer's voltage to pressure ratio is within range. Replace transducer if out of range.

Formula for Tech:

(Measured Pressure x .016) + .5 =
Expected Transducer Signal Voltage (see Figure 3).

FIGURE 3
Voltage to Pressure: Suction Pressure Transducer

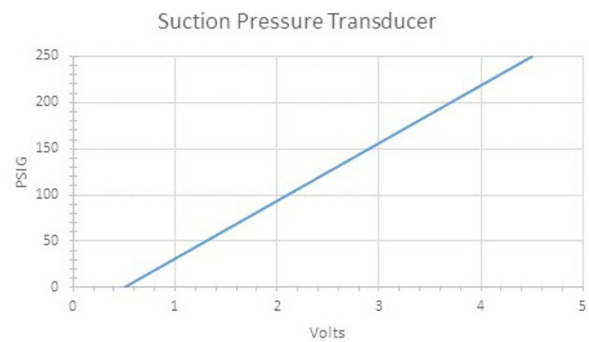


TABLE 1
Electronic Expansion Valve Troubleshooting

Problem	Probable Cause	Troubleshoot
The green LED is not lit.	Controller not receiving 24VAC signal.	Control Board
The green LED is lit, but superheat is not being maintained.	The relay is not closing the controller's DI connection to ground.	Relay
The red LED is flashing and EEV is not controlling superheat properly (18º superheat). One of the following is likely the fault:		
1. Low superheat is detected and the controller is taking steps to protect the system by closing the valve.	Stator is broken or connected incorrectly.	Stator
	Valve is stuck open.	EEV Valve
2. Suction temperature sensor error.	Poor connection of sensor or faulty sensor.	Thermistor
3. Suction pressure transducer error.	Pressure transducer wiring incorrect or faulty transducer.	Transducer
The red LED is on steady.	The operating parameters have been damaged.	Replace Control Board

