Bard Manufacturing Company, Inc.
Bryan, Ohio 43506

Models:
W24G2D, W30G2D, W36G2D
W42G2D, W48G2D, W60G2D

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 S3418 for the standard features of the base unit. Electrical data for the dehumidification models is identical to the electrical data for the standard W**G models.

SPECIAL FEATURES

DEHUMIDIFICATION CIRCUIT

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

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 drain back orifice 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. This will make the method of checking the ball freedom with a magnet difficult. Refer to Page 2 for the location of the check valve and drain back orifice. 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.

SEQUENCE OF DEHUMIDIFICATION OPERATION

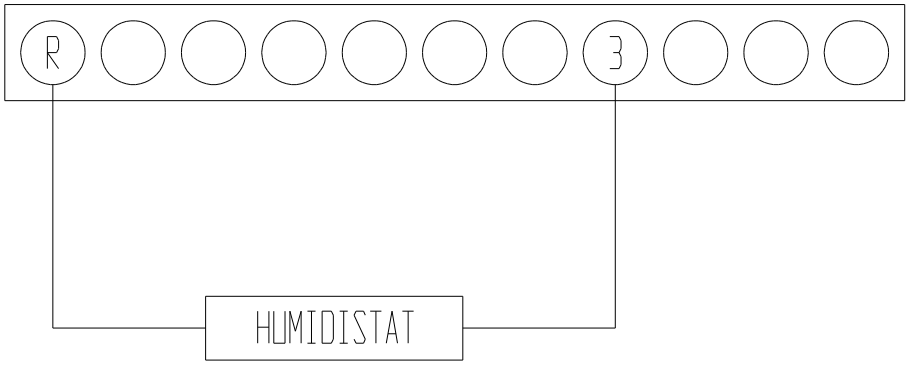
Dehumidification is controlled through a humidistat and is independent of temperature control. On a call for dehumidification mode of operation, the compressor and 3-way valve of the unit are energized through circuit R - 3 to provide dehumidification. Dehumidification will continue until the humidistat is satisfied.

Any time there is a call for cooling mode or operation through circuit R - Y the dehumidification mode will cancel and the system will return to cooling operation.

Any time there is a call for heating mode of operation through circuit R - W2, the dehumidification mode will cancel and the system will return to heating operation.

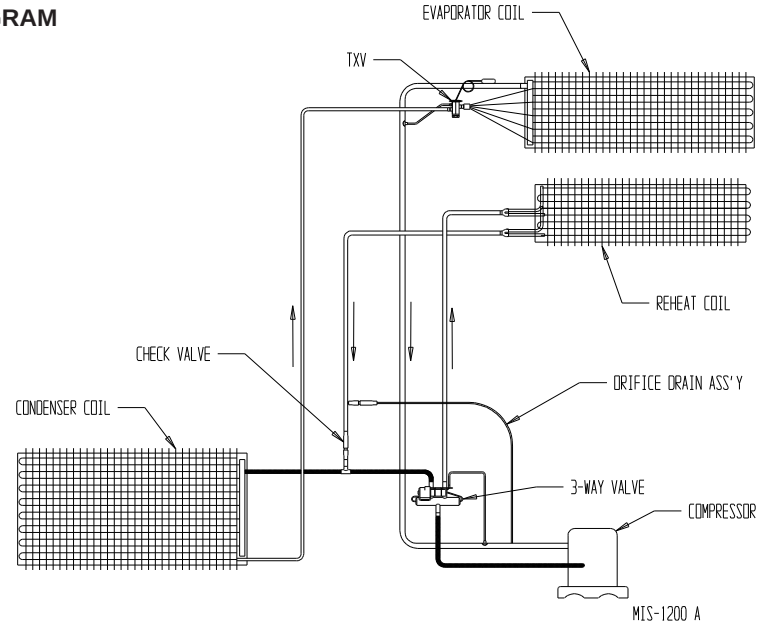
The indoor coil is equipped with a “freeze stat”. When the sensed indoor coil temperature falls below 27°, the compressor will be de-energized. Restart is dependent of the freeze stat reaching 50° to reset, and the time-out on the compressor control module.

