MODELS:

QH244D, QH303D, QH363D, QH423D, QH483D, QH603D

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506

MODEL FEATURES

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 S3349 for the standard features of the base unit QH Q/Tec. Electrical data for the QH dehumidification Q/Tec models is identical to the electrical data for the standard QH models.

SPECIAL FEATURES

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 below 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 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 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 2 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.

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

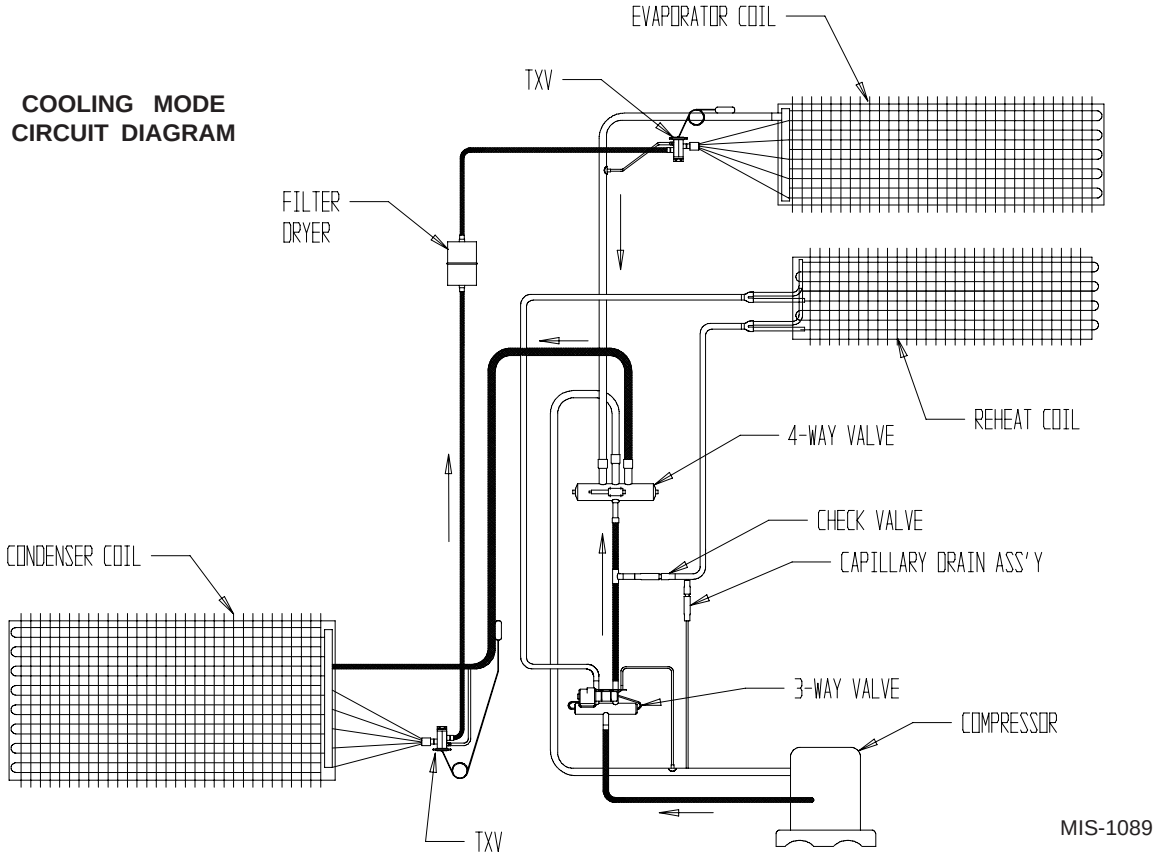
If 2nd stage heating setpoint is reached, dehumidification cycle is de-energized and heat pump heating is energized.

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.