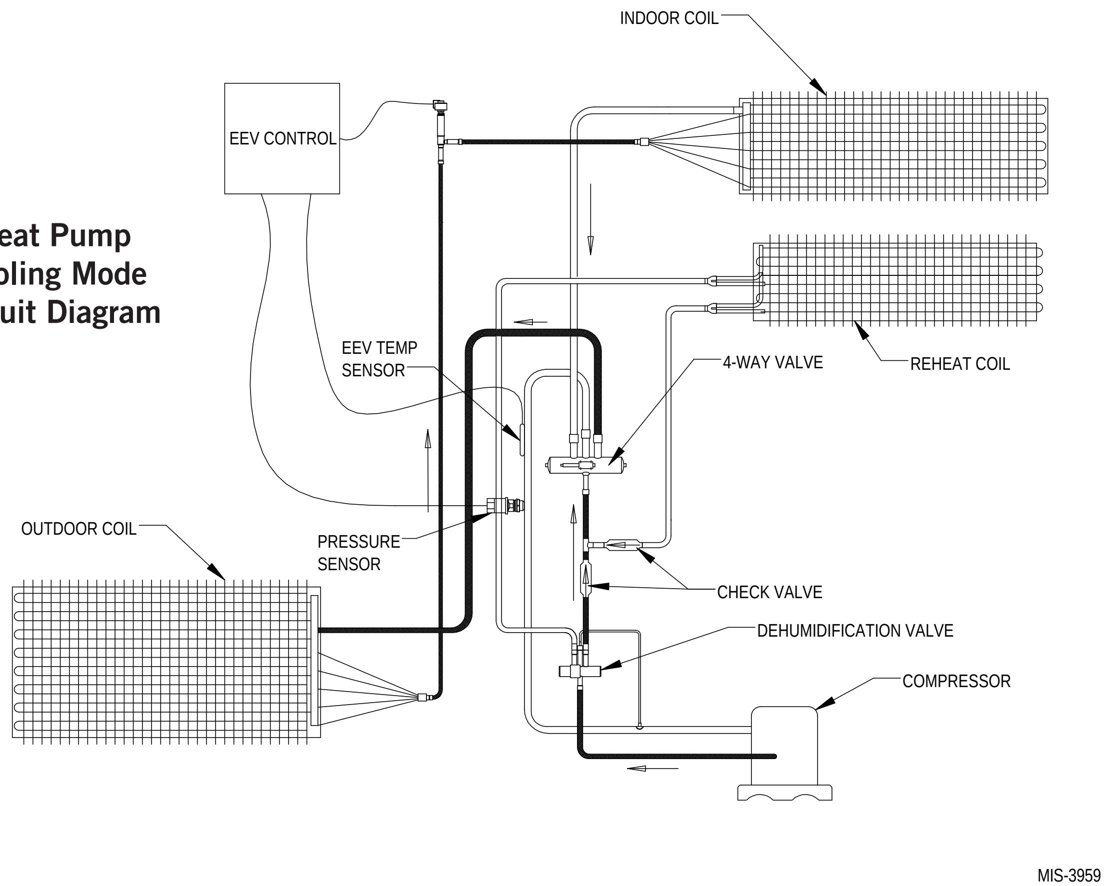
Thermistor Sensor

1. Make a visual check for broken wire insulation, broken wires or cracked epoxy material.
2. Disconnect 10k ohm NTC thermistor from the EEV control box.
3. Use an ohmmeter to measure the resistance between the two connectors. Also use ohmmeter to check for short or open.
4. Compare the resistance reading to Table 2. Use sensor ambient temperature. (Tolerance of part is ±10 %.)
5. If sensor is out of tolerance, shorted, open or reads very low ohms, it should be replaced.

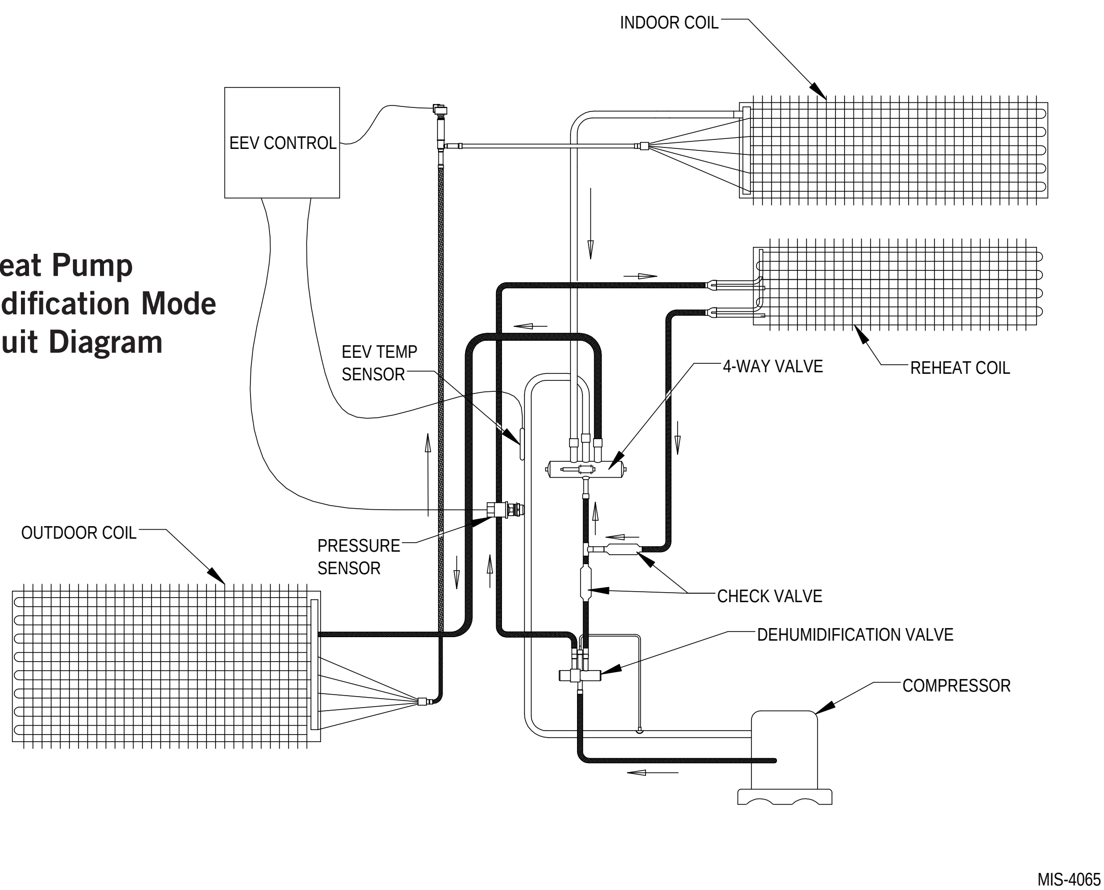
TABLE 2
10K Ohm NTC Sensor: Temperature/Resistance