UNIT 24V TERMINAL BLOCK

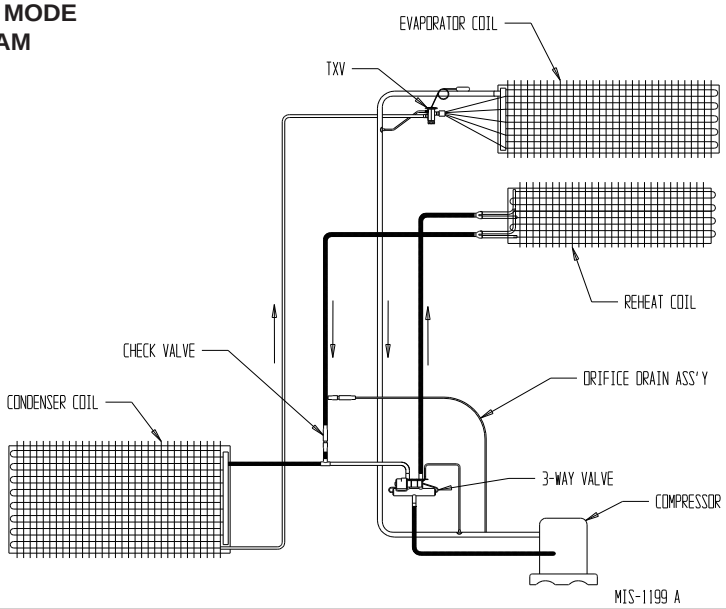


MIS-1642A

AIR CONDITIONING MODE CIRCUIT DIAGRAM



DEHUMIDIFICATION MODE CIRCUIT DIAGRAM



W24G2D 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	27,900	11,900	16,000	.43	15.1	800	51.6 / 51.1	A/C
65/63	90	65	-0-	(800)	13,050	-0-	12.3	800	66.0 / 58.2	Dehum
75/62.5	50	75	28,750	19,750	7,000	.69	6.6	800	52.5 / 50.8	A/C
75/62.5	50	75	9,650	3,700	5,950	.38	5.6	800	70.8 / 58.5	Dehum
75/65.5	60	75	28,550	17,550	11,000	.62	10.4	800	54.9 / 53.7	A/C
75/65.5	60	75	10,950	2,000	8,950	.18	8.5	800	72.9 / 61.3	Dehum
75/68	70	75	29,650	15,450	14,200	.52	13.4	800	57.4 / 56.5	A/C
75/68	70	75	11,850	350	11,500	.03	10.8	800	74.7 / 63.8	Dehum
80/67	50	95	26,000	18,900	7,100	.73	6.7	800	58.8 / 56.8	A/C
80/67	50	95	-0-	(2,500)	6,000	-0-	5.7	800	82.9 / 65.8	Dehum

W30G2D 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	35,650	15,550	20,100	.43	19.0	1000	51.1 / 50.8	A/C
65/63	90	65	-0-	(950)	16,200	-0-	15.3	1000	65.9 / 58.1	Dehum
75/62.5	50	75	33,050	25,300	7,750	.76	7.3	1000	52.1 / 50.9	A/C
75/62.5	50	75	10,300	4,200	6,100	.41	5.8	1000	71.1 / 59.2	Dehum
75/65.5	60	75	34,950	22,200	12,750	.64	12.0	1000	54.8 / 53.9	A/C
75/65.5	60	75	11,900	2,450	9,450	.21	8.9	1000	72.8 / 61.8	Dehum
75/68	70	75	36,400	19,550	16,850	.54	15.9	1000	57.2 / 56.5	A/C
75/68	70	75	13,300	700	12,600	.05	11.9	1000	74.3 / 64.1	Dehum
80/67	50	95	32,000	24,350	7,650	.76	7.2	1000	58.0 / 56.8	A/C
80/67	50	95	-0-	(2,200)	6,350	-0-	6.0	1000	82.1 /65.8	Dehum

