
Supplemental Instructions

Models:

T24H1D, T30H1D, T36H1D, T42H1D, T48H1D

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 S3436 for the standard features of the base unit. Electrical data for the dehumidification models is different than the electrical data for the standard T**H1 models. Refer to page 7 for the electrical data.

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 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. Refer to page 3 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.



Climate Control Solutions

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Dehumidification Sequence of Operation

Dehumidification is controlled through the thermostat (if capable) or through a separate humidistat. On a call for dehumidification mode of operation, the compressor and 3-way valve that feeds the reheat coil are energized through circuit R-W3. Dehumidification will continue until the humidistat is satisfied.

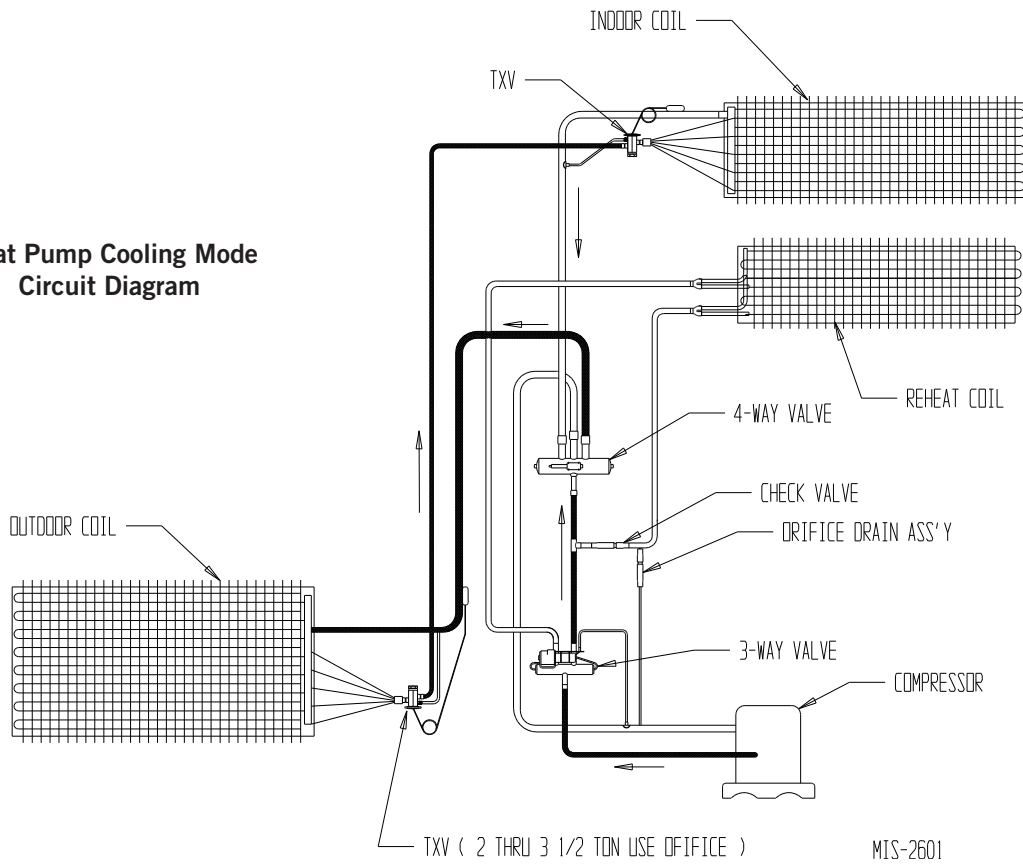
If the room temperature falls below 1st stage heating setpoint, electric heat will be energized by the room thermostat and cycle to maintain room temperature.