Temperature		Resistance
F	C	Ω
-40	-40	188,500
-38.2	-39	178,500
-36.4	-38	169,000
-34.6	-37	160,200
-32.8	-36	151,900
-31	-35	144,100
-29.2	-34	136,700
-27.4	-33	129,800
-25.6	-32	123,300
-23.8	-31	117,100
-22	-30	111,300
-20.2	-29	105,700
-18.4	-28	100,500
-16.6	-27	95,520
-14.8	-26	90,840
-13	-25	86,430
-11.2	-24	82,260
-9.4	-23	78,330
-7.6	-22	74,610
-5.8	-21	71,100
-4	-20	67,770
-2.2	-19	64,570
-0.4	-18	61,540
1.4	-17	58,680
3.2	-16	55,970
5	-15	53,410
6.8	-14	50,980
8.6	-13	48,680
10.4	-12	46,500
12.2	-11	44,430
14	-10	42,470
15.8	-9	40,570
17.6	-8	38,770
19.4	-7	37,060
21.2	-6	35,440
23	-5	33,900
24.8	-4	32,440
26.6	-3	31,050
28.4	-2	29,730
30.2	-1	28,480
32	0	27,280
33.8	1	26,130
35.6	2	25,030
37.4	3	23,990
39.2	4	23,000
41	5	22,050
42.8	6	21,150
44.6	7	20,300
46.4	8	19,480
48.2	9	18,700
50	10	17,960
51.8	11	17,240
53.6	12	16,560
55.4	13	15,900
57.2	14	15,280
59	15	14,690
60.8	16	14,120
62.6	17	13,580
64.4	18	13,060
66.2	19	12,560
68	20	12,090
69.8	21	11,630
71.6	22	11,200
73.4	23	10,780
75.2	24	10,380
77	25	10,000
78.8	26	9,630
80.6	27	9,280
82.4	28	8,940
84.2	29	8,620
86	30	8,310
87.8	31	8,010
89.6	32	7,730
91.4	33	7,450
93.2	34	7,190
95	35	6,940
96.8	36	6,700
98.6	37	6,470
100.4	38	6,250
102.2	39	6,030
104	40	5,830
105.8	41	5,630
107.6	42	5,440
109.4	43	5,260
111.2	44	5,080
113	45	4,910
114.8	46	4,750
116.6	47	4,590
118.4	48	4,440
120.2	49	4,300
122	50	4,160
123.8	51	4,030
125.6	52	3,900
127.4	53	3,770
129.2	54	3,650
131	55	3,540
132.8	56	3,430
134.6	57	3,320
136.4	58	3,220
138.2	59	3,120
140	60	3,020
141.8	61	2,930
143.6	62	2,840
145.4	63	2,750
147.2	64	2,670
149	65	2,590
150.8	66	2,510
152.6	67	2,440
154.4	68	2,360
156.2	69	2,300
158	70	2,230
159.8	71	2,160
161.6	72	2,100
163.4	73	2,040
165.2	74	1,980
167	75	1,920
168.8	76	1,870
170.6	77	1,820
172.4	78	1,770
174.2	79	1,920
176	80	1,670
177.8	81	1,620
179.6	82	1,580
181.4	83	1,530
183.2	84	1,490
185	85	1,450
186.8	86	1,441
188.6	87	1,370
190.4	88	1,340
192.2	89	1,300
194	90	1,270
195.8	91	1,230
197.6	92	1,200
199.4	93	1,170
201.2	94	1,140
203	95	1,110
204.8	96	1,080
206.6	97	1,050
208.4	98	1,020
210.2	99	1,000
212	100	970

