Supplemental Instructions

Models:

Q24H3D Q30H3D Q36H3D Q43H3D Q48H3D Q60H3D

This model provides a unique dehumidification circuit for periods of high indoor humidity conditions. Additionally an "energy recovery ventilator" may be provided to allow for outside ventilation air requirements by eliminating excessive sensible and latent loads as a result of the increased ventilation requirement.

Refer to specification sheet S3535 for the standard features of the base unit Q**H3D Q-TEC™. Electrical data for the Q**H dehumidification Q-TEC™ models is identical to the electrical data for the standard Q**H models.

Dehumidification Circuit

The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream in addition to the standard evaporator coil. This coil reheats the supply air after it passes over the cooling coil, and is sized to nominally match the sensible cooling capacity of the evaporator coil. Extended run times in dehumidification mode can be achieved using waste heat from the refrigeration cycle to achieve the reheat process, while at the same time large amounts of moisture can be extracted from the passing air stream. Models that also have electric heaters installed have the electric heat inhibited during dehumidification mode, although it remains available for additional reheat during certain conditions. See page 2 for specific operating sequences, and see attached tables for performance on sensible and latent capacities, water removal ratings and supply air delivery conditions.

The dehumidification refrigerant reheat circuit is controlled by a 3-way valve directing the refrigerant gas to the normal condenser during periods when standard air conditioning is required. During periods of time at low ambient temperature (approximately 65°F to 75°F outdoor) and high indoor humidity, a humidistat senses the need for mechanical dehumidification. It then energizes both the compressor circuit and the 3-way 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. A small capillary tube inserted between the reheat coil return line and suction line will prevent liquid from accumulating in the reheat coil when it is inactive. This drain does not affect the normal operation of the system. A check valve is located in the reheat coil return line. It has a soft spring to hold the ball on the seat. Refer to page 3 for the location of the check valve and drain back capillary. When the humidistat is satisfied, the system automatically switches back to normal A/C mode 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.

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Manual: 7960-768
Supersedes: ***NEW***
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Dehumidification Sequence of Operation

Dehumidification is controlled through a humidistat and is independent of the thermostat. On a call for dehumidification mode of operation, the compressor and 3-way valve that feeds the reheat coil are energized through circuit 4-5. Dehumidification will continue until the humidistat is satisfied.

If the room temperature falls below the 1st stage heating setpoint, electric heat will be energized by the room thermostat and cycle to maintain room temperature.

If the 2nd stage heating setpoint is reached, dehumidification cycle is de-energized and heat pump heating is energized.

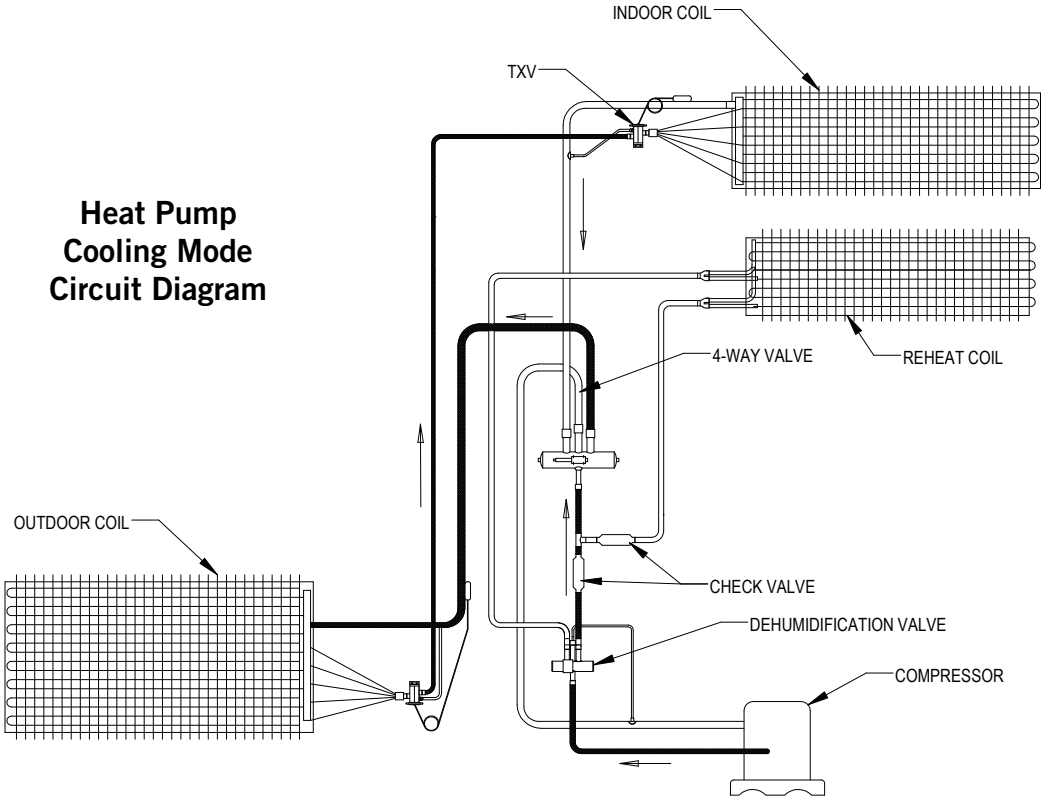
If the mixed (return and ventilation, if used) temperature (measured at the internal filter location) drops below 65°F during dehumidification cycle, electric heat will cycle to help maintain room temperature to the 65°F condition.