COOLING MODE CIRCUIT DIAGRAM



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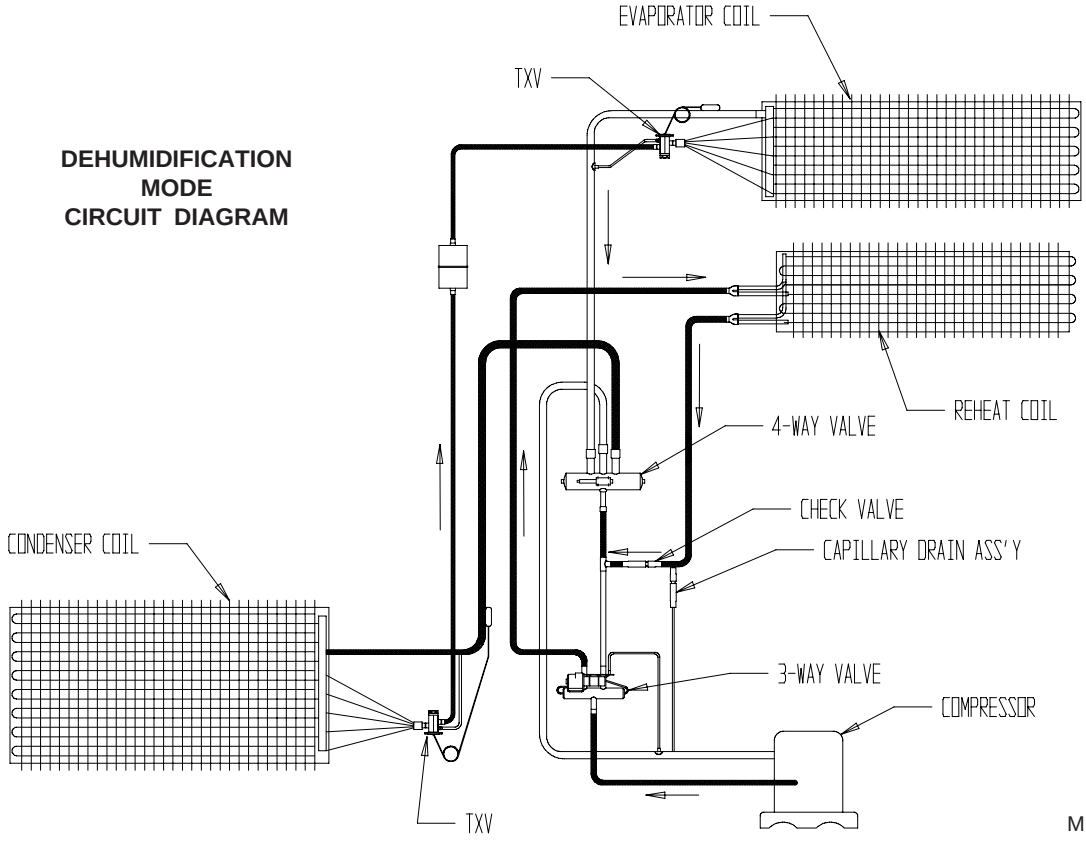
DEHUMIDIFICATION MODE CIRCUIT DIAGRAM



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QH244D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Air Flow	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	26,000	11,600	14,400	0.44	13.60	800	51.8 / 51.4	A/C
65/63	90	65	13,000	-0-	13,000	-0-	12.30	500	65.8 / 54.6	Dehum
75/62.5	50	75	25,700	18,200	7,500	0.71	7.00	800	53.5 / 50.9	A/C
75/62.5	50	75	11,700	3,200	8,500	0.28	8.00	500	69.6 / 55.5	Dehum
75/65.5	60	75	27,200	16,200	11,000	0.60	10.30	800	56.3 / 54.1	A/C
75/65.5	60	75	13,300	1,800	11,500	0.13	10.90	500	71.9 / 57.9	Dehum
75/68	70	75	28,700	14,200	14,500	0.49	13.70	800	58.6 / 56.5	A/C
75/68	70	75	14,500	-0-	14,500	-0-	13.70	500	75.0 / 61.0	Dehum
80/67	50	95	25,000	16,700	8,300	0.67	7.83	800	59.2 / 56.2	A/C
80/67	50	95	9,300	-0-	9,300	-0-	8.80	500	80.0 / 62.2	Dehum

Rated CFM 800

QH303D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Air Flow	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	31,000	12,500	18,500	0.40	16.00	1000	53.0 / 52.1	A/C
65/63	90	65	18,500	-0-	18,500	-0-	16.00	700	67.9 / 56.7	Dehum
75/62.5	50	75	30,200	21,900	8,300	0.72	7.40	1000	54.7 / 52.0	A/C
75/62.5	50	75	12,400	3,200	9,200	0.26	8.40	700	71.0 / 57.3	Dehum
75/65.5	60	75	31,400	18,900	12,450	0.60	10.50	1000	57.3 / 54.8	A/C
75/65.5	60	75	12,900	-0-	12,900	-0-	12.20	700	74.1 / 60.2	Dehum
75/68	70	75	32,700	16,500	16,200	0.50	15.20	1000	59.6 / 57.6	A/C
75/68	70	75	16,200	-0-	16,200	-0-	15.20	700	76.1 / 61.9	Dehum
80/67	50	95	30,000	22,100	7,900	0.74	7.45	1000	60.3 / 57.4	A/C
80/67	50	95	9,500	-0-	9,500	-0-	9.00	700	80.0 / 63.5	Dehum

