

MODELS TCH072 - 120 TCV072 - 300 S0HZ - HFC-410A

ENGLISH LANGUAGE/S-I UNITS



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A NIBE GROUP MEMBER

SUBMITTAL DATA - S-I UNITS

Unit Designation:_____

Architect:

Job Name: _____

Engineer:_____

Contractor:

PERFORMANCE DATA

Cooling Capacity: _			kW
EER:			
Heating Capacity:			kW
COP:			
Ambient Air Temp:			°C
Entering Water Tem	np (Clg):		°C
Entering Air Temp (Clg):		°C
Entering Water Tem	np (Htg):		°C
Entering Air Temp (Htg):		°C
Airflow <u>:</u>			<u> /s</u>
Fan Speed or Motor	/RPM/Turns:		
Operating Weight:			(kg)
ELECTRICAL D	ATA		
Power Supply:	Volts	Phase	Hz
Minimum Circuit An	npacity:		
Maximum Overcurr	ent Protection	:	

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Unit Features

THE TRANQUILITY (TC_L) COMPACT HIGH CAPACITY SERIES

The award winning Tranquility (TC_L) Compact High Capacity Series raises the bar for Water-Source Heat Pump efficiencies, features and application flexibility. Not only does the Tranquility® TC_L exceed ASHRAE 90.1 efficiencies, but it also uses EarthPure® HFC-410A zero ozone depletion refrigerant, making it an extremely environmentally-friendly option. Tranquility® TC_L is eligible for additional LEED (Leadership in Energy and Environmental Design) points because of the "green" technology design.

Available in sizes 21.1 kW through 87.9 kW with multiple cabinet configurations, the Tranquility® TC_L offers a wide range of units for most any installation. The Tranquility® TC_L has an extended range refrigerant circuit, capable of ground loop (geothermal) applications (may require optional extended range insulation), ground water (geothermal) applications, as well as water loop (boiler-tower) applications. Standard features are many. Microprocessor controls, galvanized steel cabinet, epoxy powder coat painted front access panel, galvanized steel with epoxy powder coat painted drain pan and TXV refrigerant metering device are just some of the features of the flexible Tranquility® TC_L.

ClimateMaster's exclusive double isolation compressor mounting system makes the Tranquility® TC_L one of the quietest units on the market. Compressors are mounted on specially engineered sound-tested EPDM grommets to a heavy gauge mounting plate, which is further isolated from the cabinet base with rubber grommets for maximized vibration and sound attenuation. The easy access control box and large access panels make installing and maintaining the unit easier than other water-source heat pumps currently in production.

Options such as coated air coil, DDC controls, and dual point power allow customized design solutions. Optional blower motor/sheave drive packages expand the operating range and help overcome some of the challenges associated with ductwork for retrofit installations. A cupro-nickel water-coil and sound absorbing UltraQuiet package are options that make a great unit even better.

The Tranquility[®] (TC_L) Compact High Capacity Series Water-Source Heat Pumps are designed to meet the challenges of today's HVAC demands with one of the most innovative products available on the market.

UNIT FEATURES

- Horizontal sizes 072 (21.1 kW), 096 (28.1 kW), 120 (35.2 kW)
- Vertical sizes 072 (21.1 kW), 096 (28.1 kW), 120 (35.2 kW), 160 (46.9 kW), 192 (56.3 kW), 240 (70.3 kW), 300 (87.9 kW)
- Horizontal unit configuration can be ordered with left or right return air and straight or back supply air discharge. Discharge is field convertible. Field conversion uses all existing parts including panels and belts
- Vertical unit configuration can be ordered with front or back return and top, front, or back discharge.
- Electrical box is on right side and can be field converted to left side of unit
- Electric power can enter from either side of front
- Water can be connected to either side
- Copeland scroll compressors
- Dual refrigeration circuits (All Models)
- Exceeds ASHRAE 90.1 efficiencies
- Communicating start-up and commissioning CXM2 microprocessor controls
- Galvanized steel construction with attractive matte black powder coat painted fron access panel.
- Insulated divider and separate compressor/air handler compartments
- TXV metering device
- Extended range -6.7 to 48.9°C operation (may require optional extended range insulation)

AVAILABLE OPTIONS

- Blower motor/sheave drive packages
- Intelligent communicating start-up and commissioning DXM2.5 controls
- BACnet, Modbus and Johnson N2 compatibility options for DDC controls
- Cupro-nickel water-coi
- Sound absorbing UltraQuiet package
- Coated air coil
- Dual point power

TCH/V Series Nomenclature



Performance Data - AHRI/ASHRAE/ISO 13256-1

	Wate	er Loop	Heat Pump)	Grou	nd Wate	r Heat Pum	р	Grou	nd Loop	Heat Pump	þ
Model	Cooling	30 °C	Heating 2	20 °C	Cooling	15 °C	Heating	10 °C	Cooling	25 °C	Heating	0 °C
lineuor	Capacity kW	EER W/W	Capacity kW	СОР	Capacity kW	EER W/W	Capacity kW	СОР	Capacity kW	EER W/W	Capacity kW	СОР
TCH/V072	16.47	3.8	22.57	5.0	19.08	5.9	18.32	4.3	17.42	4.4	14.10	3.6
TCH/V096	24.03	4.2	31.51	5.3	27.14	6.4	25.82	4.6	24.62	4.7	19.84	3.7
TCH/V120	29.72	4.2	39.83	4.8	33.94 6.2		32.80	4.2	31.36	4.8	25.67	3.5
TCV160	39.27	4.4	50.26	4.9	43.08	6.4	40.74	4.4	40.30	4.8	30.48	3.6
TCV192	47.04	4.5	59.64	5.1	51.88	6.4	48.21	4.6	47.33	4.9	36.34	3.7
TCV240	57.01	4.4	77.23	5.1	65.50	6.3	62.43	4.5	59.06	4.9	47.33	3.7
TCV300	74.74	4.3	97.01	5.1	84.12	6.0	78.25	4.4	77.52	4.7	59.79	3.6

ASHRAE/AHRI/ISO 13256-1. Metric (S-I) Units

All ratings based upon operation at lower voltage of dual voltage rated models, new unit with clean heat exchangers.

All TCH/V072 ratings @ 850 l/s airflow, w/1.05 l/s water flow.

All TCH/V096 ratings @ 1227 l/s airflow, w/1.26 l/s water flow.

All TCH/V120 ratings @ 1416 l/s airflow, w/1.58 l/s water flow.

All TCV160 ratings @ 1911 I/s airflow, w/2.21 I/s water flow.

All TCV192 ratings @ 2124 l/s airflow, w/2.59 l/s water flow.

All TCV240 ratings @ 2596 l/s airflow, w/3.09 l/s water flow.

All TCV300 ratings @ 3776 l/s airflow, w/3.97 l/s water flow.

Cooling capacities based upon 27°C DB, 19°C WB entering air temperature.

Heating capacities based upon 20°C DB, 15°C WB entering air temperature.

EN14511-2 Ratings

Cooling Ratings

	Water L Comfort	.oop, Rating	Control C Ratin	abinet Ig	Close Control Rating			
Model	27/19-3	0/35	35/24-1	5/20	24/17-30	0/35		
	Capacity kW	EER W/W	Capacity kW	EER W/W	Capacity kW	EER W/W		
TCH/V072	16.21	3.7	21.83	6.4	15.59	3.6		
TCH/V096	24.09	4.2	30.60	6.8	22.36	3.8		
TCH/V120	29.16	4.1	38.19	6.4	27.26	3.8		
TCV160	39.13	4.3	48.51	6.8	36.78	4.1		
TCV192	47.33	4.5	58.47	6.7	44.40	4.2		
TCV240	57.59	4.4	75.32	6.7	53.05	4.1		
TCV300	74.30	4.1	96.13	6.2	69.90	3.9		

Heating Ratings

	Water L Comfort F	oop, Rating	Water Ra	ating	Brine Ra	ating
Model	20-2	0	20-15/	12	20-0/-	3
	Capacity kW	СОР	Capacity kW	СОР	Capacity kW	СОР
TCH/V072	22.42	4.9	20.81	4.6	13.83	3.5
TCH/V096	31.80	5.2	29.66	4.7	19.93	3.7
TCH/V120	39.33	4.7	36.90	4.2	25.70	3.6
TCV160	51.08	4.9	46.89	4.5	30.04	3.5
TCV192	59.94	5.1	55.54	4.7	36.49	3.8
TCV240	48.51	5.1	72.69	4.6	47.48	3.7
TCV300	99.06	5.0	91.44	4.5	60.67	3.5

All ratings based upon operation at lower voltage of dual voltage rated models, new unit with clean heat exchangers.

All TCH/V072 ratings @ 850 l/s airflow, w/1.05 l/s water flow.

All TCH/V096 ratings @ 1227 I/s airflow, w/1.26 I/s water flow.

All TCH/V120 ratings @ 1416 l/s airflow, w/1.58 l/s water flow.

All TCV160 ratings @ 1911 I/s airflow, w/2.21 I/s water flow.

All TCV192 ratings @ 2124 I/s airflow, w/2.59 I/s water flow.

All TCV240 ratings @ 2596 l/s airflow, w/3.09 l/s water flow.

All TCV300 ratings @ 3776 l/s airflow, w/3.97 l/s water flow.

Cooling capacities based upon 27°C DB, 19°C WB entering air temperature. Heating capacities based upon 20°C DB, 15°C WB entering air temperature.