NOTE: *On installations with ventilation package installed and controlled from the O1 terminal on Bard 24V terminal strip, this feature is inhibited anytime the O1 terminal is energized.*

If the unit is operating in heat pump mode and there is a call for dehumidification, the dehumidification mode takes precedence over the heat pump heating mode. The unit will not return to heating mode until 2nd stage heating is called for.

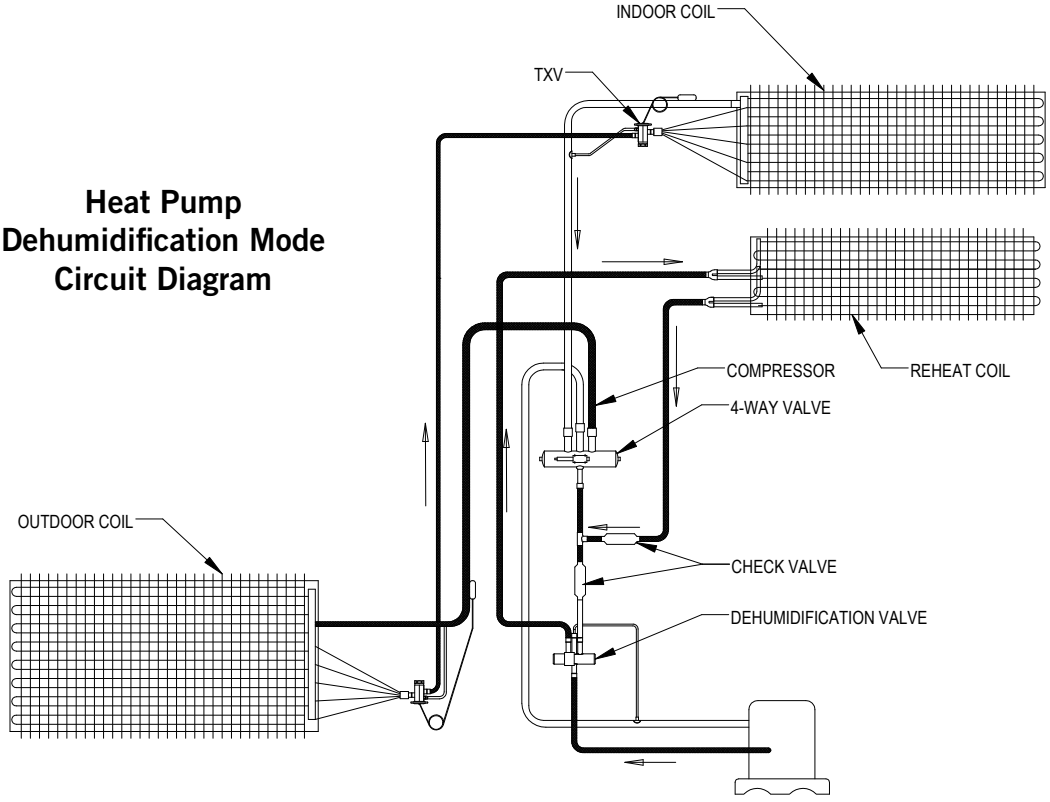
Anytime there is a R-Y call for cooling, dehumidification is canceled and the unit will operate in the cooling mode until satisfied. If dehumidification call is still present when cooling call is satisfied, the unit will continue to operate and revert to dehumidification mode.