Heat Pump Cooling Mode Circuit Diagram



Heat Pump Dehumidification Mode Circuit Diagram



Q24H4D Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	75°F		85°F		95°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/64.1 (55% RH)	Total Cooling Btuh	25,100	10,000	23,500	6,300	21,600	1,900
	Sensible Btuh	18,200	3,000	17,500	300	16,800	(2,600)
	S/T	0.725	0.30	0.745	0.05	0.778	0
	Latent Btuh	6,900	7,000	6,000	6,000	4,800	4,500
	Lbs. H20/hr.	6.5	6.6	5.7	5.7	4.5	4.2
	Supply Air DB	55.1	70.6	55.9	74.7	56.7	78.9
	Supply Air WB	53.9	58.9	54.6	60.9	55.4	63.1
	Suction PSIG[3]	132	125	134	127	136	132
	Discharge PSIG[3]	303	265	345	295	392	327
75/65.5 (60% RH)	Total Cooling Btuh	26,000	10,900	24,300	7,500	22,500	3,200
	Sensible Btuh	17,300	4,500	16,400	1,800	15,700	(1,000)
	S/T	0.665	0.413	0.675	0.240	0.698	0
	Latent Btuh	8,700	6,400	7,900	5,700	6,800	4,200
	Lbs. H20/hr.	8.2	6.0	7.5	5.4	6.4	4.0
	Supply Air DB	56.1	71.6	57.0	75.6	57.9	79.9
	Supply Air WB	55.0	59.9	55.9	61.8	56.7	64.0
	Suction PSIG[3]	134	128	137	130	139	134
	Discharge PSIG[3]	224	268	320	298	367	330
75/66.7 (65% RH)	Total Cooling Btuh	26,900	12,200	25,200	8,700	23,400	4,400
	Sensible Btuh	16,200	6,100	15,400	3,300	14,600	500
	S/T	0.602	0.50	0.611	0.38	0.624	0.11
	Latent Btuh	10,700	6,100	9,800	5,400	8,800	3,900
	Lbs. H20/hr.	10.1	5.8	9.2	5.1	8.3	3.7
	Supply Air DB	57.3	72.6	58.2	76.6	59.0	80.8
	Supply Air WB	56.3	60.8	57.2	62.7	58.0	64.9
	Suction PSIG[3]	137	131	139	133	141	137
	Discharge PSIG[3]	199	271	294	300	342	333

1 Values listed are with ventilation package disabled

2 Return air temperature °F @ Default airflow (825 CFM) for AC tests and Balanced Climate airflow (600 CFM) for dehumidification tests