Performance Data - Selection Notes

For operation in the shaded area when water is used in lieu of an antifreeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level such that the LWT is maintained above 5°C when the JW3 jumper is not clipped (see example below). This is due to the potential of the refrigerant temperature being as low as 0°C with 5°C LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

Example:

At 10°C EWT (Entering Water Temperature) and 0.63 l/s (minimum flow rate), a TCH096 unit has a HE of 18.74 kW. To calculate LWT, rearrange the formula for HE as follows:

 $\label{eq:HE} \begin{array}{l} \mathsf{HE} = \mathsf{TD} \ x \ \mathsf{Flow} \ x \ 4.18 \\ \text{where} \ \mathsf{HE} = \mathsf{Heat} \ \mathsf{of} \ \mathsf{Extraction} \ (\mathsf{kW}); \ \mathsf{TD} = \mathsf{temperature} \ \mathsf{difference} \\ (\mathsf{EWT} \ - \ \mathsf{LWT}); \ \mathsf{and} \\ \mathsf{Flow} = \mathsf{Water} \ \mathsf{Flow} \ \mathsf{Rate} \ \mathsf{in} \ \mathsf{l/s} \end{array}$

 $TD = HE / (I/s \times 4.18)$ $TD = 18.74 / (0.63 \times 4.18)$ $TD = 7.1^{\circ}C$ LWT = EWT - TD $LWT = 10 - 7.1 = 2.9^{\circ}C$

In this example, LWT is below 5°C. Antifreeze will be required.

					_	
		HEATI	NG - EA	Г 20°С		
ER W/W	HC KW	PI KW	HE KW	LAT °C	СОР	\backslash
	18.05	5.54	12.51	33.3	3.3	
6.9	19.31	5.62	13.69	34.5	3.4	
7.2	20.20	5.68	14.52	35.3	3.6	
7.4	20.70	5.71	14.99	35.7	3.6	
6.4	22.14	5.80	16.34	37.0	3.8	
6.8	23.27	5.87	17.41	38.1	4.0	
0.5	23.91	5.90	18.00	38.7	4.0	
	24.69	5.95	18.74	39.4	4.1	,
	\$6.04	6.03	20.00	40.6		
		6.08	20.71			

850 I/s Nor WA1	Initial Airflow Heating & Cooling 'ER / BRINE COOLING - EAT 27/19°C HEATING - EAT 20°C FLOW PD TC SC S/T PI HR EER HC PI HE LAT COR COR														
EWT	FLOW	PD	TC	SC	S/T Patio	PI	HR	EER	SEER	HC	PI	HE	LAT	СОР	SCOP
	1.05	K/FA	KVV	Operativ	Ratio	KVV	KVV	VV/VV		11.09	4.10	7.00	21.7	2.0	2.5
-5	0.52	5.4	20.02	12.07				6.0	67	12.26	4.10	0.09	31.7	2.9	2.0
	0.55	15.0	20.05	12.07	0.05	2.91	22.94	7.2	7.1	10.20	4.10	9.00	22.9	2.2	2.0
U	0.79	15.2	20.10	13.07	0.05	2.75	22.00	7.5	7.1	13.70	4.21	9.57	33.4 00 7	3.3	2.9
	0.50	27.5	20.09	13.05	0.05	2.07	22.76	7.5	7.3	14.07	4.23	9.84	33.7	3.3	2.9
	0.53	4.6	19.55	12.90	0.66	3.24	22.79	6.1	6.0	15.61	4.32	11.29	35.2	3.6	3.1
5	0.79	13.4	19.85	13.01	0.66	3.05	22.90	6.5	6.3	16.32	4.36	11.95	35.9	3.7	3.2
	1.05	24.8	19.96	13.05	0.65	2.96	22.93	6.7	6.5	16.71	4.39	12.32	36.3	3.8	3.3
	0.53	4.1	19.14	12.74	0.67	3.44	22.58	5.6	5.5	17.06	4.41	12.65	36.6	3.9	3.4
10	0.79	12.7	19.55	12.90	0.66	3.25	22.80	6.0	5.9	17.87	4.46	13.42	37.4	4.0	3.5
	1.05	23.6	19.72	12.97	0.66	3.15	22.87	6.3	6.2	18.33	4.49	13.84	37.8	4.1	3.6
	0.53	3.0	18.46	12.46	0.67	3.73	22.19	5.0	4.9	18.93	4.52	14.41	38.4	4.2	3.7
15	0.79	10.0	18.96	12.67	0.67	3.52	22.48	5.4	5.3	19.86	4.58	15.28	39.3	4.3	3.8
	1.05	19.7	19.19	12.76	0.66	3.42	22.61	5.6	5.5	20.37	4.61	15.76	39.8	4.4	3.8
	0.53	2.3	17.75	12.15	0.68	4.02	21.77	4.4	4.3	20.64	4.63	16.01	40.1	4.5	3.9
20	0.79	9.0	18.31	12.39	0.68	3.79	22.10	4.8	4.7	21.66	4.70	16.96	41.1	4.6	4.0
	1.05	18.3	18.57	12.50	0.67	3.68	22.26	5.1	5.0	22.21	4.74	17.47	41.6	4.7	4.1
	0.53	1.6	16.66	11.67	0.70	4.46	21.12	3.7	3.7	22.97	4.79	18.18	42.3	4.8	4.2
25	0.79	8.2	17.27	11.94	0.69	4.21	21.48	4.1	4.0	24.06	4.87	19.19	43.4	4.9	4.3
	1.05	17.1	17.57	12.07	0.69	4.09	21.66	4.3	4.2	24.63	4.92	19.72	44.0	5.0	4.4
	0.53	1.2	15.65	11.21	0.72	4.90	20.55	3.2	3.2	24.89	4.94	19.95	44.2	5.0	4.4
30	0.79	7.7	16.27	11.49	0.71	4.63	20.89	3.5	3.5	25.97	5.03	20.93	45.3	5.2	4.5
	1.05	16.4	16.58	11.64	0.70	4.49	21.08	3.7	3.7	26.51	5.08	21.43	45.8	5.2	4.5
	0.53	0.9	14.30	10.60	0.74	5.55	19.85	2.6	2.6						
35	0.79	7.2	14.89	10.87	0.73	5.25	20.14	2.8	2.8						
	1.05	15.6	15.20	11.01	0.72	5.10	20.30	3.0	3.0						
	0.53	0.8	13.29	10.13	0.76	6.14	19.43	2.2	2.2						
40	0.79	6.7	13.84	10.38	0.75	5.81	19.64	2.4	2.4		Opera	tion Not F	Recomm	ended	
	1.05	15.0	14.13	10.52	0.74	5.64	19.77	2.5	2.5						
			Operat	tion <u>Not R</u>	lecomme	ended									
45	0.79	6.4	12.96	9.99	0.77	6.37	19.32	2.0	2.0						
	1.05	14.5	13.22	10.10	0.76	6.19	19.41	2.1	2.1						

Interpolation is permissible; extrapolation is not.

All entering air conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

AHRI/ISO certified conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

Table does not reflect fan or pump power corrections for AHRI/ISO conditions.

All performance data is based upon the lower voltage of dual voltage rated units.

Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.

Operation below 4°C EWT is based upon a 15% methanol antifreeze solution.

Operation below 16°C EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

Gray shaded area refers to calculations required to determine if heating water flow is sufficient for non-antifreeze systems.

Performance Data - TCH/V096

1227 I/s MA	TER / BF	RINE	ng & Coolin	C	OOLING	- EAT	27/19°C	;			Н	EATING	- EAT 20)°C	I
EWT °C	FLOW I/s	PD k/PA	TC kW	SC kW	S/T Ratio	PI kW	HR kW	EER W/W	SEER	HC kW	PI kW	HE kW	LAT °C	СОР	SCOP
-5	1.26	49.1		Operati	on Not F	lecomm	nended			17.10	5.51	11.59	31.5	3.1	2.7
	0.63	8.2	28.09	18.62	0.66	3.99	32.08	7.0	6.9	18.72	5.62	13.10	32.6	3.3	2.9
0	0.95	25.0	28.03	18.64	0.66	3.78	31.82	7.4	7.3	19.61	5.67	13.93	33.2	3.5	3.1
	1.26	44.6	27.89	18.63	0.67	3.69	31.58	7.6	7.5	20.10	5.71	14.39	33.5	3.5	3.1
	0.63	7.4	27.63	18.46	0.67	4.40	32.04	6.3	6.2	21.94	5.82	16.13	34.8	3.8	3.3
5	0.95	22.5	27.98	18.57	0.66	4.13	32.11	6.8	6.7	23.09	5.89	17.21	35.6	3.9	3.4
	1.26	40.3	28.07	18.61	0.66	4.01	32.08	7.0	6.9	23.73	5.92	17.81	36.0	4.0	3.5
	0.63	7.0	27.17	18.31	0.67	4.67	31.84	5.8	5.7	23.90	5.93	17.96	36.1	4.0	3.5
10	0.95	21.4	27.71	18.48	0.67	4.37	32.08	6.3	6.2	25.20	6.01	19.19	37.0	4.2	3.7
	1.26	38.7	27.91	18.55	0.66	4.23	32.14	6.6	6.5	25.92	6.05	19.87	37.5	4.3	3.8
	0.63	6.4	26.34	18.04	0.68	5.07	31.41	5.2	5.2	26.39	6.08	20.31	37.8	4.3	3.8
15	0.95	18.8	27.05	18.27	0.68	4.73	31.78	5.7	5.6	27.87	6.17	21.70	38.8	4.5	3.9
	1.26	34.2	27.36	18.37	0.67	4.57	31.92	6.0	5.9	28.69	6.22	22.46	39.3	4.6	4.0
	0.63	5.9	25.45	17.71	0.70	5.48	30.93	4.7	4.7	28.69	6.22	22.46	39.3	4.6	4.0
20	0.95	17.6	26.27	18.01	0.69	5.10	31.37	5.2	5.2	30.30	6.33	23.98	40.4	4.8	4.2
	1.26	32.4	26.65	18.14	0.68	4.92	31.57	5.4	5.3	31.19	6.38	24.80	41.0	4.9	4.3
	0.63	5.1	24.07	17.15	0.71	6.12	30.19	3.9	3.9	31.83	6.43	25.41	41.4	5.0	4.4
25	0.95	16.4	24.99	17.53	0.70	5.69	30.68	4.4	4.4	33.60	6.55	27.05	42.6	5.1	4.5
	1.26	30.7	25.43	17.71	0.70	5.49	30.92	4.7	4.7	34.54	6.62	27.92	43.3	5.2	4.5
	1.26	4.2	22.79	16.55	0.73	6.75	29.54	3.4	3.4	34.49	6.62	27.87	43.2	5.2	4.5
30	0.63	15.4	23.73	17.00	0.72	6.28	30.01	3.8	3.8	36.31	6.76	29.55	44.5	5.4	4.7
	0.95	29.5	24.20	17.21	0.71	6.06	30.26	4.0	4.0	37.26	6.85	30.41	45.1	5.4	4.7
	1.26	3.2	21.10	15.64	0.74	7.70	28.80	2.7	2.7						
35	0.63	14.3	22.00	16.15	0.73	7.17	29.17	3.1	3.1						
	0.95	28.0	22.47	16.39	0.73	6.91	29.38	3.3	3.3						
	1.26	2.5	19.86	14.87	0.75	8.55	28.42	2.3	2.3						
40	0.63	13.4	20.68	15.39	0.74	7.97	28.65	2.6	2.6		Opera	ation Not	Recomn	nended	
	0.95	26.9	21.12	15.66	0.74	7.69	28.81	2.8	2.8						
			Operati	on Not R	ecomme	nded									
45	0.95	12.6	19.61	14.69	0.75	8.76	28.37	2.2	2.2						
	1.26	25.9	20.00	14.95	0.75	8.46	28.46	2.4	2.4				,		,

