Supplemental Instructions

Models:

I30H1D I36H1D I42H1D I48H1D I60H1D

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 S3451 for the standard features of the base unit I**H1D I-TEC®. Electrical data for the I-TEC dehumidification models is identical to the electrical data for the standard I-TEC 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. 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 4-way reheat 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°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 4-way reheat 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 outdoor coils for further heat transfer. 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 will operate at full load (capacity) and 4-way reheat valve that feeds the reheat coil is energized through D terminal. Dehumidification will continue until the humidistat is satisfied.

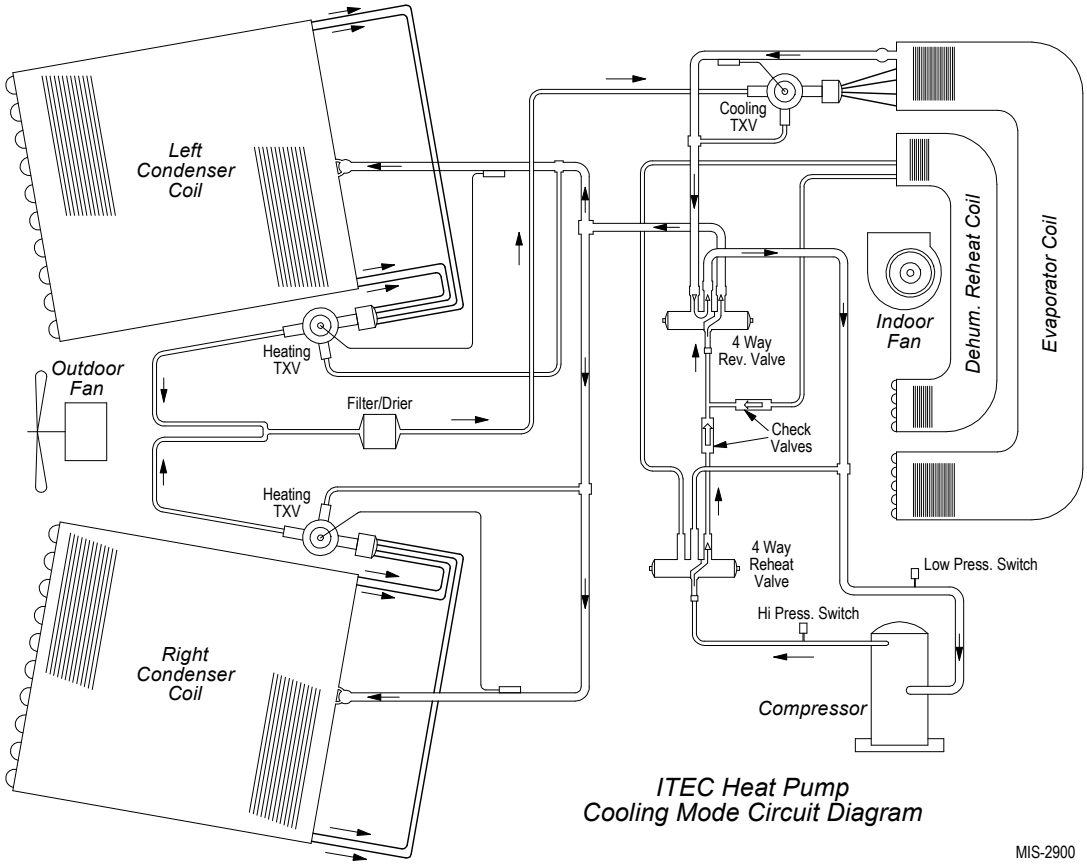
Anytime there is a R-Y call for cooling, dehumidification is canceled and the unit will operate in the cooling mode at part load for Stage 1 cooling (can shift to full load if 2nd Stage cooling required) until satisfied. If dehumidification call is still present when cooling call is satisfied, the unit will continue to operate and revert to dehumidification mode with compressor at full level.