Heat Pump Cooling Mode Circuit Diagram



MIS-3805

Heat Pump Dehumidification Mode Circuit Diagram



MIS-3806

Q24H3D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Airflow	Approximate Supply Air	Mode
DB/WB	% RH	DB	Total	Sensible	Latent	S/T	Lbs.	CFM	DB/WB	A/C vs. Dehum
65/63	90	65	27,200	11,200	16,000	0.41	15.10	800	52.4/51.8	A/C
65/63	90	65	15,200	500	14,700	0.03	13.91	800	64.4/57.1	Dehum
75/62.5	50	75	25,100	18,400	6700	0.73	6.30	800	54.5/51.6	A/C
75/62.5	50	75	10,700	5200	5500	0.49	5.15	800	69.1/58.1	Dehum
75/65.5	60	75	26,700	16,300	10,400	0.61	9.88	800	56.8/54.7	A/C
75/65.5	60	75	12,900	3700	9200	0.29	8.68	800	70.9/60.6	Dehum
75/68	70	75	28,200	14,400	13,800	0.51	12.98	800	59.0/57.4	A/C
75/68	70	75	14,600	2200	12,400	0.15	11.67	800	72.6/57.3	Dehum
80/67	50	95	25,000	17,800	7200	0.71	6.82	800	60.3/57.3	A/C
80/67	50	95	8000	2000	6000	0.25	5.68	800	77.8/64.0	Dehum

Q30H3D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Airflow	Approximate Supply Air	Mode
DB/WB	% RH	DB	Total	Sensible	Latent	S/T	Lbs.	CFM	DB/WB	A/C vs. Dehum
65/63	90	65	33,195	14,060	19,135	0.42	18.05	1000	52.38/51.64	A/C
65/63	90	65	19,095	876	18,219	0.05	17.19	1000	64.66/64.31	Dehum
75/62.5	50	75	31,111	23,164	7947	0.74	7.5	1000	54.32/52.07	A/C
75/62.5	50	75	13,816	7052	6764	0.51	6.38	1000	68.72/58.37	Dehum
75/65	60	75	32,957	20,386	12,571	0.62	11.86	1000	65.51/56.86	A/C
75/65	60	75	16,045	4721	11,324	0.29	10.68	1000	70.81/60.88	Dehum
75/68	70	75	34,315	17,674	16,641	0.52	15.7	1000	67.95/59.12	A/C
75/68	70	75	17,890	2668	15,222	0.15	14.36	1000	72.56/62.97	Dehum
80/67	50	95	7896	1510	6386	0.19	6.02	1000	78.6/64.6	Dehum
78/64		95	28,006	22,790	5216	0.81	4.92	1000	63.93/57.31	A/C
78/64		95	5959	2054	3905	0.34	3.68	1000	76.1/62.09	Dehum

Q36H3D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Airflow	Approximate Supply Air	Mode
DB/WB	% RH	DB	Total	Sensible	Latent	S/T	Lbs.	CFM	DB/WB	A/C vs. Dehum
65/63	90	65	36,638	21,587	15,051	0.59	14.2	1250	53.94/53.11	A/C
65/63	90	65	13,966.49	-3809	17,775.49	0	16.77	1000	68.37/58.85	Dehum
75/62.5	50	75	34,106	26,480	7626	0.78	7.19	1250	55.55/52.85	A/C
75/62.5	50	75	8687	1557	7130	0.18	6.73	1000	73.59/59.78	Dehum
75/65	60	75	36,110	22,929	13,181	0.63	12.43	1250	58.18/56.03	A/C
75/65	60	75	10,621	-217	10,838	0	10.22	1000	75.27/62.43	Dehum
75/68	70	75	37,963	19,526	18,437	0.51	17.39	1250	60.4/58.69	A/C
75/68	70	75	12,936	-2086	15,022	0	14.17	1000	77.01/64.48	Dehum
80/67	50	95	1086	-4632	5718	0	5.39	1000	84.18/66.7	Dehum
78/64		95	30,305	5070	25,235	0.17	23.81	1250	59.27/55.81	A/C
78/64		95	-600	-4627	4027	7.71	3.8	1000	82.13/64.21	Dehum