Interpolation is permissible; extrapolation is not.

All entering air conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

AHRI/ISO certified conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

Table does not reflect fan or pump power corrections for AHRI/ISO conditions.

All performance data is based upon the lower voltage of dual voltage rated units.

Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.

Operation below 4°C EWT is based upon a 15% methanol antifreeze solution.

Operation below 16°C EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

Gray shaded area refers to calculations required to determine if heating water flow is sufficient for non-antifreeze systems.

Performance Data - TCH/V120

1416 l/s N	lominal Airf TER / BR	RINE COOLING - EAT 27/19°C HEATING - EAT 20°C PD TC SC S/T PI HR EER HC PI HE LAT COR COR <thcor< th=""> COR <thcor< th=""></thcor<></thcor<>													
EWT °C	FLOW I/s	PD k/PA	TC kW	SC kW	S/T Ratio	PI kW	HR kW	EER W/W	SEER	HC kW	PI kW	HE kW	LAT °C	СОР	SCOP
-5	1.58	81.2		Operat	ion Not I	Recomn	nended			22.43	7.40	15.02	33.1	3.0	2.6
	0.79	20.0	34.61	22.54	0.65	5.02	39.63	6.9	6.8	24.29	7.57	16.72	34.2	3.2	2.8
0	1.18	42.5	34.67	22.59	0.65	4.75	39.41	7.3	7.2	25.35	7.66	17.69	34.8	3.3	2.9
	1.58	73.0	34.55	22.55	0.65	4.63	39.18	7.5	7.4	25.93	7.71	18.23	35.1	3.4	3.0
	0.79	16.5	33.85	22.20	0.66	5.53	39.38	6.1	6.1	28.11	7.89	20.22	36.4	3.6	3.1
5	1.18	37.6	34.40	22.44	0.65	5.20	39.60	6.6	6.5	29.48	7.99	21.48	37.2	3.7	3.2
	1.58	65.4	34.57	22.52	0.65	5.05	39.61	6.9	6.8	30.23	8.05	22.18	37.6	3.8	3.3
	0.79	15.2	33.16	21.91	0.66	5.86	39.02	5.7	5.7	30.44	8.07	22.37	37.8	3.8	3.3
10	1.18	35.9	33.94	22.24	0.66	5.50	39.44	6.2	6.2	31.99	8.19	23.80	38.7	3.9	3.4
	1.58	62.7	34.25	22.38	0.65	5.33	39.58	6.4	6.3	32.84	8.26	24.59	39.2	4.0	3.5
	0.79	11.7	31.99	21.42	0.67	6.33	38.32	5.1	5.1	33.43	8.30	25.13	39.5	4.0	3.5
15	1.18	29.5	32.97	21.83	0.66	5.93	38.90	5.6	5.6	35.18	8.43	26.75	40.5	4.2	3.7
	1.58	53.2	33.41	22.01	0.66	5.74	39.15	5.8	5.8	36.14	8.51	27.64	41.1	4.2	3.7
	0.79	10.6	30.76	20.90	0.68	6.80	37.56	4.5	4.5	36.19	8.51	27.68	41.1	4.3	3.8
20	1.18	27.2	31.87	21.37	0.67	6.37	38.24	5.0	5.0	38.10	8.65	29.45	42.2	4.4	3.8
	1.58	49.9	32.39	21.59	0.67	6.17	38.56	5.3	5.3	39.14	8.73	30.41	42.8	4.5	3.9
	0.79	9.9	28.88	20.11	0.70	7.53	36.40	3.8	3.8	39.98	8.79	31.19	43.3	4.5	3.9
25	1.18	25.5	30.09	20.62	0.69	7.06	37.15	4.3	4.3	42.06	8.94	33.11	44.5	4.7	4.1
	1.58	47.5	30.69	20.87	0.68	6.83	37.51	4.5	4.5	43.17	9.03	34.14	45.2	4.8	4.2
	0.79	9.2	27.14	19.37	0.71	8.24	35.38	3.3	3.3	43.17	9.03	34.15	45.2	4.8	4.2
30	1.18	24.5	28.37	19.90	0.70	7.73	36.10	3.7	3.7	45.32	9.19	36.13	46.5	4.9	4.3
	1.58	46.0	28.99	20.16	0.70	7.48	36.47	3.9	3.9	46.43	9.27	37.16	47.1	5.0	4.4
	0.79	8.4	24.83	18.39	0.74	9.30	34.13	2.7	2.7						
35	1.18	23.6	26.00	18.89	0.73	8.74	34.74	3.0	3.0						
	1.58	44.7	26.61	19.15	0.72	8.46	35.08	3.2	3.2						
	0.79	7.7	23.12	17.68	0.76	10.25	33.37	2.3	2.3						
40	1.18	22.8	24.19	18.12	0.75	9.63	33.83	2.5	2.5		Opera	tion Not	Recom	mended	
	1.58	43.7	24.76	18.36	0.74	9.34	34.10	2.7	2.7						
			Operati	ion Not F	Recomm	ended									
45	1.18	22.1	22.70	17.51	0.77	10.52	33.22	2.2	2.2						
	1.58	42.7	23.21	17.72	0.76	10.20	33.41	2.3	2.3						

Interpolation is permissible; extrapolation is not.

All entering air conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

AHRI/ISO certified conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

Table does not reflect fan or pump power corrections for AHRI/ISO conditions.

All performance data is based upon the lower voltage of dual voltage rated units.

Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.

Operation below 4°C EWT is based upon a 15% methanol antifreeze solution.

Operation below 16°C EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

Gray shaded area refers to calculations required to determine if heating water flow is sufficient for non-antifreeze systems.

Performance Data - TCV160

1911 I/s N	ominal Airf	IOW Heatin	ng & Cooli	ng		G - FAT	27/19%	c			нг	ATING	- FAT 2	0°C	
EN/T			те	80	C/T			EED			рі				
°C	l/s	k/PA	kW	kW	Ratio	kW	kW	W/W	SEER	kW	kW	kW	°C	COP	SCOP
-5	2.21	53.1		Operat	ion Not I	Recomn	nended			26.75	8.73	18.02	31.6	3.1	2.7
	1.10	16.2	41.45	28.80	0.69	5.98	47.43	6.9	6.9	29.63	8.92	20.70	32.8	3.3	2.9
0	1.66	30.5	39.05	27.66	0.71	5.46	44.51	7.2	7.1	30.96	9.02	21.93	33.4	3.4	3.0
	2.21	47.8	37.59	26.93	0.72	5.22	42.81	7.2	7.1	31.70	9.08	22.62	33.7	3.5	3.1
	1.10	12.8	43.49	29.69	0.68	6.88	50.38	6.3	6.3	35.09	9.34	25.75	35.2	3.8	3.3
5	1.66	24.7	42.67	29.34	0.69	6.38	49.05	6.7	6.7	36.88	9.49	27.39	35.9	3.9	3.4
	2.21	39.4	41.97	29.04	0.69	6.14	48.11	6.8	6.8	37.88	9.57	28.31	36.4	4.0	3.5
	1.10	10.2	43.75	29.78	0.68	7.39	51.13	5.9	5.9	38.44	9.61	28.83	36.6	4.0	3.5
10	1.66	20.5	43.68	29.77	0.68	6.89	50.57	6.3	6.3	40.51	9.79	30.72	37.5	4.1	3.6
	2.21	33.6	43.40	29.66	0.68	6.65	50.05	6.5	6.5	41.65	9.89	31.76	38.0	4.2	3.7
	1.10	9.8	42.98	29.45	0.69	8.01	50.99	5.4	5.4	42.77	9.99	32.78	38.5	4.3	3.8
15	1.66	19.8	43.58	29.71	0.68	7.51	51.09	5.8	5.8	45.14	10.21	34.93	39.5	4.4	3.8
	2.21	32.5	43.69	29.76	0.68	7.26	50.95	6.0	6.0	46.44	10.33	36.11	40.1	4.5	3.9
	1.10	9.4	41.76	28.93	0.69	8.60	50.36	4.9	4.9	46.76	10.36	36.40	40.2	4.5	3.9
20	1.66	19.1	42.80	29.37	0.69	8.09	50.89	5.3	5.3	49.37	10.61	38.76	41.3	4.6	4.0
	2.21	31.5	43.19	29.54	0.68	7.84	51.03	5.5	5.5	50.78	10.75	40.03	42.0	4.7	4.1
	1.10	9.0	39.54	27.98	0.71	9.47	49.01	4.2	4.2	52.24	10.90	41.34	42.6	4.8	4.2
25	1.66	18.5	40.96	28.59	0.70	8.93	49.89	4.6	4.6	55.07	11.20	43.87	43.8	4.9	4.3
	2.21	30.4	41.61	28.86	0.69	8.67	50.27	4.8	4.8	56.57	11.36	45.21	44.5	5.0	4.4
	1.10	8.7	37.27	27.00	0.72	10.31	47.58	3.6	3.6	56.82	11.39	45.43	44.6	5.0	4.4
30	1.66	17.9	38.82	27.67	0.71	9.73	48.55	4.0	4.0	59.70	11.72	47.98	45.8	5.1	4.5
	2.21	29.6	39.58	28.00	0.71	9.45	49.04	4.2	4.2	61.18	11.90	49.28	46.5	5.1	4.5
	1.10	8.2	34.18	25.66	0.75	11.56	45.74	3.0	3.0						
35	1.66	17.0	35.68	26.31	0.74	10.92	46.60	3.3	3.3						
	2.21	28.4	36.47	26.65	0.73	10.61	47.08	3.4	3.4						
	1.10	7.9	31.98	24.74	0.77	12.72	44.71	2.5	2.5						
40	1.66	16.5	33.28	25.27	0.76	12.00	45.28	2.8	2.8		Operat	tion Not	Recom	mended	
	2.21	27.8	33.99	25.58	0.75	11.65	45.65	2.9	2.9						
			Operati	ion Not F	Recomm	ended									
45	1.66	16.1	31.43	24.53	0.78	13.11	44.55	2.4	2.4						
	2.21	27.2	32.01	24.76	0.77	12.72	44.74	2.5	2.5						