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

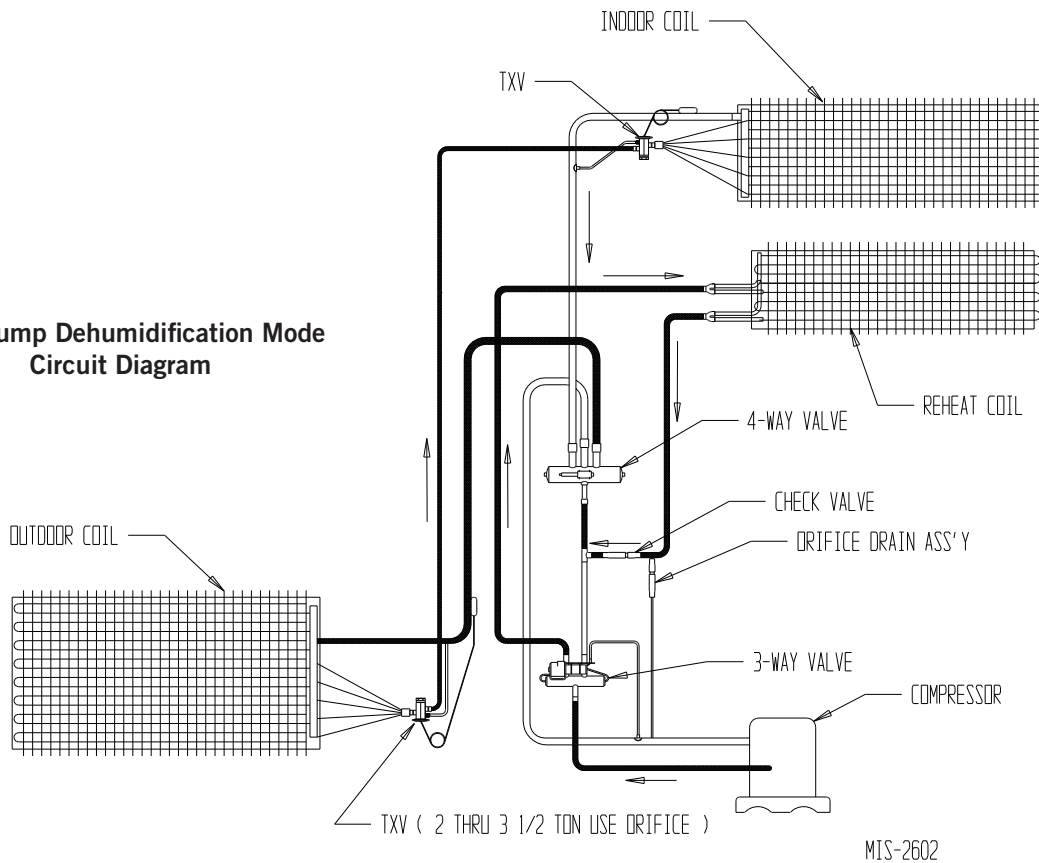
If the mixed air (return and ventilation, if used) temperature (measured at the internal filter location) drops below 65°F during dehumidification cycle, electric heat will cycle to help maintain room temperature to the 65°F condition.

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

**Heat Pump Cooling Mode
Circuit Diagram**



**Heat Pump Dehumidification Mode
Circuit Diagram**



T24H1D 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	27,230	11,436	15,794	0.42	14.90	800	52.5 / 52.0	A/C
65/63	90	65	8,842	(-1,495)	10,337	0.00	9.75	800	65.8 / 58.1	Dehum
75/62.5	50	75	25,378	19,858	5,520	0.78	5.21	800	53.3 / 51.8	A/C
75/62.5	50	75	6,386	2,409	3,977	0.38	3.75	800	72.3 / 60.0	Dehum
75/65.5	60	75	27,264	17,181	10,083	0.63	9.51	800	56.3 / 55.0	A/C
75/65.5	60	75	7,067	991	6,076	0.14	5.73	800	73.9 / 63.0	Dehum
75/68	70	75	28,309	14,950	13,359	0.53	12.60	800	58.7 / 57.8	A/C
75/68	70	75	8,073	(-247)	8,320	0.00	7.85	800	75.2 / 65.3	Dehum
80/67	50	95	(-897)	(-3,304)	2,407	0.00	2.27	800	83.6 / 67.2	Dehum

T30H1D 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	32,779	13,937	18,842	0.43	17.78	900	51.1 / 50.8	A/C
65/63	90	65	16,217	(-1,847)	18,064	0.00	17.04	900	66.8 / 57.5	Dehum
75/62.5	50	75	31,374	23,293	8,081	0.74	7.62	900	51.7 / 50.4	A/C
75/62.5	50	75	12,215	4,719	7,496	0.39	7.07	900	70.2 / 58.1	Dehum
75/65.5	60	75	29,392	19,065	10,327	0.65	9.74	900	65.4 / 56.1	A/C
75/65.5	60	75	14,080	2,309	11,771	0.16	11.10	900	72.7 / 61.0	Dehum
75/68	70	75	30,640	16,363	14,277	0.53	13.47	900	58.8 / 57.8	A/C
75/68	70	75	15,833	253	15,580	0.02	14.70	900	74.7 / 63.2	Dehum
80/67	50	95	6,355	(-1,066)	7,421	0.00	7.00	900	81.1 / 65.1	Dehum