Q43H3D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Airflow	Approximate Supply Air	Mode
DB/WB	% RH	DB	Total	Sensible	Latent	S/T	Lbs.	CFM	DB/WB	A/C vs. Dehum
65/63	90	65	45,144	18,774	26,370	0.42	24.88	1200	51.1/50.2	A/C
65/63	90	65	19,834	-3023	22,857	0	21.56	1000	67.8/56.7	Dehum
75/62.5	50	75	42,778	30,697	12,081	0.72	11.4	1200	52.2/50.0	A/C
75/62.5	50	75	13,904	20	13,884	0	13.1	1000	72.5/58.0	Dehum
75/65	60	75	45,187	18,346	26,841	0.41	25.32	1200	54.9/53.2	A/C
75/65	60	75	16,317	480	15,837	0.03	14.94	1000	74.6/60.5	Dehum
75/68	70	75	47,350	23,795	23,555	0.5	22.22	1200	57.4/55.9	A/C
75/68	70	75	18,875	-1489	20,364	0	19.21	1000	76.4/62.6	Dehum
80/67	50	95	6100	-4800	10,900	0	10.28	1000	84.4/66.7	Dehum
78/64		95	39,557	30,438	9119	0.77	8.6	1200	55.2/52.8	A/C
78/64		95	3651	-4123	7774	0	7.33	1000	81.8/62.8	Dehum

Q48H3D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Airflow	Approximate Supply Air	Mode
DB/WB	% RH	DB	Total	Sensible	Latent	S/T	Lbs.	CFM	DB/WB	A/C vs. Dehum
65/63	90	65	52,495	21,993	30,502	0.42	28.78	1250	48.99/48.19	A/C
65/63	90	65	20,043	-5580	25,623	0	24.17	1250	69.14/57.78	Dehum
75/62.5	50	75	49,227	34,098	15,129	0.69	14.27	1250	50.29/48.41	A/C
75/62.5	50	75	13,618	2135	11,483	0.16	10.83	1250	73.36/58.93	Dehum
75/65	60	75	52,025	30,124	21,901	0.58	20.66	1250	53.08/51.48	A/C
75/65	60	75	17,100	-662	17,762	0	16.76	1250	75.54/61.32	Dehum
75/68	70	75	54,394	26,854	27,540	0.49	25.98	1250	55.3/53.96	A/C
75/68	70	75	19,566	-3227	22,893	0	21.6	1250	77.55/63.5	Dehum
80/67	50	95	6162	-5940	12,102	0	11.42	1250	84.41/65.63	Dehum
78/64		95	45,884	33,810	12,074	0.74	11.39	1250	53.9/51.68	A/C
78/64		95	3281	-5309	8590	0	8.1	1250	82.03/63.17	Dehum

Q60H3D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Airflow	Approximate Supply Air	Mode
DB/WB	% RH	DB	Total	Sensible	Latent	S/T	Lbs.	CFM	DB/WB	A/C vs. Dehum
65/63	90	65	58,123	25,157	32,966	0.43	31.1	1580	50.99/50.18	A/C
65/63	90	65	36,358	7121	29,237	0.2	27.58	1278	60.49/53.45	Dehum
75/62.5	50	75	55,712	40,185	15,527	0.72	14.65	1580	52.15/49.92	A/C
75/62.5	50	75	30,145	16,483	13,662	0.55	12.89	1286	63.3/54.55	Dehum
75/65	60	75	58,558	35,281	23,277	0.6	21.96	1580	55.03/53.12	A/C
75/65	60	75	33,242	12,947	20,295	.039	19.15	1283	66.26/57.28	Dehum
75/68	70	75	60,840	31,220	29,620	0.51	27.94	1580	57.44/55.81	A/C
75/68	70	75	35,718	9985	25,733	0.28	24.28	1284	68.51/59.65	Dehum
80/67	50	95	24,503	14,356	10,147	0.59	9.57	1284	73.16/61.27	Dehum
78/64		95	51,512	39,254	12,258	0.76	11.56	1570	55.7/52.83	A/C
78/64		95	21,818	11,269	10,549	0.52	9.95	1288	70.26/58.57	Dehum