Interpolation is permissible; extrapolation is not.

All entering air conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

AHRI/ISO certified conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

Table does not reflect fan or pump power corrections for AHRI/ISO conditions.

All performance data is based upon the lower voltage of dual voltage rated units.

Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.

Operation below 4°C EWT is based upon a 15% methanol antifreeze solution.

Operation below 16°C EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

Gray shaded area refers to calculations required to determine if heating water flow is sufficient for non-antifreeze systems.

Performance Data - TCV192

2124 l/s N	ominal Airf	low Heati	ng & Cooli	ng		0 5 4 7	0.000	-							
WA	FER / BR	INE		(G - EAT	27/19°	C			H	EATING	- EAT 2	2°°C	
°C	FLOW I/s	PD k/PA	TC kW	SC kW	S/T Ratio	PI kW	HR kW	EER W/W	SEER	HC kW	PI kW	HE kW	LAT ℃	СОР	SCOP
-5	2.59	74.0		Operat	ion Not I	Recomn	nended			31.74	9.78	21.96	32.4	3.2	2.8
	1.29	22.4	46.44	32.99	0.71	6.68	53.12	7.0	7.0	35.35	10.04	25.31	33.8	3.5	3.1
0	1.94	41.6	41.61	30.25	0.73	5.77	47.38	7.2	7.2	37.07	10.17	26.90	34.4	3.6	3.1
	2.59	65.0	38.96	28.66	0.74	5.33	44.29	7.3	7.2	38.03	10.24	27.78	34.8	3.7	3.2
	1.29	19.3	51.33	35.46	0.69	8.12	59.45	6.3	6.3	41.97	10.55	31.42	36.3	4.0	3.5
5	1.94	34.3	49.29	34.48	0.70	7.38	56.67	6.7	6.7	44.18	10.73	33.45	37.2	4.1	3.6
	2.59	53.9	47.83	33.72	0.71	7.00	54.82	6.9	6.9	45.40	10.83	34.56	37.7	4.2	3.7
	1.29	17.5	52.37	35.90	0.69	8.81	61.18	5.9	5.9	45.94	10.88	35.06	37.9	4.2	3.7
10	1.94	29.0	51.66	35.63	0.69	8.15	59.80	6.3	6.3	48.42	11.09	37.33	38.8	4.4	3.8
	2.59	46.3	50.88	35.27	0.69	7.80	58.68	6.5	6.5	49.79	11.20	38.59	39.4	4.4	3.8
	1.29	15.4	51.83	35.59	0.69	9.55	61.37	5.4	5.4	50.94	11.31	39.63	39.8	4.5	3.9
15	1.94	28.0	52.24	35.83	0.69	8.94	61.18	5.9	5.9	53.75	11.56	42.20	40.9	4.6	4.0
	2.59	44.8	52.12	35.80	0.69	8.63	60.74	6.1	6.1	55.30	11.70	43.60	41.5	4.7	4.1
	1.29	14.6	50.53	34.98	0.69	10.19	60.73	5.0	5.0	55.54	11.72	43.82	41.6	4.7	4.1
20	1.94	27.1	51.66	35.51	0.69	9.62	61.28	5.4	5.4	58.63	12.01	46.62	42.8	4.9	4.3
	2.59	43.4	52.00	35.69	0.69	9.32	61.32	5.6	5.6	60.32	12.17	48.15	43.5	5.0	4.4
	1.29	14.1	47.92	33.84	0.71	11.10	59.02	4.3	4.3	61.89	12.32	49.57	44.1	5.0	4.4
25	1.94	26.3	49.65	34.58	0.70	10.53	60.18	4.7	4.7	65.32	12.66	52.66	45.4	5.2	4.5
	2.59	42.1	50.42	34.92	0.69	10.24	60.66	4.9	4.9	67.17	12.84	54.32	46.1	5.2	4.5
	1.29	13.6	45.18	32.74	0.72	11.96	57.15	3.8	3.8	67.34	12.86	54.48	46.2	5.2	4.5
30	1.94	25.6	47.11	33.50	0.71	11.36	58.47	4.2	4.2	70.98	13.24	57.74	47.6	5.4	4.7
	2.59	41.0	48.05	33.90	0.71	11.06	59.12	4.4	4.4	72.92	13.45	59.48	48.4	5.4	4.7
	1.29	13.0	41.50	31.44	0.76	13.27	54.77	3.1	3.1						
35	1.94	24.5	43.32	32.04	0.74	12.58	55.90	3.5	3.5						
	2.59	39.4	44.29	32.39	0.73	12.25	56.54	3.6	3.6						
	1.29	12.7	39.06	30.90	0.79	14.54	53.59	2.7	2.7						_
40	1.94	23.9	40.51	31.17	0.77	13.72	54.23	3.0	3.0		Opera	tion Not	Recom	mended	_
	2.59	38.3	41.35	31.40	0.76	13.34	54.69	3.1	3.1						
			Operati	on Not F	Recomm	ended									
45	1.94	23.4	38.54	30.91	0.80	14.96	53.49	2.6	2.6						
	2.59	37.8	39.15	30.93	0.79	14.51	53.66	2.7	2.7						

Interpolation is permissible; extrapolation is not.

All entering air conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

AHRI/ISO certified conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

Table does not reflect fan or pump power corrections for AHRI/ISO conditions.

All performance data is based upon the lower voltage of dual voltage rated units.

Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.

Operation below 4°C EWT is based upon a 15% methanol antifreeze solution.

Operation below 16°C EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

Gray shaded area refers to calculations required to determine if heating water flow is sufficient for non-antifreeze systems.