T36H1D 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	40,066	17,003	23,063	0.42	21.76	1100	51.0 / 50.4	A/C
65/63	90	65	9,568	(-9,930)	19,498	0.00	18.39	1100	73.1 / 60.7	Dehum
75/62.5	50	75	36,553	28,237	8,316	0.77	7.85	1100	52.2 / 51.2	A/C
75/62.5	50	75	14,065	7,016	7,049	0.50	6.65	1100	69.2 / 58.4	Dehum
75/65.5	60	75	39,273	24,713	14,560	0.63	13.74	1100	58.3 / 54.0	A/C
75/65.5	60	75	17,153	4,370	12,783	0.25	12.06	1100	71.3 / 60.6	Dehum
75/68	70	75	41,587	21,828	19,759	0.52	18.64	1100	57.1 / 56.4	A/C
75/68	70	75	20,012	1,878	18,134	0.09	17.11	1100	73.4 / 62.6	Dehum
80/67	50	95	6,521	(-367)	6,888	0.00	6.50	1100	80.3 / 65.3	Dehum

Values shown in () are BTUH of heat available at these conditions

T42H1D 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	45,654	19,530	26,124	0.43	24.65	1100	51.3 / 50.8	A/C
65/63	90	65	25,011	(-538)	25,549	0.00	24.10	1100	65.4 / 56.7	Dehum
75/62.5	50	75	39,967	31,252	8,715	0.78	8.22	1100	52.9 / 51.6	A/C
75/62.5	50	75	16,304	8,113	8,191	0.50	7.73	1100	69.2 / 58.3	Dehum
75/65.5	60	75	43,127	27,465	15,662	0.64	14.78	1100	55.3 / 54.4	A/C
75/65.5	60	75	19,946	4,954	14,992	0.25	14.14	1100	71.5 / 66.7	Dehum
75/68	70	75	45,549	21,391	24,158	0.47	22.79	1100	57.6 / 56.8	A/C
75/68	70	75	23,317	2,454	20,863	0.11	19.68	1100	73.4 / 62.7	Dehum
80/67	50	95	7,758	(-67)	7,825	0.00	7.38	1100	80.0 / 65.2	Dehum

T48H1D 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	54,167	23,646	30,521	0.44	28.79	1550	51.4 / 51.1	A/C
65/63	90	65	29,286	784	28,502	0.03	26.89	1550	64.7 / 56.9	Dehum
75/62.5	50	75	49,595	39,408	10,187	0.79	9.61	1550	52.0 / 51.2	A/C
75/62.5	50	75	21,913	11,832	10,081	0.54	9.51	1550	68.2 / 57.9	Dehum
75/65.5	60	75	52,973	34,343	18,630	0.65	17.58	1550	54.9 / 54.3	A/C
75/65.5	60	75	25,907	7,703	18,204	0.30	17.17	1550	70.6 / 60.5	Dehum
75/68	70	75	56,025	29,806	26,219	0.53	24.73	1550	57.6 / 57.1	A/C
75/68	70	75	29,335	4,229	25,106	0.14	23.68	1550	72.5 / 62.6	Dehum
80/67	50	95	11,338	2,395	8,943	0.21	8.44	1550	78.6 / 64.8	Dehum

Values shown in () are BTUH of heat available at these conditions

TABLE 1
Dehumidification Relay Logic Board

		Inputs to Board								Outputs From Board								
		G	Y	B	W2	A1	D	RAT	L	G1	BK	YO	W	E	A2	TWV	L	RV
Cooling Mode	Unoccupied	X	X							X	X	X						
Cooling Mode	Occupied	X	X			X				X	X	X			X			
Cooling Mode	w/Dehum	X	X				X			X	X	X						
1st Stage Heating	Unoccupied	X	X	X						X	X	X						X
1st Stage Heating	Occupied	X	X	X		X				X	X	X			X			X
1st Stage Heating	w/Dehum	X	X	X			X			X	X	X	X			X		X
2nd Stage Heating	Unoccupied	X	X	X	X					X	X	X	X					X
2nd Stage Heating	Occupied	X	X	X	X	X				X	X	X	X		X			X
2nd Stage Heating	w/Dehum	X	X	X	X		X			X	X	X	X					X
Emergency Heat	Unoccupied				X					X	X		X	X				
Emergency Heat	Occupied				X	X				X	X		X	X	X			
Emergency Heat	w/Dehum				X		X			X		X		X		X		
Dehumidification	Unoccupied						X			X		X				X		
Dehumidification	Occupied						X	X		X	X	X	X			X		