3 Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

Q30H4D Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	75°F		85°F		95°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/64.1 (55% RH)	Total Cooling Btuh	29,700	11,900	28,100	7,900	26,600	4,100
	Sensible Btuh	20,400	3,300	19,700	200	19,300	(2,800)
	S/T	0.687	0.28	0.701	0.03	0.726	0
	Latent Btuh	9,300	8,600	8,400	7,700	7,300	6,900
	Lbs. H20/hr.	8.8	8.1	7.9	7.3	6.9	6.5
	Supply Air DB	53.5	70.7	54.3	74.8	55.3	78.8
	Supply Air WB	52.4	58.5	53.1	60.5	54.0	62.4
	Suction PSIG[3]	125	123	127	127	130	130
	Discharge PSIG[3]	314	274	358	304	406	336
75/65.5 (60% RH)	Total Cooling Btuh	30,700	12,800	28,900	8,900	27,400	5,100
	Sensible Btuh	19,300	2,600	18,500	(500)	18,000	(3,500)
	S/T	0.629	0.203	0.640	0	0.657	0
	Latent Btuh	11,400	10,200	10,400	9,400	9,400	8,600
	Lbs. H20/hr.	10.8	9.6	9.8	8.9	8.9	8.1
	Supply Air DB	54.8	71.6	55.5	75.7	56.5	79.7
	Supply Air WB	53.7	59.6	54.5	61.5	55.4	63.4
	Suction PSIG[3]	128	126	131	130	133	133
	Discharge PSIG[3]	316	277	360	307	408	339
75/66.7 (65% RH)	Total Cooling Btuh	31,500	13,800	29,700	10,000	28,200	6,200
	Sensible Btuh	18,000	1,900	17,200	(1,300)	16,700	(4,300)
	S/T	0.571	0.14	0.579	0	0.592	0
	Latent Btuh	13,500	11,900	12,500	11,300	11,500	10,500
	Lbs. H20/hr.	12.7	11.2	11.8	10.7	10.8	9.9
	Supply Air DB	56.1	72.5	56.8	76.7	57.8	80.7
	Supply Air WB	55.1	60.6	55.9	62.6	56.8	64.5
	Suction PSIG[3]	131	129	134	133	137	136
	Discharge PSIG[3]	318	279	362	310	410	341

1 Values listed are with ventilation package disabled

2 Return air temperature °F @ Default airflow (900 CFM) for AC tests and Balanced Climate airflow (650 CFM) for dehumidification tests

3 Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

Q36H4D Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	75°F		85°F		95°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/64.1 (55% RH)	Total Cooling Btuh	34,800	14,800	32,700	11,000	31,200	6,500
	Sensible Btuh	23,100	3,400	22,300	100	23,600	(3,300)
	S/T	0.664	0.23	0.682	0.01	0.756	0
	Latent Btuh	11,700	11,400	10,400	10,900	7,600	9,800
	Lbs. H20/hr.	11.0	10.8	9.8	10.3	7.2	9.2
	Supply Air DB	55.2	71.2	56.0	74.9	56.7	78.8
	Supply Air WB	53.2	58.2	53.8	59.9	54.5	61.7
	Suction PSIG[3]	131	120	133	123	135	125
	Discharge PSIG[3]	335	282	382	312	432	345
75/65.5 (60% RH)	Total Cooling Btuh	38,100	15,300	33,600	12,000	32,100	7,500
	Sensible Btuh	22,900	2,200	20,700	(700)	22,000	(4,200)
	S/T	0.601	0.144	0.616	0	0.685	0
	Latent Btuh	15,200	13,100	12,900	12,700	10,100	11,700
	Lbs. H20/hr.	14.3	12.4	12.2	12.0	9.5	11.0
	Supply Air DB	56.3	72.3	57.3	75.9	58.0	79.7
	Supply Air WB	54.6	59.1	55.3	61.0	56.0	62.7
	Suction PSIG[3]	134	124	136	126	138	128
	Discharge PSIG[3]	338	289	384	315	434	348
75/66.7 (65% RH)	Total Cooling Btuh	39,000	16,300	34,600	13,000	33,100	8,500
	Sensible Btuh	21,300	1,300	19,100	(1,600)	20,400	(5,000)
	S/T	0.546	0.08	0.552	0	0.616	0
	Latent Btuh	17,700	15,000	15,500	14,600	12,700	13,500
	Lbs. H20/hr.	16.7	14.2	14.6	13.8	12.0	12.7
	Supply Air DB	57.6	73.2	58.6	76.9	59.3	80.7
	Supply Air WB	56.1	60.2	56.8	62.1	57.5	63.8
	Suction PSIG[3]	136	127	138	128	141	131
	Discharge PSIG[3]	340	293	386	319	437	352