Performance Data - TCV240

2596 I/s Nominal Airflow Heating & Cooling WATER / BRINE COOLING - EAT 27/19°C HEATING - EAT 20°C EWT FLOW PD TC SC S/T PI HR EER SEER HC PI HE LAT COP S															
EWT °C	FLOW I/s	PD k/PA	TC kW	SC kW	S/T Ratio	PI kW	HR kW	EER W/W	SEER	HC kW	PI kW	HE kW	LAT ℃	СОР	SCOP
-5	3.09	53.96		Operat	ion Not I	Recomm	nended			41.17	12.77	28.39	33.11	3.22	2.8
	1.55	18.08	68.23	44.53	0.65	9.55	77.77	7.15	7.2	45.39	13.06	32.33	34.45	3.47	3.0
0	2.32	32.65	67.67	44.30	0.65	9.14	76.81	7.41	7.4	47.69	13.22	34.47	35.19	3.60	3.1
	3.09	51.20	67.00	44.03	0.66	8.96	75.97	7.48	7.5	48.98	13.31	35.67	35.60	3.68	3.2
	1.55	15.48	67.26	44.25	0.66	10.34	77.59	6.52	6.5	53.71	13.65	40.06	37.10	3.93	3.4
5	2.32	26.95	68.06	44.50	0.65	9.82	77.88	6.94	7.0	56.71	13.87	42.84	38.05	4.09	3.6
	3.09	43.04	68.17	44.52	0.65	9.58	77.76	7.12	7.1	58.38	13.99	44.39	38.59	4.17	3.6
	1.55	13.95	66.05	43.85	0.66	10.86	76.90	6.08	6.1	58.73	14.02	44.72	38.70	4.19	3.7
10	2.32	23.60	67.47	44.32	0.66	10.28	77.75	6.56	6.6	62.14	14.27	47.87	39.78	4.35	3.8
	3.09	38.25	67.96	44.48	0.65	10.01	77.98	6.79	6.8	64.04	14.41	49.62	40.39	4.44	3.9
	1.55	12.97	63.75	43.04	0.68	11.61	75.36	5.50	5.5	65.14	14.50	50.64	40.74	4.49	3.9
15	2.32	22.95	65.68	43.72	0.67	10.97	76.65	6.00	6.0	69.01	14.80	54.21	41.97	4.66	4.1
	3.09	37.25	66.50	44.00	0.66	10.67	77.17	6.24	6.3	71.16	14.97	56.19	42.65	4.75	4.2
	1.55	12.06	61.28	42.12	0.69	12.37	73.64	4.97	5.0	71.03	14.96	56.07	42.61	4.75	4.2
20	2.32	22.36	63.51	42.95	0.68	11.68	75.19	5.45	5.5	75.28	15.29	59.99	43.97	4.92	4.3
	3.09	36.34	64.55	43.32	0.67	11.35	75.89	5.70	5.7	77.62	15.48	62.13	44.71	5.01	4.4
	1.55	11.70	57.48	40.64	0.71	13.54	71.03	4.26	4.3	79.14	15.61	63.53	45.20	5.07	4.4
25	2.32	21.78	59.92	41.60	0.69	12.78	72.70	4.70	4.7	83.81	15.99	67.81	46.68	5.24	4.6
	3.09	35.40	61.13	42.07	0.69	12.41	73.54	4.94	5.0	86.32	16.20	70.12	47.48	5.32	4.7
	1.55	11.46	54.02	39.20	0.73	14.70	68.72	3.69	3.7	86.02	16.18	69.84	47.39	5.31	4.6
30	2.32	21.29	56.45	40.21	0.71	13.88	70.32	4.08	4.1	90.89	16.60	74.29	48.94	5.47	4.8
	3.09	34.60	57.69	40.72	0.71	13.48	71.17	4.30	4.3	93.46	16.82	76.63	49.75	5.55	4.9
	1.55	10.84	49.61	37.28	0.75	16.41	66.02	3.03	3.1						
35	2.32	20.56	51.79	38.24	0.74	15.51	67.30	3.35	3.4						
	3.09	33.44	52.96	38.75	0.73	15.07	68.03	3.52	3.5						
	1.55	10.60	46.63	35.98	0.77	17.94	64.57	2.61	2.6						
40	2.32	20.15	48.44	36.77	0.76	16.96	65.40	2.86	2.9		Opera	tion Not	Recom	mended	
	3.09	32.77	49.46	37.21	0.75	16.48	65.94	3.01	3.0						
			Operati	on Not F	Recomm	ended									
45	2.32	19.81	45.95	35.69	0.78	18.40	64.35	2.51	2.5						
	3.09	32.26	46.76	36.03	0.77	17.89	64.64	2.62	2.6						

Interpolation is permissible; extrapolation is not.

All entering air conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

AHRI/ISO certified conditions are 27°C DB and 19°C WB in cooling and 20°C DB in heating.

Table does not reflect fan or pump power corrections for AHRI/ISO conditions.

All performance data is based upon the lower voltage of dual voltage rated units.

Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.

Operation below 4°C EWT is based upon a 15% methanol antifreeze solution.

Operation below 16°C EWT requires optional insulated water/refrigerant circuit.

See performance correction tables for operating conditions other than those listed above.

Gray shaded area refers to calculations required to determine if heating water flow is sufficient for non-antifreeze systems.

Performance Data - TCV300

3776 l/s N	ominal Airf	low Heati	ng & Cooli	ng		G - EAT	27/19°	C			HE	ATING	- EAT 2	0°C	
FWT	FLOW	PD	тс	SC	S/T	PI	HR	FFR		нс	PI	HE			
°C	l/s	k/PA	kW	kW	Ratio	kW	kW	w/w	SEER	kW	kW	kW	°C	COP	SCOP
-5	3.97	78.6		Operat	ion Not I	Recomn	nended			52.87	16.85	36.02	31.6	3.1	2.7
	1.99	26.1	80.72	56.51	0.70	12.61	93.33	6.4	6.4	57.85	17.16	40.69	32.7	3.4	3.0
0	2.98	47.3	75.57	53.39	0.71	11.83	87.40	6.4	6.4	60.51	17.33	43.18	33.2	3.5	3.1
	3.97	73.3	72.33	51.37	0.71	11.48	83.81	6.3	6.3	61.99	17.43	44.56	33.6	3.6	3.1
	1.99	21.8	84.39	58.65	0.70	13.95	98.34	6.1	6.1	67.75	17.81	49.94	34.8	3.8	3.3
5	2.98	38.2	82.76	57.71	0.70	13.13	95.89	6.3	6.3	71.23	18.05	53.18	35.6	3.9	3.4
	3.97	59.8	81.27	56.83	0.70	12.74	94.01	6.4	6.4	73.17	18.18	54.98	36.0	4.0	3.5
	1.99	19.3	84.67	58.82	0.69	14.75	99.42	5.7	5.7	73.79	18.22	55.57	36.2	4.0	3.5
10	2.98	31.6	84.70	58.83	0.69	13.90	98.59	6.1	6.1	77.75	18.50	59.25	37.0	4.2	3.7
	3.97	50.4	84.12	58.50	0.70	13.49	97.61	6.2	6.2	79.95	18.66	61.29	37.5	4.3	3.8
	1.99	16.7	82.91	57.90	0.70	15.78	98.69	5.3	5.3	81.53	18.78	62.76	37.8	4.3	3.8
15	2.98	30.5	84.35	58.65	0.70	14.89	99.24	5.7	5.7	86.04	19.11	66.93	38.8	4.5	3.9
	3.97	48.7	84.64	58.80	0.69	14.46	99.10	5.9	5.9	88.52	19.30	69.22	39.4	4.6	4.0
	1.99	15.8	80.33	56.57	0.70	16.78	97.12	4.8	4.8	88.67	19.31	69.36	39.4	4.6	4.0
20	2.98	29.6	82.68	57.78	0.70	15.86	98.53	5.2	5.2	93.59	19.69	73.91	40.5	4.8	4.2
	3.97	47.2	83.56	58.24	0.70	15.40	98.96	5.4	5.4	96.28	19.90	76.38	41.1	4.8	4.2
	1.99	15.3	75.74	54.25	0.72	18.27	94.01	4.2	4.2	98.46	20.08	78.39	41.6	4.9	4.3
25	2.98	28.6	78.84	55.81	0.71	17.29	96.13	4.6	4.6	103.82	20.52	83.30	42.7	5.1	4.5
	3.97	45.8	80.27	56.54	0.70	16.80	97.08	4.8	4.8	106.68	20.77	85.91	43.4	5.1	4.5
	1.99	14.8	71.14	52.01	0.73	19.71	90.85	3.6	3.6	106.71	20.77	85.94	43.4	5.1	4.5
30	2.98	27.6	74.48	53.63	0.72	18.66	93.14	4.0	4.0	112.22	21.26	90.96	44.6	5.3	4.6
	3.97	44.4	76.14	54.45	0.72	18.15	94.29	4.2	4.2	115.07	21.53	93.54	45.2	5.3	4.6
	1.99	14.3	64.96	49.17	0.76	21.83	86.79	3.0	3.0						
35	2.98	26.6	68.13	50.59	0.74	20.69	88.82	3.3	3.3						
	3.97	43.0	69.82	51.38	0.74	20.12	89.95	3.5	3.5						
	1.99	13.9	60.63	47.49	0.78	23.75	84.39	2.6	2.6						
40	2.98	26.0	63.33	48.50	0.77	22.50	85.82	2.8	2.8		Operat	tion Not	Recom	mended	
	3.97	42.2	64.83	49.13	0.76	21.89	86.72	3.0	3.0						
			Operati	on Not F	Recomm	ended									
45	2.98	25.5	59.67	47.22	0.79	24.33	83.99	2.5	2.5						
	3.97	41.5	60.87	47.60	0.78	23.66	84.54	2.6	2.6						

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See performance correction tables for operating conditions other than those listed above.

Gray shaded area refers to calculations required to determine if heating water flow is sufficient for non-antifreeze systems.

TCH/V Performance Data - Correction Tables

Air Flow Correction Table

Percent		Cool	ing			Heating	
of Rated Airflow	Total Capacity	Sensible Capacity	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
75%	0.962	0.869	0.947	0.959	0.959	1.039	0.962
81%	0.975	0.902	0.960	0.972	0.970	1.024	0.973
88%	0.988	0.934	0.972	0.984	0.981	1.009	0.985
94%	0.994	0.967	0.986	0.992	0.990	1.004	0.992
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106%	1.007	1.028	1.014	1.009	1.010	1.000	1.005
113%	1.014	1.056	1.028	1.017	1.020	1.001	1.010
119%	1.019	1.083	1.046	1.024	1.036	1.008	1.013
125%	1.023	1.109	1.063	1.031	1.051	1.015	1.016

Entering Air Correction Table Cooling

Entering	Total		Sens	ible Cooli	ing Capac	ity Multip	olier - Ente	ering Air I	DB °C		Dever	Heat of
Air WB °C	Capacity	15.6	18.3	21.1	23.9	26.7	27.0	29.4	32.2	35.0	Power	Rejection
10.0	0.734	0.882	*	*	*	*	*	*	*	*	0.978	0.783
12.8	0.806	0.676	0.884	1.112	*	*	*	*	*	*	0.984	0.842
15.6	0.883		0.673	0.882	1.092	*	*	*	*	*	0.990	0.930
18.3	0.977			0.668	0.876	1.088	1.114	1.295	*	*	0.997	0.998
19.0	0.985			0.618	0.824	1.036	1.061	1.245	*	*	0.999	0.988
19.4	1.000			0.584	0.790	1.000	1.026	1.212	*	*	1.000	1.000
21.1	1.043				0.661	0.869	0.894	1.081	1.292	*	1.004	1.042
23.9	1.139					0.652	0.652	0.859	1.069	1.284	1.012	1.113

* Sensible capacity equals total capacity.

AHRI/ISO/ASHRAE 13256-1 uses entering air conditions of Cooling; 27.0°C DB/ 19.0°C WB, and Heating 20.0°C DB/ 15.0°C WB entering air temperature.