TABLE 2
Electrical Specifications

Models	Rated Volts, HZ and Phase	No. of Field Power Circuits	Single Circuit				Multiple Circuit							
			① Minimum Circuit Ampacity	② Maximum External Fuse or Ckt. Brkr.	③ Field Power Wire Size	④ Ground Wire	① Minimum Circuit Ampacity		② Maximum External Fuse or Ckt. Breaker		③ Field Power Wire Size		④ Ground Wire Size	
							Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B
T24H1DA00, DA0Z DA04 ④ DAS8 ⑦ DAF8	230/208-60-1	1 1 1 1 or 2	24 45 48 65	35 50 50 70	8 8 8 6	10 10 10 8	24	42	35	45	8	8	10	10
T24H1DB00, DB0Z DB06 DB09	230/208-60-3	1 1 1	16 34 42	20 35 45	12 8 8	12 10 10								
T24H1DC0Z DC06 DC09	460-60-3	1 1 1	9 18 23	15 20 25	14 12 10	14 12 10								
T30H1DA00, DA0Z DA04 ④ DAS8 ⑦ DAF8	230/208-60-1	1 1 1 1 or 2	24 45 48 66	35 50 50 70	8 8 8 4	10 10 10 8	24	42	35	45	8	8	10	10
T30H1DB00, DB0Z DB06 DB09	230/208-60-3	1 1 1	18 36 45	25 40 45	10 8 8	10 10 10								
T30H1DC0Z DC06 DC09	460-60-3	1 1 1	10 19 24	15 20 25	14 12 10	14 12 10								
T36H1DA00, DA0Z DA05 DA08 DA10 ⑤ DA15	230/208-60-1	1 1 or 2 1 or 2 1 or 2	29 55 70 81 85	40 60 70 90 90	8 6 4 4 4	10 10 8 8 8	29 29 33	42 52 52	40 40 40	45 60 60	8 8 8	8 6 6	10 10 10	10 10 10
T36H1DB00, DB0Z DB06 DB09 ⑥ DB15	230/208-60-3	1 1 1 1	21 39 48 52	30 45 50 60	10 8 6 6	10 10 10 10								
T36H1DC0Z DC06 DC09 ⑥ DC15	460-60-3	1 1 1 1	12 21 26 27	15 25 30 30	14 10 10 10	14 10 10 10								
T42H1DA00, DA0Z DA05 DA08 DA10 ⑤ DA15	230/208-60-1	1 1 or 2 1 or 2 1 or 2	31 57 73 83 86	40 60 80 90 90	8 6 4 4 3	10 10 8 8 8	31 31 34	42 52 52	40 40 40	45 60 60	8 8 8	8 6 6	10 10 10	10 10 10
T42H1DB00, DB0Z DB06 DB09 ⑥ DB15	230/208-60-3	1 1 1 1	26 44 53 53	35 50 60 60	8 8 6 6	10 10 10 10								
T42H1DC0Z DC06 DC09 ⑥ DC15	460-60-3	1 1 1 1	13 22 26 27	15 25 30 30	12 10 10 10	12 10 10 10								
T48H1DA00, DA0Z DA05 DA08 DA10 ⑤ DA15	230/208-60-1	1 1 or 2 1 or 2 1 or 2 1 or 2	37 63 79 89 89	50 70 90 100 100	8 6 4 3 3	10 8 8 8 8	37 37 37 37	26 42 52 52	50 50 50 50	30 50 60 60	8 8 8 8	10 8 6 6	10 10 10 10	10 10 10 10
T48H1DB00, DB0Z DB06 DB09 ⑥ DB15	230/208-60-3	1 1 1 1	27 45 54 55	40 50 60 60	8 8 6 6	10 10 10 10								
T48H1DC0Z DC06 DC09 ⑥ DC15	460-60-3	1 1 1 1	15 24 28 29	20 25 30 30	12 10 10 10	12 10 10 10								

- ① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing. **CAUTION:** When more than one field power 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 (3) current carrying conductors are in a raceway.
- ② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.
- ③ Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.
- ④ Maximum KW that can operate with the heat pump on is 4KW. Full heat available during emergency heat mode.
- ⑤ Maximum KW that can operate with the heat pump on is 10KW. Full heat available during emergency heat mode.
- ⑥ Maximum KW that can operate with the heat pump on is 9KW. Full heat available during emergency heat mode.
- ⑦ Maximum KW that can operate with the heat pump on is 8KW. Full heat available during emergency heat mode.

NOTE: The Maximum Overcurrent Protection (MOCP) value listed is the maximum value as per UL 1995 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory-installed overcurrent protective device (circuit breaker) in this model may be lower than the maximum UL 1995 allowable MOCP value, but still above the UL 1995 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.