Electrical Specifications – Dehumidification Models

MODEL	Rated Volts & Phase	No. Field Power Circuits	Single Circuit				Dual Circuit							
			③ Minimum Circuit Ampacity	① Maximum External Fuse or Ckt. Brkr.	② Field Power Wire Size	② Ground Wire	③ Minimum Circuit Ampacity		① Maximum External Fuse or Ckt. Breaker		② Field Power Wire Size		② Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
Q24H3DA0Z	230/208-1	1	22	30	10	10								
A05		1	47	50	8	10								
A10		1 or 2	72	80	4	8	22	50	30	50	10	8	10	10
Q24H3DB0Z	230/208-3	1	17	20	12	12								
B06		1	35	35	8	10								
B09		1	44	45	8	10								
Q24H3DC0Z	460-3	1	10	15	14	14								
C06		1	19	20	12	12								
C09		1	23	25	10	10								
Q30H3DA0Z	230/208-1	1	27	35	8	10								
A05		1	52	60	6	10								
A10		1 or 2	77	80	4	8	27	50	30	50	10	8	10	10
Q30H3DB0Z	230/208-3	1	19	25	10	10								
B06		1	38	40	8	10								
B09		1	47	50	8	10								
B12		1	56	60	6	10								
Q30H3DC0Z	460-3	1	13	15	14	14								
C06		1	22	25	10	10								
C09		1	26	30	10	10								
C12		1	31	35	8	10								
Q36H3DA0Z	230/208-1	1	29	40	8	10								
A05		1	55	60	6	10								
A10		1 or 2	79	80	4	8	29	50	45	50	8	8	10	10
④ A15		1 or 2	82	90	4	8	32	50	45	50	8	8	10	10
Q36H3DB0Z	230/208-3	1	21	30	10	10								
B06		1	39	45	8	10								
B09		1	48	50	8	10								
⑤ B15		1	52	60	6	10								
Q36H3DC0Z	460-3	1	13	15	14	14								
C06		1	22	25	10	10								
C09		1	27	30	10	10								
⑤ C15		1	27	30	10	10								
Q43H3DA0Z	230/208-1	1	31	45	8	10								
A05		1	57	60	6	10								
A10		1 or 2	81	90	4	8	31	50	45	50	8	8	10	10
④ A15		1 or 2	81	90	4	8	33	50	45	50	8	8	10	10
Q43H3DB0Z	230/208-3	1	26	35	8	10								
B06		1	44	50	8	10								
B09		1	53	60	6	10								
⑤ B15		1	53	60	6	10								
Q43H3DC0Z	460-3	1	13	15	14	14								
C06		1	22	25	10	10								
C09		1	27	30	10	10								
⑤ C15		1	27	30	10	10								
Q48H3DA0Z	230/208-1	1	37	50	8	10								
A05		1 or 2	62	70	6	8	37	25	50	25	8	10	10	10
A10		1 or 2	87	90	3	8	37	50	50	50	8	8	10	10
④ A15		1 or 2	87	90	3	8	37	50	50	50	8	8	10	10
Q48H3DB0Z	230/208-3	1	28	40	8	10								
B06		1	47	50	8	10								
B09		1	56	60	6	10								
⑤ B15		1	56	60	6	10								
Q48H3DC0Z	460-3	1	16	20	12	12								
C06		1	25	25	10	10								
C09		1	29	30	10	10								
⑤ C15		1	29	30	10	10								
Q60H3DA0Z	230/208-1	1	42	60	8	10								
A05		1 or 2	67	80	4	8	42	25	60	25	8	10	10	10
A10		1 or 2	92	100	3	8	42	50	60	50	8	8	10	10
⑤ A15		1 or 2	92	100	3	8	42	50	60	50	8	8	10	10
Q60H3DB0Z	230/208-3	1	32	45	8	10								
B09		1	59	60	6	10								
⑤ B15		1	59	60	6	10								
Q60H3DC0Z	460-3	1	16	20	12	12								
C09		1	31	35	8	10								
⑤ C15		1	31	35	8	10								

① Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.

② Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.

③ These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electric Code (latest revision), article 310 for power conductor sizing.

CAUTION: When more than one field power conductor 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 conductors are in a raceway.

④ Maximum KW that can operate with heat pump on is 10KW. Other 5KW energizes during emergency heating only.

⑤ Maximum KW that can operate with heat pump on is 9KW. Other 6KW energizes during emergency heating only.