Bard® SINCE 1914
Climate Control Solutions

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506

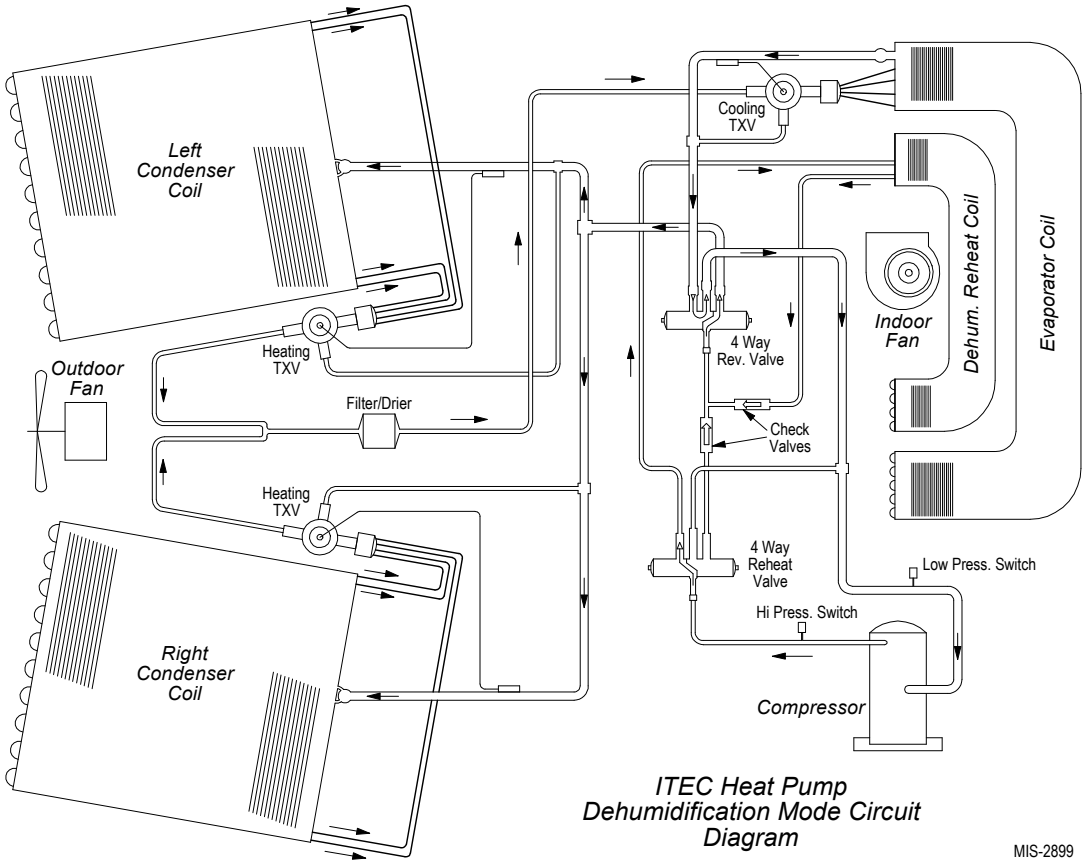
www.bardhvac.com

Manual: 7960-653E
Supersedes: 7960-653D
Date: 1-2-19



ITEC Heat Pump
Cooling Mode Circuit Diagram

MIS-2900



ITEC Heat Pump
Dehumidification Mode Circuit Diagram

MIS-2899

I30H1D APPLICATION PERFORMANCE DATA

Indoor Conditions °F		Outdoor Conditions °F	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	31,375	13,550	17,825	43.2%	16.8	850	50.7	50.3	A/C
65/63	90	65	15,025	(1,150)	16,175	N/A	15.3	850	66.3	57.3	Dehum
75/62.5	50	75	28,125	21,600	6,525	76.8%	6.2	850	52.0	51.0	A/C
75/62.5	50	75	8,900	3,650	5,250	N/A	5.0	850	71.1	58.9	Dehum
75/65.5	60	75	30,700	19,250	11,450	62.7%	10.8	850	54.5	53.5	A/C
75/65.5	60	75	11,400	1,775	9,625	N/A	9.1	850	73.1	61.4	Dehum
75/68	70	75	32,100	16,725	15,375	52.1%	14.5	850	57.1	56.2	A/C
75/68	70	75	13,150	(100)	13,250	N/A	12.5	850	75.1	63.6	Dehum
80/67	50	95	27,575	20,375	7,200	73.9%	6.8	850	58.1	56.7	A/C
80/67	50	95	2,625	(2,975)	5,600	N/A	5.3	850	83.3	66.0	Dehum