Rated CFM 1000

QH363D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Air Flow	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	36,100	14,500	21,700	0.40	20.40	1000	52.3 / 51.2	A/C
65/63	90	65	21,700	-0-	21,700	-0-	20.40	850	72.0 / 58.0	Dehum
75/62.5	50	75	35,200	25,300	9,900	0.72	9.30	1000	54.0 / 51.1	A/C
75/62.5	50	75	14,500	3,800	10,700	0.26	10.00	850	73.0 / 59.0	Dehum
75/65.5	60	75	36,000	21,000	15,100	0.58	14.20	1000	56.2 / 54.2	A/C
75/65.5	60	75	15,100	-0-	15,100	-0-	14.20	850	78.4 / 61.2	Dehum
75/68	70	75	37,500	18,000	19,500	0.48	18.40	1000	58.2 / 56.5	A/C
75/68	70	75	19,500	-0-	19,500	-0-	18.40	850	79.0 / 62.0	Dehum
80/67	50	95	36,000	25,725	10,275	0.72	9.69	1200	60.6 / 57.9	A/C
80/67	50	95	34,400	23,400	11,000	0.68	10.40	1000	59.6 / 57.0	A/C
80/67	50	95	11,500	-0-	11,500	-0-	10.80	850	83.0 / 64.0	Dehum

Rated CFM 1200. Shipped from the factory on optional CFM of 1000.

QH423D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Air Flow	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	40,000	15,000	23,700	0.37	22.40	1000	51.0 / 50.0	A/C
65/63	90	65	23,700	-0-	23,700	-0-	22.40	850	71.5 / 56.7	Dehum
75/62.5	50	75	39,000	25,500	13,500	0.65	12.70	1000	52.0 / 50.0	A/C
75/62.5	50	75	19,400	4,400	15,000	0.23	14.00	850	71.0 / 57.0	Dehum
75/65.5	60	75	40,500	23,400	17,100	0.57	16.10	1000	54.5 / 52.7	A/C
75/65.5	60	75	17,300	-0-	17,300	-0-	16.30	850	78.1 / 60.3	Dehum
75/68	70	75	42,100	20,000	22,100	0.47	20.80	1000	56.0 / 54.0	A/C
75/68	70	75	22,100	-0-	22,100	-0-	20.80	850	79.0 / 62.0	Dehum
80/67	50	95	40,000	27,500	12,500	0.69	11.80	1200	58.0 / 55.5	A/C
80/67	50	95	38,200	25,000	13,200	0.64	12.40	1000	57.0 / 54.7	A/C
80/67	50	95	13,700	-0-	13,700	-0-	12.90	850	83.5 / 64.0	Dehum

Rated CFM 1200. Shipped from the factory on optional CFM of 1000.

QH483D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Air Flow	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	46,900	19,700	25,700	0.42	24.00	1100	50.0 / 49.6	A/C
65/63	90	65	25,700	-0-	15,700	-0-	24.00	850	71.9 / 56.4	Dehum
75/62.5	50	75	45,300	32,000	13,300	0.70	12.50	1100	51.5 / 49.7	A/C
75/62.5	50	75	13,800	-0-	13,800	-0-	13.00	850	76.3 / 57.4	Dehum
75/65.5	60	75	47,000	27,300	18,500	0.58	17.40	1100	54.0 / 52.6	A/C
75/65.5	60	75	18,500	-0-	18,500	-0-	17.40	850	78.0 / 59.5	Dehum
75/68	70	75	48,800	23,000	25,800	0.47	24.30	1100	56.0 / 54.0	A/C
75/68	70	75	25,800	-0-	25,800	-0-	24.30	850	79.0 / 60.0	Dehum
80/67	50	95	46,000	32,000	14,000	0.70	13.21	1400	59.0 / 52.8	A/C
80/67	50	95	44,000	28,000	16,000	0.63	15.09	1100	55.0 / 52.8	A/C
80/67	50	95	15,700	-0-	15,700	-0-	14.80	850	86.4 / 63.8	Dehum

Rated CFM 1400. Shipped from the factory on optional CFM of 1100.

QH603D Application Performance Data

Indoor Conditions		Outdoor Conditions	System Capacity				Pounds of Water/Hour	Evaporator Air Flow	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	56,400	25,300	31,100	0.44	29.40	1550	51.0 / 50.5	A/C
65/63	90	65	28,900	2,400	26,500	0.08	25.00	1250	63.4 / 55.1	Dehum
75/62.5	50	75	55,000	39,000	16,000	0.70	15.09	1550	51.8 / 49.6	A/C
75/62.5	50	75	25,700	11,200	14,500	0.43	13.68	1250	66.9 / 55.9	Dehum
75/65.5	60	75	55,400	34,300	21,100	0.61	19.92	1550	54.6 / 52.9	A/C
75/65.5	60	75	27,750	7,800	19,950	0.28	18.84	1250	69.2 / 58.2	Dehum
75/68	70	75	60,050	30,550	29,500	0.51	27.80	1550	56.9 / 55.6	A/C
75/68	70	75	32,050	4,700	27,350	0.14	25.80	1250	71.5 / 60.6	Dehum
80/67	50	95	53,000	36,100	16,900	0.69	15.90	1550	58.6 / 56.1	A/C
80/67	50	95	50,350	34,350	16,000	0.68	15.09	1250	54.6 / 51.0	A/C
80/67	50	95	20,000	5,900	14,100	0.29	13.30	1250	75.6 / 61.8	Dehum

Rated CFM 1550. Shipped from the factory on optional CFM of 1250.