1 Values listed are with ventilation package disabled

2 Return air temperature °F @ Default airflow (1125 CFM) for AC tests and Balanced Climate airflow (825 CFM) for dehumidification tests

3 Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

Q43H4D Cooling and Dehumidification Application Data[1]

DB/WB[2]	OD Temp.	75°F		85°F		95°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/64.1 (55% RH)	Total Cooling Btuh	42,600	16,800	40,200	11,400	37,700	5,600
	Sensible Btuh	29,300	3,500	28,100	(600)	27,000	(4,800)
	S/T	0.688	0.21	0.699	0	0.716	0
	Latent Btuh	13,300	13,300	12,100	12,000	10,700	10,400
	Lbs. H20/hr.	12.5	12.5	11.4	11.3	10.1	9.8
	Supply Air DB	54.8	71.9	55.5	76.0	56.3	80.2
	Supply Air WB	53.2	58.2	53.8	60.2	54.5	62.3
	Suction PSIG[3]	131	121	135	126	138	130
	Discharge PSIG[3]	325	278	371	308	420	340
75/65.5 (60% RH)	Total Cooling Btuh	43,500	18,000	41,300	12,600	38,800	6,700
	Sensible Btuh	27,900	2,700	26,300	(1,500)	25,300	(5,700)
	S/T	0.641	0.150	0.637	0	0.652	0
	Latent Btuh	15,600	15,300	15,000	14,100	13,500	12,400
	Lbs. H20/hr.	14.7	14.4	14.2	13.3	12.7	11.7
	Supply Air DB	55.9	72.8	56.8	77.0	57.5	81.2
	Supply Air WB	54.4	59.3	55.3	61.2	56.0	63.3
	Suction PSIG[3]	134	124	138	129	141	133
	Discharge PSIG[3]	327	281	373	311	422	343
75/66.7 (65% RH)	Total Cooling Btuh	44,600	19,100	42,300	13,700	39,800	7,900
	Sensible Btuh	26,100	1,800	24,600	(2,400)	23,500	(6,500)
	S/T	0.585	0.09	0.582	0	0.590	0
	Latent Btuh	18,500	17,300	17,700	16,100	16,300	14,400
	Lbs. H20/hr.	17.5	16.3	16.7	15.2	15.4	13.6
	Supply Air DB	57.2	73.8	58.1	77.9	58.8	82.1
	Supply Air WB	55.8	60.3	56.7	62.2	57.4	64.3
	Suction PSIG[3]	137	127	141	131	144	136
	Discharge PSIG[3]	329	284	375	314	424	346

1 Values listed are with ventilation package disabled
2 Return air temperature °F @ Default airflow (1300 CFM) for AC tests and Balanced Climate airflow (910 CFM) for dehumidification tests
3 Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

