BARD MANUFACTURING CO., INC.
BRYAN, OHIO 43506
www.bardhvac.com

MODELS:

WG242D, WG302D, WG362D, WG423D, WG482D, WG602D

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 S3344 for the standard features of the base unit. Electrical data for the dehumidification models is identical to the electrical data for the standard WG 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 the thermostat. On a call for dehumidification mode of operation, the compressor and 3-way valve of the unit are energized through circuit R - F to provide dehumidification. Dehumidification will continue until the humidistat is satisfied.

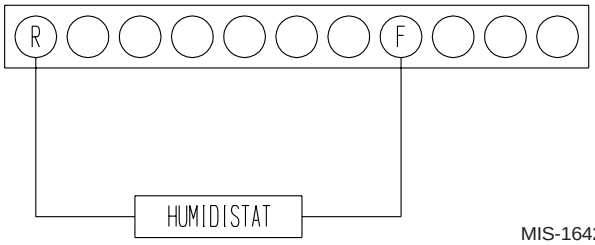
Any time there is a call for cooling mode or operation through circuit R - Y, the dehumidification mode will cancel and the system will return to cooling operation.

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. Dehumidification is delayed 45-60 seconds on start up after any heating cycle is complete.

Any time the indoor coil temperature falls below 32°, the compressor will be de-energized until the coil temperature rises above 57°.

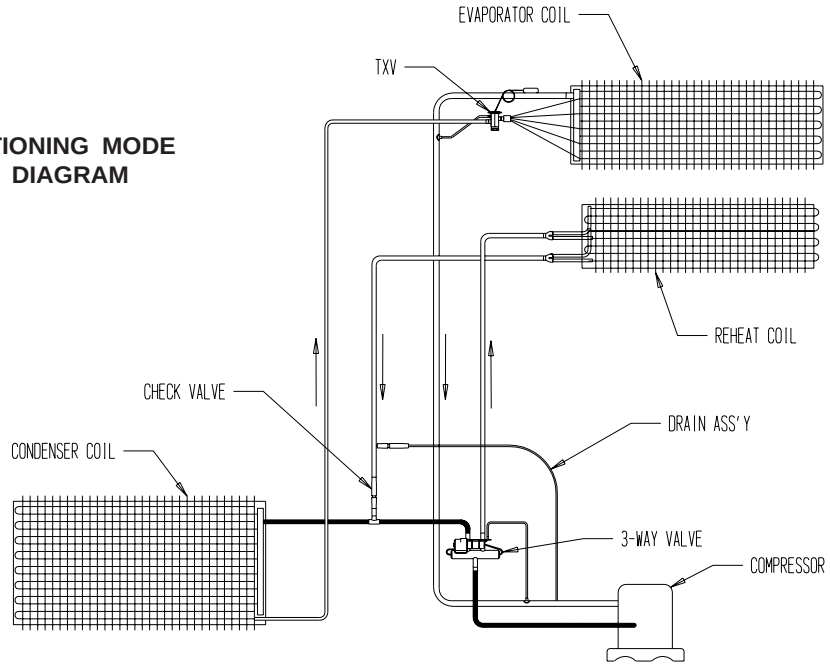
If the room temperature falls below 65°, the dehumidification mode will discontinue until the room temperature rises above 72°.