Entering Air Correction Table

Entering Air DB °C	Heating Capacity	Power	Heat of Extraction
10	1.040	0.839	1.101
12.8	1.030	0.883	1.075
15.6	1.018	0.920	1.053
18.3	1.008	0.960	1.026
20.0	1.001	0.984	1.011
21.1	1.000	1.000	1.000
23.9	0.978	1.038	0.979
26.7	0.968	1.091	0.943

Antifreeze Correction Table

			Cooling		Heat	ting	WPD
Antifreeze Type	Antifreeze %		EWT 32°C		EWT	-1°C	Corr. Fct.
	/0	Total Cap	Sens Cap	Power	Htg Cap	Power	EWT -1°C
Water	0	1.000	1.000	1.000			
	5	0.995	0.995	1.003	0.989	0.997	1.070
Propylene Glycol	15	0.986	0.986	1.009	0.968	0.990	1.210
	25	0.978	0.978	1.014	0.947	0.983	1.360
	5	0.995	0.995	1.002	0.989	0.997	1.070
Methanol	15	0.990	0.990	1.007	0.968	0.990	1.160
	25	0.982	0.982	1.012	0.949	0.984	1.220
	5	0.998	0.998	1.002	0.981	0.994	1.140
Ethanol	15	0.994	0.994	1.005	0.944	0.983	1.300
	25	0.986	0.986	1.009	0.917	0.974	1.360
	5	0.998	0.998	1.002	0.993	0.998	1.040
Ethylene Glycol	15	0.994	0.994	1.004	0.980	0.994	1.120
	25	0.988	0.988	1.008	0.966	0.990	1.200

Blower Performance Data - TCH/V072 - Standard Unit

Airflow in I/s with wet coil and clean filter

l/s	Ра	0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
	BkW			0.09	0.12	0.14	0.17	0.19	0.21	0.24	0.25	0.27	0.29	0.31	0.32	0.34	0.35
	Sheave/Mtr			В	A	A	A	A	A	с	С	с	с	с	с	С	С
614	RPM			505	563	615	655	695	730	765	790	815	840	870	890	910	925
	Turns Open	Ì		3	5	3.5	3	2	1	5	4.5	4	3.5	2.5	2.5	2	1.5
	BkW			0.12	0.14	0.17	0.19	0.22	0.24	0.26	0.29	0.30	0.33	0.34	0.36	0.38	0.40
	Sheave/Mtr			В	A	A	A	A	С	С	С	С	С	С	С	С	С
661	RPM			526	578	635	675	715	755	785	815	840	870	890	910	930	950
	Turns Open			2	4.5	3	2.5	1.5	5	4.5	4	3.5	3	2	2	1.5	1
	BkW		0.12	0.14	0.17	0.19	0.22	0.25	0.27	0.29	0.32	0.34	0.36	0.38	0.41	0.43	
700	Sheave/Mtr		В	В	A	A	A	A	С	С	С	С	С	С	С	С	
708	RPM		500	547	604	650	695	735	775	805	835	865	890	915	940	960	
	Turns Open		3	1.5	4	3	2	1	4.5	4	3.5	3	2.5	2	1.5	1	
	BkW		0.14	0.17	0.19	0.22	0.25	0.27	0.29	0.32	0.34	0.37	0.39	0.41	0.44		
755	Sheave/Mtr		В	В	А	A	A	A	С	С	С	С	С	С	С		
/55	RPM		510	568	620	665	710	750	785	820	855	885	910	935	960		
	Turns Open		2.5	1	3.5	2.5	1.5	1	4.5	3.5	3	2.5	2	1.5	1		
	BkW		0.16	0.19	0.22	0.24	0.27	0.29	0.32	0.34	0.36	0.39	0.42	0.44			
802	Sheave/Mtr	ļ	В	A	A	А	A	С	С	С	С	С	С	С			
002	RPM		531	583	635	680	720	765	800	835	870	900	925	950			
	Turns Open		2	4.5	3.5	2.5	1.5	5	4	3.5	2.5	2	1.5	1			
	BkW	0.15	0.18	0.21	0.24	0.26	0.29	0.31	0.34	0.36	0.39	0.42	0.45				
850	Sheave/Mtr	В	В	A	A	A	A	С	С	С	С	С	С				
	RPM	500	547	599	645	690	735	775	815	850	885	910	940				
	Turns Open	3	1.5	4	3	2	1	5	4	3	2.5	2	1.5				
	BkW	0.18	0.21	0.23	0.27	0.30	0.33	0.36	0.40	0.43	0.46	0.49	0.52				
897	Sheave/Mtr	В	В	A	A	A	A	С	С	С	С	С	С				
	RPM	510	557	604	655	695	740	780	820	855	890	920	950				
	Turns Open	2.5	1.5	4	3	2	1	4.5	3.5	3	2	1.5	1				
	BkW	0.21	0.23	0.26	0.29	0.33	0.37	0.41	0.44	0.48	0.50	0.54	0.56				
944	Sheave/Mtr	В	В	A	A	A	С	С	С	С	С	С	С				
	RPM	521	568	615	660	705	750	785	825	865	895	930	960				
	Turns Open	2.5	1	3.5	2.5	1.5	5.5	4.5	3.5	2.5	2	1.5	1				
	BkW	0.25	0.28	0.32	0.34	0.37	0.40	0.44	0.48	0.52	0.55	0.58					
991	Sheave/Mtr	В	A	A	A	A	С	С	С	С	С	С					
	RPM	536	583	630	670	715	755	795	835	875	905	940					
	Turns Open	2	4.5	3.5	2.5	1.5	5	4	3.5	2.5	2	1					
	BKVV Sheeve/Mtr	0.28	0.30	0.34	0.37	0.41	0.45	0.48	0.52	0.56	0.59	0.62					
1038	DDM	A 557	500	645	695	720	770	010	950	005	015	050					
		5	1	3	2	1	5	4	3	2.5	15	950					
		0.32	4	0.38	0.42	0.45	0.48	4	0.56	2.5	0.63	0.67					
	Sheave/Mtr	Δ	Δ	Δ	Δ	Δ	0.40 C	0.52	0.00	0.00	0.00	0.07 C					
1086	RPM	573	620	660	705	745	785	820	860	895	925	960					
	Turns Open	4.5	3.5	3	1.5	1	4.5	3.5	3	2	1.5	1					
	BkW	0.36	0.39	0.43	0.46	0.49	0.54	0.58	0.62	0.65	0.69		l				
	Sheave/Mtr	A	A	A	A	c	C	C	C	C	C						
1133	RPM	609	645	690	730	765	805	845	880	910	945						
	Turns Open	4	3	2.5	1.5	5	4	3	2.5	2	1						
	BkW	0.39	0.42	0.46	0.49	0.54	0.58	0.62	0.66	0.70	0.73						
	Sheave/Mtr	A.00	A	A	A	C C	C	C	C.00	C	C						
1180	RPM	620	660	700	740	780	815	850	885	920	950						
	Turns Open	3.5	3	2	1	4.5	4	3	2.5	1.5	1						

A = Standard Static/Standard Motor, B = Low Static/Standard Motor, C = High Static/Standard Motor.

Unit factory shipped with standard static sheave and drive at 2.5 turns open. Other speed require field selection. For applications requiring higher static pressures, contact your local representative. Performance data does not include drive losses and is based on sea level conditions. Do not operate in black regions. All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 380V for 380-420V units.