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DB/WB[2]	OD Temp.	75°F		85°F		95°F	
	Mode	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/64.1 (55% RH)	Total Cooling Btuh	48,900	18,500	46,200	12,600	43,400	6,400
	Sensible Btuh	33,900	3,700	32,600	(700)	31,400	(5,000)
	S/T	0.693	0.20	0.706	0	0.724	0
	Latent Btuh	15,000	14,800	13,600	13,300	12,000	11,400
	Lbs. H20/hr.	14.2	14.0	12.8	12.5	11.3	10.8
	Supply Air DB	55.0	72.1	55.7	76.0	56.4	79.9
	Supply Air WB	53.3	58.4	53.9	60.3	54.6	62.3
	Suction PSIG[3]	129	119	132	122	135	124
	Discharge PSIG[3]	345	293	391	322	441	353
75/65.5 (60% RH)	Total Cooling Btuh	49,900	19,900	47,300	14,000	44,400	7,800
	Sensible Btuh	32,000	2,500	30,600	(1,800)	29,300	(6,200)
	S/T	0.641	0.126	0.647	0	0.660	0
	Latent Btuh	17,900	17,400	16,700	15,800	15,100	14,000
	Lbs. H20/hr.	16.9	16.4	15.8	14.9	14.2	13.2
	Supply Air DB	56.2	73.1	56.9	77.1	57.6	81.0
	Supply Air WB	54.7	59.3	55.3	61.4	56.0	63.4
	Suction PSIG[3]	131	122	134	125	138	127
	Discharge PSIG[3]	347	297	394	326	444	357
75/66.7 (65% RH)	Total Cooling Btuh	50,900	21,300	48,300	15,500	45,500	9,300
	Sensible Btuh	29,900	1,400	28,600	(3,000)	27,300	(7,300)
	S/T	0.587	0.07	0.592	0	0.600	0
	Latent Btuh	21,000	19,900	19,700	18,500	18,200	16,600
	Lbs. H20/hr.	19.8	18.8	18.6	17.5	17.2	15.7
	Supply Air DB	57.4	74.2	58.2	78.2	58.9	82.1
	Supply Air WB	56.1	60.4	56.8	62.5	57.5	64.4
	Suction PSIG[3]	134	125	137	128	141	131
	Discharge PSIG[3]	350	300	396	330	446	360

1 Values listed are with ventilation package disabled

2 Return air temperature °F @ Default airflow (1500 CFM) for AC tests and Balanced Climate airflow (1050 CFM) for dehumidification tests

3 Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

TABLE 3
Dehumidification Relay Logic Board

Energize on Unit Terminal Strip	Mode	Occupied/ Unoccupied	Inputs to the Board					Outputs from the Board			
			Y	B	W2	A1	D	RV	TWV	YO	G1
Y1, G	1st Stage Cooling	Unoccupied	X							X	X
Y1, G, A	1st Stage Cooling	Occupied	X			X				X	X
Y1, G, A, D	1st Stage Cooling w/Dehum ①	Occupied	X			X	X			X	X
Y1, G, D	1st Stage Cooling w/Dehum ①	Unoccupied	X				X			X	X
Y1, G, B/W1	1st Stage Heat Pump	Unoccupied	X	X				X		X	X
Y1, G, B/W1, A	1st Stage Heat Pump	Occupied	X	X		X		X		X	X
Y1, G, B/W1, A, D	1st Stage Heat Pump w/Dehum ②	Occupied	X	X		X	X		X	X	X
Y1, G, B/W1, D	1st Stage Heat Pump w/Dehum	Unoccupied	X	X			X	X		X	X
Y1, G, B/W1, W2	2nd Stage Heat Pump w/Strips	Unoccupied	X	X	X			X		X	X
Y1, G, B/W1, W2, A	2nd Stage Heat Pump w/Strips	Occupied	X	X	X	X		X		X	X
Y1, G, B/W1, W2, A, D	2nd Stage Heat Pump w/Strips and Dehum ③	Occupied	X	X	X	X	X	X		X	X
Y1, G, B/W1, W2, D	2nd Stage Heat Pump w/Strips and Dehum ③	Unoccupied	X	X	X		X	X		X	X
D	Dehum	Unoccupied					X		X ④	X ④	X ④
D, A	Dehum	Occupied				X	X		X	X	X

① Cooling takes precedence over dehumidification. A cooling call cancels dehumidification.

② When occupied (for either jumper position), dehumidification takes precedence over first stage heating.

③ A second stage heating call always takes precedence over dehumidification.