UNIT 24V TERMINAL BLOCK



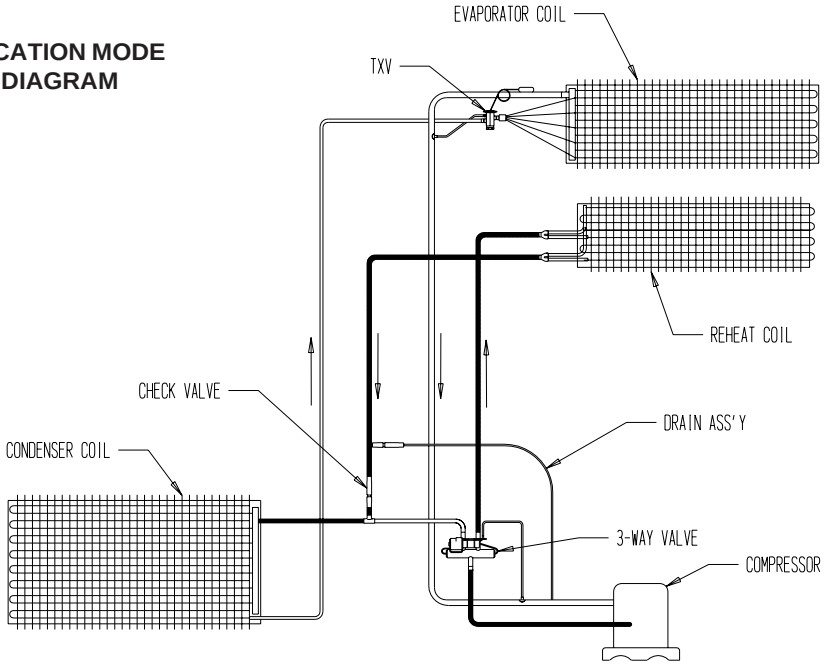
MIS-1642

AIR CONDITIONING MODE CIRCUIT DIAGRAM



MIS-1200

DEHUMIDIFICATION MODE CIRCUIT DIAGRAM



MIS-1199

WG242D 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	27,300	12,200	15,100	0.45	14.24	800	52.0 / 51.5	A/C
65/63	90	65		[2,400]	14,000	-0-	13.30	800	67.6 / 58.3	Dehum
75/62.5	50	75	25,800	19,800	6,000	0.77	5.64	800	53.0 / 51.3	A/C
75/62.5	50	75	8,100	2,800	5,300	0.34	4.96	800	72.4 / 59.3	Dehum
75/65.5	60	75	27,600	19,300	8,300	0.70	7.88	800	56.0 / 54.3	A/C
75/65.5	60	75	10,500	1,300	9,200	0.12	8.64	800	74.0 / 61.6	Dehum
75/68	70	75	28,600	17,100	11,500	0.60	10.84	800	58.0 / 57.0	A/C
75/68	70	75		[600]	11,200	-0-	10.52	800	75.7 / 63.7	Dehum
80/67	50	95	23,800	17,200	6,600	0.72	6.26	800	59.1 / 57.2	A/C
80/67	50	95		[2,200]	5,100	-0-	4.84	800	82.5 / 66.0	Dehum

WG302D 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	33,800	15,800	18,000	0.47	17.04	1000	52.0 / 51.0	A/C
65/63	90	65		[3,500]	18,400	-0-	17.32	1000	68.0 / 58.5	Dehum
75/62.5	50	75	31,800	24,200	7,600	0.76	7.16	1000	52.9 / 51.7	A/C
75/62.5	50	75	9,700	3,500	6,200	0.36	5.84	1000	71.9 / 59.5	Dehum
75/65.5	60	75	33,500	21,500	12,000	0.64	11.40	1000	55.0 / 54.5	A/C
75/65.5	60	75	11,900	2,400	9,500	0.20	8.96	1000	74.0 / 62.0	Dehum
75/68	70	75	35,600	19,100	16,500	0.54	15.60	1000	57.7 / 57.0	A/C
75/68	70	75		[1,100]	13,900	-0-	13.12	1000	76.0 / 64.0	Dehum
80/67	50	95	29,800	22,340	7,460	0.75	7.04	1000	58.5 / 57.4	A/C
80/67	50	95		[2,260]	6,610	-0-	6.24	1000	82.0 / 66.0	Dehum

WG362D 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	39,100	18,200	20,900	0.46	19.72	1100	51.0 / 50.5	A/C
65/63	90	65		[4,320]	20,800	-0-	19.64	1100	68.7 / 58.5	Dehum
75/62.5	50	75	36,400	27,630	8,770	0.76	8.28	1100	52.7 / 51.0	A/C
75/62.5	50	75	10,270	2,470	7,800	0.24	7.36	1100	73.0 / 59.5	Dehum
75/65.5	60	75	39,000	24,800	14,200	0.64	13.36	1100	55.0 / 54.0	A/C
75/65.5	60	75	11,900	-0-	11,900	-0-	11.24	1100	75.0 / 62.0	Dehum
75/68	70	75	40,780	21,220	19,560	0.52	18.45	1100	57.4 / 56.6	A/C
75/68	70	75		[2,310]	15,390	-0-	14.52	1100	76.8 / 64.0	Dehum
80/67	50	95	35,000	25,800	9,200	0.74	8.68	1100	59.0 / 57.0	A/C
80/67	50	95		[3,575]	9,000	-0-	8.46	1100	83.0 / 66.0	Dehum