Blower Performance Data - TCH/V096 - Standard Unit

Airflow in I/s with wet coil and clean filter

l/s	Pa	0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
	BkW		0.15	0.18	0.21	0.24	0.27	0.30	0.32	0.34	0.36	0.39	0.42	0.46	0.49	0.52	0.55
	Sheave/Mtr	-	B	B	B	Δ	Δ	Δ	Δ	Δ	Δ	C	C	C	C	C	C
850	RPM	-	500	552	604	655	700	745	780	820	855	800	015	0/5	970	005	1020
	T	-	500	002	4.5	5.5	100	145	700	020	000	030	0.5	345	0.5		1020
	Turns Open	-	4.5	3	1.5	5.5	4.5	3.5	2.5	2		4	3.5	3	2.5	2	1.5
	BKVV	-	0.19	0.21	0.24	0.28	0.31	0.34	0.38	0.41	0.44	0.47	0.50	0.53	0.55	0.58	0.61
897	Sheave/Mtr	-	В	В	A	A	A	A	A	A	A	C	C	C	C	C	C
			521	5/3	625	670	/10	755	795	830	870	900	930	960	990	1015	1040
	Turns Open		4	2.5	6	5	4	3	2.5	1.5	1	3.5	3	2.5	2	1.5	1
	BkW	0.20	0.22	0.25	0.28	0.32	0.36	0.39	0.42	0.46	0.49	0.52	0.55	0.58	0.60	0.63	
944	Sheave/Mtr	В	В	В	A	A	A	A	A	A	С	C	С	С	C	С	
344	RPM	500	542	594	640	685	730	770	805	845	880	915	945	975	1005	1030	
	Turns Open	4.5	3.5	2	5.5	4.5	3.5	3	2	1	4	3.5	2.5	2	1.5	1	
	BkW	0.24	0.27	0.30	0.33	0.36	0.39	0.43	0.47	0.51	0.54	0.57	0.60	0.63	0.66	0.69	
001	Sheave/Mtr	В	В	В	A	A	A	A	A	A	С	С	С	С	С	С	
551	RPM	516	563	615	655	700	740	780	820	860	895	925	960	990	1020	1045	
	Turns Open	4	3	1.5	5.5	4.5	3.5	2.5	2	1	4	3	2.5	2	1	1	
	BkW	0.26	0.29	0.32	0.36	0.40	0.43	0.47	0.51	0.54	0.58	0.61	0.64	0.67	0.71		
4020	Sheave/Mtr	В	В	A	A	A	A	A	A	С	С	С	С	С	С		
1038	RPM	536	583	630	670	715	755	795	835	870	905	935	970	1000	1030		
	Turns Open	3.5	2.5	6	5	4	3	2.5	1.5	4	3.5	3	2	1.5	1		
	BkW	0.30	0.34	0.37	0.40	0.43	0.47	0.51	0.55	0.59	0.62	0.66	0.69	0.73	0.77		
4000	Sheave/Mtr	В	В	A	Α	Α	Α	A	A	С	С	С	С	С	С		
1086	RPM	557	604	650	690	730	770	810	845	885	915	950	980	1010	1040		
	Turns Open	3	2	5.5	4.5	3.5	3	2	1	4	3.5	2.5	2	1.5	1		
	BkW	0.34	0.37	0.41	0.44	0.47	0.51	0.56	0.60	0.64	0.67	0.71	0.74	0.78			
	Sheave/Mtr	B	A	A	A	A	A	A	A	C	C	C	C	С			
1133	RPM	583	625	665	705	745	785	825	860	895	925	960	990	1020			
	Turns Open	2.5	6	5	4	3.5	2.5	1.5	1	4	3	2.5	2	1			
	BkW	0.38	0.41	0.44	0.48	0.52	0.56	0.61	0.65	0.69	0.72	0.75	0.79	0.83			
	Sheave/Mtr	B	Δ	Δ	Δ	Δ	Δ	Δ	C.00	C.	C	C.	C	C.			
1180	RPM	604	645	685	725	765	800	835	875	905	940	970	1005	1030			
	Turns Open	2	5.5	4.5	4	3	2	1.5	4	3.5	3	2	15	1			
		0.41	0.0	0.49	0.51	0.55	0.60	0.64	0.60	0.72	0.76	0.80	0.95				
	Sheave/Mtr	0.4 I	0.45	0.40	Δ	Δ	Δ	Δ	0.09	0.72	0.70	0.00	0.05				
1227		625	665	700	740	775	915	850	995	015	050	095	1015				
		025	- 005 - E	100	2.5	2	015	050	000	915	950	965	1015				
		0	5	4.5	3.5	3	2	0.00	4	3.5	2.5	2	1.5				
	BKVV	0.45	0.49	0.52	0.56	0.60	0.64	0.68	0.73	0.77	0.81	0.85	0.90				
1274	Sneave/witr	A 645	A COF	A 720	A 760	705	A	A		020		005	1025				
		045	000	120	700	795	030	005	900	930	900	995	1025				
	Turns Open	5.5	4.5	4	3	2.5	1.5	0.74	3.5	3	2.5	1.5	1				
	BKVV	0.49	0.53	0.57	0.61	0.05	0.69	0.74	0.78	0.82	0.80	0.91	0.96				
1322	Sneave/Mtr	A	A 705	A 745	A 700	A	A		010	045	075	1005	1025				
	RPM	605	705	745	780	810	845	880	910	945	9/5	1005	1035				
	Turns Open	5	4	3.5	2.5	2	1	4	3.5	2.5	2	1.5	1				
	BKVV	0.53	0.57	0.61	0.65	0.69	0.73	0.77	0.82	0.87	0.91	0.96	1.02				
1369	Sneave/witr	A	A 700	A 700	A 705	A	A		000	055	005	1045	1045				
		085	120	/00	195	025	000	690	920	905	965	1015	1045				
	Turns Open	4.5	4	3	2.5	1.5	1	4	3	2.5	2	1.5					
	BKW Shapita (MAt	0.58	0.62	0.67	0./1	0.75	0.79	0.84	0.88	0.93	0.97	1.03					
1416	Sneave/Ivitr	A 700	A 725	A 775	A	A QAE	075	010	040	070	1000	1020					
		100	130	115	010	040	0/0	910	940	9/0	1000	1030					
	Turns Open	4.5	3.5	2.5	2	1	4	3.5	3	2	1.5	1					
	BKW	0.64	0.68	0.72	0.76	0.80	0.85	0.90	0.97	1.02	1.07	1.12					
1463	Sneave/Mtr	A	A 755	A 700	A	A	000	000	055		0.1015	0					
		120	/ 55	190	025	000	890	920	955	965	1015	1040					
	Turns Open	4	3	2.5	1.5	1	4	3	2.5	2	1.5	1					
	BKW	0.70	0.75	0.80	0.85	0.90	0.94	0.99	1.03	1.08	1.13						
1510	Sneave/Mtr	A	A	A	A	075	0	0	0	0	0						
		740	115	810	840	875	905	935	965	995	1025						
	Turns Open	3.5	2.5	2	1.5	4	3.5	3	2.5	1.5	1	-					
	BkW	0.76	0.81	0.86	0.91	0.96	1.00	1.05	1.09	1.14	1.18						
1558	Sheave/Mtr	A	A	A	A	C	C	C	C	C	C						
	RPM	760	790	825	860	890	920	950	980	1010	1035						
	Turns Open	3	2.5	1.5	1	4	3	2.5	2	1.5	1						
	BkW	0.82	0.88	0.92	0.97	1.02	1.06	1.11	1.15	1.21							
1605	Sheave/Mtr	A	A	A	С	С	С	С	С	С							
1005	RPM	775	810	840	875	905	935	965	995	1025							
	Turns Open	3	2	1.5	4	3.5	3	2.5	2	1							
	BkW	0.89	0.94	0.99	1.03	1.08	1.12	1.17	1.21	1.26							
1652	Sheave/Mtr	A	A	A	С	С	С	С	С	С							
1052	RPM	795	825	860	890	920	950	980	1010	1035							
	Turns Open	2.5	1.5	1	4	3	2.5	2	1.5	1	_						

A = Standard Static/Standard Motor, B = Low Static/Standard Motor, C = High Static/Standard Motor. Unit factory shipped with standard static sheave and drive at 2.5 turns open. Other speed require field selection.

For applications requiring higher static pressures, contact your local representative. Performance data does not include drive losses and is based on sea level conditions. Do not operate in black regions. All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 380V for 380-420V units.