I36H1D APPLICATION PERFORMANCE DATA

Indoor Conditions °F		Outdoor Conditions °F	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	39,550	16,550	23,000	41.8%	21.7	1150	51.7	51.2	A/C
65/63	90	65	17,950	(925)	18,875	N/A	17.8	1150	65.7	57.9	Dehum
75/62.5	50	75	36,775	27,750	9,025	75.5	8.5	1150	52.8	51.3	A/C
75/62.5	50	75	11,000	5,025	5,975	45.7%	5.6	1150	70.9	59.3	Dehum
75/65.5	60	75	39,675	24,175	15,500	60.9%	14.6	1150	55.6	54.3	A/C
75/65.5	60	75	13,000	3,075	9,925	23.7%	9.4	1150	72.5	62.0	Dehum
75/68	70	75	41,625	21,300	20,325	51.2%	19.2	1150	57.9	56.8	A/C
75/68	70	75	15,900	1,050	14,850	6.6%	14.0	1150	74.1	64.0	Dehum
80/67	50	95	34,225	25,625	8,600	74.9%	8.1	1150	59.3	57.5	A/C
80/67	50	95	7,625	2,575	5,050	33.8%	4.8	1150	82.8	66.7	Dehum

I42H1D APPLICATION PERFORMANCE DATA

Indoor Conditions °F		Outdoor Conditions °F	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	47,475	18,875	28,600	39.8%	27.0	1300	52.0	51.5	A/C
65/63	90	65	20,175	(1,925)	22,100	N/A	20.8	1300	66.3	58.2	Dehum
75/62.5	50	75	42,775	31,675	11,100	74.1%	10.5	1300	52.7	51.0	A/C
75/62.5	50	75	11,950	5,075	6,875	42.5%	6.5	1300	71.3	59.5	Dehum
75/65.5	60	75	45,750	27,750	18,000	60.7%	17.0	1300	55.4	54.0	A/C
75/65.5	60	75	15,325	2,625	12,700	17.1%	12.0	1300	73.1	62.0	Dehum
75/68	70	75	48,075	24,300	23,775	50.5%	22.4	1300	57.8	56.7	A/C
75/68	70	75	17,675	250	17,425	1.4%	16.4	1300	74.8	64.2	Dehum
80/67	50	95	40,375	29,575	10,800	73.3%	10.2	1300	59.2	57.2	A/C
80/67	50	95	325	(3,900)	4,225	N/A	4.0	1300	82.8	66.8	Dehum

I48H1D APPLICATION PERFORMANCE DATA

Indoor Conditions °F		Outdoor Conditions °F	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	53,525	22,500	31,025	42.0%	29.3	1550	51.1	50.6	A/C
65/63	90	65	20,575	(4,925)	25,500	N/A	24.1	1550	68.0	58.6	Dehum
75/62.5	50	75	50,350	38,125	12,225	75.7%	11.5	1550	51.5	50.5	A/C
75/62.5	50	75	12,800	3,575	9,225	N/A	8.7	1550	72.7	59.7	Dehum
75/65.5	60	75	53,750	32,975	20,775	61.3%	19.6	1550	54.6	53.7	A/C
75/65.5	60	75	15,825	850	14,975	N/A	14.1	1550	74.4	62.3	Dehum
75/68	70	75	55,600	28,750	26,850	51.7%	25.3	1550	57.2	56.4	A/C
75/68	70	75	17,500	(1,875)	19,375	N/A	18.3	1550	76.1	64.7	Dehum
80/67	50	95	49,250	36,350	12,900	73.8%	12.2	1550	57.6	56.4	A/C
80/67	50	95	(850)	(7,300)	6,450	N/A	6.1	1550	84.6	67.2	Dehum