Values shown in [ ] are BTUH of heating available at these conditions
Latent BTU = Lbs/Hr water * 1060
Sensible BTU = Total - Latent

WG423D 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	47,000	21,200	25,800	0.45	24.40	1300	50.8 / 50.2	A/C
65/63	90	65		[6,400]	24,400	-0-	23.00	1300	69.5 / 58.2	Dehum
75/62.5	50	75	43,700	33,100	10,600	0.76	10.06	1300	51.8 / 50.7	A/C
75/62.5	50	75	12,500	4,000	8,500	0.32	8.00	1300	72.3 / 59.1	Dehum
75/65.5	60	75	47,200	29,200	18,000	0.62	17.04	1300	54.6 / 53.6	A/C
75/65.5	60	75	16,600	600	16,000	0.36	15.10	1300	74.8 / 61.3	Dehum
75/68	70	75	49,700	27,000	22,700	0.54	21.40	1300	56.9 / 55.9	A/C
75/68	70	75		[2,850]	22,400	-0-	21.10	1300	77.0 / 63.5	Dehum
80/67	50	95	42,000	31,600	10,400	0.75	9.90	1300	58.0 / 57.0	A/C
80/67	50	95		[2,640]	10,500	-0-	9.96	1300	81.7 / 65.5	Dehum

WG482D 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	51,400	22,900	28,500	0.44	26.90	1550	52.5 / 51.7	A/C
65/63	90	65		[4,500]	26,800	-0-	25.30	1550	68.7 / 58.4	Dehum
75/62.5	50	75	46,200	36,200	10,000	0.78	9.48	1550	52.8 / 51.7	A/C
75/62.5	50	75	15,700	7,200	8,500	0.45	8.10	1550	71.3 / 59.2	Dehum
75/65.5	60	75	51,400	34,000	17,400	0.66	16.40	1550	55.7 / 54.7	A/C
75/65.5	60	75	19,000	3,300	15,700	0.17	14.90	1550	73.8 / 61.8	Dehum
75/68	70	75	54,500	30,600	23,900	0.56	22.50	1550	58.0 / 57.0	A/C
75/68	70	75		[2,100]	21,100	-0-	19.90	1550	76.1 / 64.0	Dehum
80/67	50	95	47,000	36,200	10,800	0.77	10.20	1550	59.2 / 57.6	A/C
80/67	50	95		[1,000]	8,050	-0-	7.60	1550	80.7 / 65.7	Dehum

WG602D 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	64,000	28,600	35,400	0.45	33.40	1650	50.0 / 49.4	A/C
65/63	90	65		[8,300]	35,000	-0-	33.10	1650	70.2 / 57.8	Dehum
75/62.5	50	75	61,400	44,800	16,600	0.73	15.70	1650	50.6 / 49.4	A/C
75/62.5	50	75	20,800	4,900	15,900	0.23	15.00	1650	72.6 / 58.5	Dehum
75/65.5	60	75	65,200	39,900	25,300	0.61	23.90	1650	53.5 / 52.4	A/C
75/65.5	60	75		[500]	24,400	-0-	23.00	1650	75.6 / 61.2	Dehum
75/68	70	75	68,500	36,100	32,400	0.53	30.60	1650	56.9 / 54.9	A/C
75/68	70	75		[4,000]	31,300	-0-	29.50	1650	77.7 / 63.3	Dehum
80/67	50	95	60,000	42,200	17,800	0.70	16.80	1650	56.6 / 55.2	A/C
80/67	50	95		[4,700]	16,000	-0-	15.10	1650	81.5 / 64.6	Dehum

Values shown in ( ) are BTUH of heating available at these conditions
Latent BTU = Lbs/Hr water * 1060
Sensible BTU = Total - Latent