④ The relay logic board has a jumper (J1) on it to choose between “any-time dehumidification” and “occupied dehumidification”. The factory default is P1-P2. With the jumper in the P1-P2 position, dehumidification is available any time there is a “D” input to the relay logic board. With the jumper in the P2-P3 position, dehumidification is available when there is an occupancy signal to the “A1” terminal, “D” would also need to be energized to dehumidify.

Refer to sequence of operation. In most cases cooling and heating modes take priority over dehumidification.

TABLE 4
Electrical Specifications – Q**H4D Series

Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Dual Circuit							
			① Minimum Circuit Ampacity	② Maximum External Fuse or Ckt. Brkr.	③ Field Power Wire Size	③ Ground Wire	① Minimum Circuit Ampacity		② Maximum External Fuse or Ckt. Breaker		③ Field Power Wire Size		③ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
Q24H4DA0Z	230/208-1	1	24	35	8	10								
DA05		1	50	50	8	10								
Q24H4DB0Z	230/208-3	1	16	20	12	12								
DB06		1	34	35	8	10								
DB09		1	43	45	8	10								
Q24H4DC0Z	460-3	1	9	10	14	14								
DC06		1	18	20	12	12								
DC09		1	23	25	10	10								
Q30H4DA0Z	230/208-1	1	27	35	8	10								
DA05		1	53	60	6	10								
Q30H4DB0Z	230/208-3	1	20	25	10	10								
DB06		1	38	40	8	10								
DB09		1	48	50	8	10								
Q30H4DC0Z	460-3	1	10	15	14	14								
DC06		1	19	20	12	12								
DC09		1	24	25	10	10								
Q36H4DA0Z	230/208-1	1	27	40	8	10								
DA05		1	53	60	6	10								
DA10		1 or 2	79	80	4	8	53	26	60	30	6	10	10	10
Q36H4DB0Z	230/208-3	1	22	25	10	10								
DB06		1	40	45	8	10								
DB09		1	49	50	8	10								
④ DB15		1	52	60	6	10								
Q36H4DC0Z	460-3	1	12	15	14	14								
DC06		1	21	25	10	10								
DC09		1	25	25	10	10								
④ DC15		1	26	30	10	10								
Q43H4DA0Z	230/208-1	1	33	40	8	10								
DA05		1	59	60	6	10								
DA10		1 or 2	85	90	4	8	59	26	60	30	8	6	10	10
Q43H4DB0Z	230/208-3	1	26	30	10	10								
DB06		1	44	50	8	10								
DB09		1	53	60	6	10								
④ DB15		1	53	60	6	10								
Q43H4DC0Z	460-3	1	12	15	14	14								
DC06		1	21	20	12	12								
DC09		1	25	25	10	10								
④ DC15		1	26	30	10	10								
Q48H4DA0Z	230/208-1	1	35	40	8	10								
DA05		1	60	60	6	10								
DA10		1 or 2	87	90	3	8	35	52	40	60	8	6	10	10
④ DA15		1 or 2	87	90	3	8	35	52	40	60	8	6	10	10
Q48H4DB0Z	230/208-3	1	27	30	10	10								
DB06		1	45	50	8	10								
DB09		1	54	60	6	10								
④ DB15		1	54	60	6	10								
Q48H4DC0Z	460-3	1	12	15	14	14								
DC06		1	21	25	10	10								
DC09		1	26	30	10	10								
④ DC15		1	26	30	10	10								

① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing. ***CAUTION:*** *When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.*

② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.

③ Based on 75°copper wire. All wiring must conform to the National Electrical Code and all local codes.

④ Maximum KW that can operate with the heat pump on is 9KW. Full heat available during emergency heat mode.

NOTE: *The Maximum Overcurrent Protection (MOCP) value listed is the maximum value as per UL 1995 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory-installed overcurrent protective device (circuit breaker) in this model may be lower than the maximum UL 1995 allowable MOCP value, but still above the UL 1995 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.*

IMPORTANT: *While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.*