I60H1D APPLICATION PERFORMANCE DATA

Indoor Conditions °F		Outdoor Conditions °F	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	61,000	25,925	35,075	42.5%	33.1	1750	51.4	50.6	A/C
65/63	90	65	18,325	(6,475)	24,800	N/A	23.4	1750	68.6	59.6	Dehum
75/62.5	50	75	58,425	44,475	13,950	76.1%	13.2	1750	52.1	50.8	A/C
75/62.5	50	75	9,100	525	8,575	N/A	8.1	1750	74.8	60.8	Dehum
75/65.5	60	75	62,000	38,625	23,375	62.3%	22.1	1750	55.0	53.9	A/C
75/65.5	60	75	12,150	(1,700)	13,850	N/A	13.1	1750	76.0	63.4	Dehum
75/68	70	75	65,150	33,550	31,600	51.5%	29.8	1750	57.6	56.5	A/C
75/68	70	75	14,950	(4,575)	19,525	N/A	18.4	1750	77.4	65.5	Dehum
80/67	50	95	56,450	42,050	14,400	74.5%	13.6	1750	58.1	56.7	A/C
80/67	50	95	(3,750)	(10,550)	6,800	N/A	6.4	1750	85.6	67.5	Dehum

DEHUMIDIFICATION RELAY LOGIC BOARD

Energize on Unit Terminal Strip	Mode	Occupied/ Unoccupied	Inputs to the Board							Outputs from the Board						
			RAT	Y	B	W2	A1	D	G	G1	BK	RV	TWV	W	YO	A2
G	Blower	Unoccupied							X	X	X					
G, A	Blower	Occupied							X	X	X					
Y1, G	Part Load Cooling	Unoccupied		X					X	X	X				X	
Y1, G, A	Part Load Cooling	Occupied		X					X	X	X				X	
Y1, Y2, G	Full Load Cooling	Unoccupied		X					X	X	X				X	
Y1, Y2, G, A	Full Load Cooling	Occupied		X					X	X	X				X	
Y1, G, D	Part Load Cooling w/Dehum	Unoccupied		X				X	X	X	X				X	
Y1, G, D, A	Part Load Cooling w/Dehum	Occupied		X				X	X	X	X				X	
Y1, Y2, G, D	Full Load Cooling w/Dehum	Unoccupied		X				X	X	X	X				X	
Y1, Y2, G, D, A	Full Load Cooling w/Dehum	Occupied		X				X	X	X	X				X	
Y1, G, B	Part Load Heat Pump	Unoccupied		X	X				X	X	X	X			X	
Y1, G, B, A	Part Load Heat Pump	Occupied		X	X				X	X	X	X			X	
Y1, Y2, G, B	Full Load Heat Pump	Unoccupied		X	X				X	X	X	X			X	
Y1, Y2, G, B, A	Full Load Heat Pump	Occupied		X	X				X	X	X	X			X	
Y1, G, B, D	Part Load Heat Pump w/Dehum	Unoccupied		X	X			X	X	X	X	X			X	
Y1, G, B, D, A	Part Load Heat Pump w/Dehum	Occupied		X	X			X	X	X	X	X			X	
Y1, Y2, G, B, D	Full Load Heat Pump w/Dehum	Unoccupied		X	X			X	X	X	X	X			X	
Y1, Y2, G, B, D, A	Full Load Heat Pump w/Dehum	Occupied		X	X			X	X	X	X	X			X	
Y1, Y2, G, B, W2	Full Load Heat Pump w/Strip Heat	Unoccupied		X	X				X	X	X	X			X	
Y1, Y2, G, B, W2, A	Full Load Heat Pump w/Strip Heat	Occupied		X	X				X	X	X	X			X	
Y1, Y2, G, B, D	Full Load Heat Pump w/Strip Heat/Dehum	Unoccupied		X	X			X	X	X	X	X			X	
Y1, Y2, G, B, D, A	Full Load Heat Pump w/Strip Heat/Dehum	Occupied		X	X			X	X	X	X	X			X	
G, W2, W3	Emergency Heat	Unoccupied							X	X	X					
G, W2, W3, A	Emergency Heat	Occupied							X	X	X					
G, W2, W3, D	Emergency Heat w/Dehum*	Unoccupied						X	X	X			X		X	
G, W2, W3, D, A	Emergency Heat w/Dehum*	Occupied						X	X	X			X		X	
D	Dehumidification	Unoccupied						X		X			X		X	
D, A	Dehumidification	Occupied						X		X			X		X	

* Compressor operation is negated by the emergency heat relay