W36G2D 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	42,950	18,400	24,550	.43	23.2	1100	49.9 / 49.5	A/C
65/63	90	65	18,250	(1,100)	19,350	-0-	18.3	1100	66.1 / 57.8	Dehum
75/62.5	50	75	38,600	28,700	9,900	.74	9.3	1100	51.1 / 50.1	A/C
75/62.5	50	75	12,450	4,750	7,700	.38	7.3	1100	71.1 / 58.8	Dehum
75/65.5	60	75	41,350	25,500	15,850	.62	15.0	1100	53.7 / 52.8	A/C
75/65.5	60	75	14,750	2,700	12,050	.18	11.4	1100	72.8 / 61.5	Dehum
75/68	70	75	44,000	22,600	21,400	.51	20.2	1100	56.2 / 55.4	A/C
75/68	70	75	17,850	1,000	16,850	.06	15.9	1100	74.3 / 63.3	Dehum
80/67	50	95	37,000	26,700	10,300	.72	9.7	1100	57.1 / 56.0	A/C
80/67	50	95	10,450	200	10,250	.02	9.6	1100	79.8 / 64.3	Dehum

W42G2D 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	45,300	19,600	25,700	.43	24.2	1300	51.1 / 50.9	A/C
65/63	90	65	20,800	(1,200)	22,000	-0-	20.8	1300	65.8 / 57.6	Dehum
75/62.5	50	75	42,700	33,100	9,600	.78	9.1	1300	51.8 / 51.0	A/C
75/62.5	50	75	15,050	7,650	7,400	.51	7.0	1300	69.6 / 58.8	Dehum
75/65.5	60	75	45,650	29,000	16,650	.64	15.7	1300	54.7 / 54.1	A/C
75/65.5	60	75	17,150	4,500	12,650	.26	11.9	1300	71.8 / 61.5	Dehum
75/68	70	75	47,900	25,300	22,600	.53	21.3	1300	57.2 / 56.7	A/C
75/68	70	75	19,500	1,600	17,900	.08	16.9	1300	73.8 / 63.7	Dehum
80/67	50	95	41,500	30,500	11,000	.73	10.4	1300	57.6 / 56.6	A/C
80/67	50	95	7,850	250	7,600	.03	7.2	1300	79.8 / 65.4	Dehum

W48G2D 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	52,150	22,300	29,850	.43	28.2	1550	51.8 / 51.5	A/C
65/63	90	65	24,800	(2,100)	26,900	-0-	25.4	1550	66.2 / 58.0	Dehum
75/62.5	50	75	50,100	38,200	11,900	.76	11.2	1550	52.5 / 51.4	A/C
75/62.5	50	75	19,900	9,800	10,100	.49	9.5	1550	69.2 / 58.3	Dehum
75/65.5	60	75	52,650	33,350	19,300	.63	18.2	1550	55.3 / 54.5	A/C
75/65.5	60	75	22,050	5,700	16,350	.26	15.4	1550	71.6 / 61.1	Dehum
75/68	70	75	54,950	29,250	25,700	.53	24.2	1550	57.7 / 57.1	A/C
75/68	70	75	23,850	2,100	21,750	.09	20.5	1550	73.8 / 63.6	Dehum
80/67	50	95	48,000	35,500	12,500	.74	11.8	1550	58.6 / 57.2	A/C
80/67	50	95	10,800	1,000	9,800	.09	9.2	1550	79.4 / 65.1	Dehum

W60G2D 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	63,700	27,400	36,300	.43	34.2	1650	49.8 / 49.6	A/C
65/63	90	65	30,550	(2,350)	32,900	-0-	31.0	1650	66.3 / 57.0	Dehum
75/62.5	50	75	60,700	43,900	16,800	.72	15.8	1650	50.7 / 49.5	A/C
75/62.5	50	75	22,700	13,850	8,850	.61	8.3	1650	67.3 / 55.2	Dehum
75/65.5	60	75	64,300	38,750	25,550	.60	24.1	1650	53.6 / 52.8	A/C
75/65.5	60	75	28,250	5,450	22,800	.19	21.5	1650	72.0 / 60.3	Dehum
75/68	70	75	66,400	34,250	32,150	.52	30.3	1650	56.0 / 55.4	A/C
75/68	70	75	30,500	1,800	28,700	.06	27.1	1650	74.0 / 62.4	Dehum
80/67	50	95	57,000	40,100	16,900	.70	5.9	1650	57.3 / 55.8	A/C
80/67	50	95	14,750	650	14,100	.04	13.3	1650	79.6 / 64.5	Dehum