Blower Performance Data - TCH/V120 - Standard Unit

Airflow is I/s with wet coil and clean filter

1/0	De	0	05	50	75	400	4.05	450	475	000	005	050	075	200	205	250	075
1/5	Ра	0	25	50	/5	100	125	150	1/5	200	225	250	2/5	300	325	350	3/5
	BKVV		0.29	0.31	0.35	0.39	0.42	0.46	0.50	0.54	0.57	0.60	0.63	0.67	0.70	0.73	0.76
1038	Sheave/Mtr		В	В	B	В	A	A	A	A	A	A	С	С	С	С	С
1050	RPM		573	620	665	705	745	785	825	865	900	930	960	995	1020	1050	1075
	Turns Open		4.5	3.5	2.5	1.5	5.5	4.5	3.5	3	2	1.5	3.5	3	2.5	2	1.5
	BkW	0.30	0.33	0.37	0.40	0.43	0.46	0.50	0.54	0.58	0.61	0.65	0.68	0.72	0.76	0.80	0.85
	Sheave/Mtr	В	В	В	В	A	Α	А	Α	A	A	А	С	С	С	С	С
1086	RPM	547	594	640	680	720	760	800	840	875	910	940	975	1005	1035	1060	1090
	Turns Open	5	4	3	2	6	5	4	3.5	2.5	2	1.5	3.5	3	2	1.5	1
		0.34	0.27	0.40	0.42	0.47	0.50	0.55	0.50	0.62	0.66	0.70	0.72	0.77	0.92	0.96	
	Chassie /Mar	0.34	0.37	0.40	0.43	0.47	0.50	0.55	0.55	0.03	0.00	0.70	0.73	0.77	0.02	0.80	
1133	Sheave/with	D	D	D	D TOO	A 740	A	A	A	A	A	A	005	1045	1045	075	
	RPM	5/3	615	660	700	740	//5	815	855	890	920	955	985	1015	1045	1075	
	Turns Open	4.5	3.5	2.5	2	5.5	4.5	4	3	2.5	1.5	1	3	2.5	2	1.5	
	BKW	0.37	0.40	0.44	0.47	0.51	0.55	0.60	0.64	0.68	0.71	0.75	0.78	0.82	0.87	0.91	
1180	Sheave/Mtr	В	В	В	A	A	A	A	A	A	A	С	С	С	С	С	
	RPM	594	635	675	715	755	790	830	865	900	930	965	995	1025	1055	1085	
	Turns Open	4	3	2.5	6	5	4.5	3.5	3	2	1.5	3.5	3	2.5	1.5	1	
	BkW	0.40	0.44	0.47	0.51	0.55	0.59	0.63	0.67	0.72	0.75	0.79	0.83	0.88	0.92	0.96	
4007	Sheave/Mtr	В	В	В	A	A	A	A	A	A	A	С	С	С	С	С	
1227	RPM	615	655	690	730	770	805	840	875	910	940	975	1005	1035	1065	1095	
	Turns Open	3.5	3	2	5.5	5	4	3.5	2.5	2	1	3.5	3	2	1.5	1	
	BkW	0.44	0.47	0.51	0.55	0.59	0.63	0.67	0.71	0.75	0.79	0.84	0.88	0.93	0.97		
	Sheave/Mtr	B	B	B	Δ	Δ	Δ	Δ	Δ	Δ	Δ	C	C	C	C	-	
1274	RPM	635	670	710	750	785	820	855	885	920	950	985	1015	1045	1075		
		3	2.5	15	5	100	3.5	3	2.5	1.5	1	3	2.5	2	15		
		0.47	2.5	0.55	0.50	4.5	0.67	0.70	0.76	0.90	0.94	0.90	2.5	1.00	1.05		
	Chaovo/Mt-	U.47	0.01	0.55	0.59	0.04	0.07	0.72	0.70	0.00	0.04	0.09	0.94	1.00	1.05		
1322	Sileave/IVItr	650	600	A 705	A 705	A	A	A	A 0000	A 0000	000	005	1005	1055	1005		
	KPM	050	090	125	/ 05	800	830	865	900	930	960	995	1025	1055	1085		
	Turns Open	3	2	6	C C	4	3.5	3	2	1.5	3.5	3	2.5	1.5	1		
	BkW	0.52	0.55	0.59	0.63	0.67	0.71	0.75	0.80	0.85	0.89	0.94	0.99	1.04	1.10	-	
1369	Sheave/Mtr	В	В	A	A	A	A	A	A	A	С	С	С	С	С		
1000	RPM	670	705	745	780	810	845	875	910	940	970	1000	1030	1060	1090		
	Turns Open	2.5	1.5	5.5	4.5	4	3	2.5	2	1	3.5	3	2	1.5	1		
	BkW	0.57	0.60	0.65	0.68	0.73	0.77	0.82	0.86	0.91	0.95	1.00	1.05	1.11			
1446	Sheave/Mtr	В	A	A	A	A	A	A	A	A	С	С	С	С			
1416	RPM	685	720	760	790	825	860	895	925	955	985	1015	1045	1075			
	Turns Open	2	6	5	4.5	3.5	3	2	1.5	1	3	2.5	2	1.5			
	BkW	0.61	0.66	0.70	0.75	0.79	0.82	0.89	0.94	0.99	1.05	1.09	1.15	1.20			
	Sheave/Mtr	В	A	A	A	A	A	A	A	C	C	C	C	С			
1463	RPM	700	735	775	810	845	875	910	940	970	1000	1025	1055	1085			
	Turns Open	2	5.5	4.5	4	3	2.5	2	1.5	3.5	3	2.5	1.5	1			
		0.69	0.72	9.5		0.00	0.02	0.06	1.01	1.05	1 10	1.16	1.0	1.26			
	Shooyo/Mtr	0.00	0.75	0.77	0.02	0.00	0.92	0.90	1.01	1.03	1.10	1.10	1.20 C	1.20			
1510	Sneave/Iviti	A 705	700	700	A	A	A	A 000	A 050		1010	4040	4005	4005			
		725	760	790	025	000	890	920	950	960	1010	1040	1065	1095			
	Turns Open	6	5	4.5	3.5	3	2	1.5	1	3.5	2.5	2	1.5	1			
	BKW	0.74	0.79	0.83	0.88	0.94	0.98	1.02	1.07	1.11	1.16	1.21	1.26				
1558	Sheave/Mtr	A	A	A	A	A	A	A	C	C	C	C	C				
	RPM	740	775	805	840	875	905	935	965	995	1020	1050	1075				
	Turns Open	5.5	4.5	4	3.5	2.5	2	1.5	3.5	3	2.5	2	1.5				
	BkW	0.79	0.85	0.89	0.94	0.99	1.04	1.08	1.12	1.17	1.23	1.29	1.35				
1605	Sheave/Mtr	A	A	A	A	A	A	A	С	С	С	С	С				
1005	RPM	755	790	820	855	890	920	945	975	1005	1035	1060	1090				
	Turns Open	5	4.5	3.5	3	2	1.5	1	3.5	3	2	1.5	1				
	BkW	0.87	0.91	0.96	1.02	1.06	1.11	1.15	1.20	1.24	1.29	1.34					
4050	Sheave/Mtr	A	A	A	A	A	A	С	C	С	С	С					
1652	RPM	780	810	845	880	910	940	970	1000	1025	1050	1080					
	Turns Open	4.5	4	3	2.5	2	1	3.5	3	2.5	2	1	-				
	BkW	0.94	0.99	1.04	1.09	1.15	1.20	1.25	1.30	1.35	1.40	1.45					
	Sheave/Mtr	A	A	A	A	A	C	C	C	C	С	С					
1699	RPM	805	835	870	900	930	960	990	1015	1045	1070	1100	-				
	Turns Open	4	3.5	2.5	2	1.5	3.5	3	25	2	15	1	-				
	BkW	1.01	1.05	1 10	1 16	1.0	1.26	1 32	1 37	1 4 3	1.0						
	Shooyo/Mtr	1.01	1.00	1.10	1.10	1.21	C	C	C	1.40 C	1.40 C	-					
1746		0.05	055	005	015	045	075	1005	1020	1060	1095	-					
	Turna On an	025	000	000	915	945	975	1005	1030	1060	1065						
	Turns Open	3.5	3	2.5	1.5	4.07	3.5	3	2	1.5	1						
	BkW	1.07	1.11	1.1/	1.22	1.27	1.33	1.38	1.45	1.51	1.57						
1794	Sneave/Mtr	A	A	A	A	C	C	C	C		U tor-						
	RPM	840	870	900	930	960	990	1015	1045	1070	1095						
	Turns Open	3.5	2.5	2	1.5	3.5	3	2.5	2	1.5	1						
	BkW	1.17	1.21	1.27	1.32	1.38	1.43	1.49	1.55	1.62							
1844	Sheave/Mtr	A	A	A	A	С	С	С	С	С							
1041	RPM	860	885	915	945	975	1005	1030	1055	1085							
	Turns Open	3	2.5	1.5	1	3.5	3	2	1.5	1							
	BkW	1.23	1.29	1.35	1.41	1.48	1.53	1.60	1.66	1.72							
4000	Sheave/Mtr	A	A	A	С	С	С	С	С	С							
1888	RPM	875	900	930	960	990	1015	1045	1070	1095							
	Turns Open	2.5	2	1.5	3.5	3	2.5	2	1.5	1							

A = Standard Static/Standard Motor, B = Low Static/Standard Motor, C = High Static/Standard Motor. Unit factory shipped with standard static sheave and drive at 2.5 turns open. Other speed require field selection. For applications requiring higher static pressures, contact your local representative. Performance data does not include drive losses and is based on sea level conditions. Do not operate in black regions. All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.

Blower Performance Data - TCV160 - Standard Unit

Airflow is I/s with wet coil and clean filter

l/s	Pa	0	25	50	75	100	125	150	175	200	225	250	275	300
	BkW				0.28	0.33	0.38	0.43	0.48	0.54	0.58	0.62	0.67	0.72
	Sheave/Mtr				В	В	A	A	А	А	С	С	С	С
1416	RPM				542	594	645	685	730	770	800	830	860	890
	Turns Open				2.5	1	4.5	3.5	3	1.5	3.5	3	2	1
	BkW			0.26	0.31	0.37	0.42	0.47	0.53	0.57	0.62	0.67	0.72	0.77
1510	Sheave/Mtr			В	В	В	A	А	А	А	С	С	С	С
1010	RPM			500	552	609	655	695	740	775	810	845	880	905
	Turns Open			4	2	5.5	4.5	3.5	2.5	1	3.5	2.5	1.5	1
	BkW			0.29	0.35	0.41	0.47	0.52	0.57	0.62	0.66	0.71	0.76	
1605	Sheave/Mtr			В	В	A	A	A	A	A	С	С	С	
	RPM			510	568	620	665	710	750	790	825	860	890	
	Turns Open			3.5	1.5	5.5	4	3	2	1	3	2	1	
	BkW			0.33	0.39	0.45	0.51	0.56	0.61	0.66	0.70	0.74	0.81	
1699	Sheave/Mtr			В	В	A	A	A	A	C	С	С	С	
	RPM			526	578	630	675	720	760	800	835	870	900	
	Turns Open			3	1.5	5	4	3	1.5	3.5	2.5	2	1	
	BkW			0.39	0.45	0.51	0.57	0.64	0.70	0.77	0.84	0.91		
1794	Sheave/Mtr			В	В	A	A	A	A	С	С	С		
	RPM			536	589	640	680	725	765	805	845	880		
	Turns Open			2.5	1	4.5	4	2.5	1.5	3.5	2.5	1.5		
	BkW		0.41	0.45	0.50	0.57	0.65	0.72	0.79	0.86	0.93	1.00		
1888	Sheave/Mtr		В	В	A	A	A	A 705	A	045	050	000		
	RPM		505	552	604	650	695	735	//5	815	850	890		
	Turns Open		3.5	2	0	4.5	3.5	2.5	1	3	2	1.5		
	DKVV Shooyo/Mtr		U.40	0.54	0.62	0.67	0.73	0.79	0.07	0.95	1.02	1.06		
1982			D 501	D	A 620	A 660	705	745	705	025	960	005		
			321	1.5	5.5	000	705	2	100	3	2000	1		
	BkW		0.53	0.59	0.64	0.72	0.79	0.86	0.94	1.02	1 10	1 16		
	Sheave/Mtr		0.00 B	0.00 B	0.04 A	0.72 A	0.73 A	0.00 A	0.34 C	C	C	C		
2077	RPM		536	583	630	675	715	755	795	835	875	905		
	Turns Open		2.5	1.5	5	4	3	2	3.5	2.5	1.5	1		
	BkW	0.52	0.60	0.67	0.74	0.80	0.86	0.93	1.01	1.09	1.16			
	Sheave/Mtr	В	В	A	A	A	A	A	С	С	С			
2171	RPM	500	552	599	645	685	725	765	805	845	880			
	Turns Open	4	2	6	4.5	3.5	2.5	1.5	3.5	2.5	1.5			
	BkW	0.59	0.66	0.73	0.80	0.87	0.93	1.00	1.10	1.19	1.27			
	Sheave/Mtr	В	В	A	A	A	A	A	С	С	С			
2266	RPM	521	568	615	660	700	740	775	815	855	890			
	Turns Open	3	1.5	5.5	4	3.5	2.5	1.5	3	2	1			
	BkW	0.66	0.72	0.79	0.86	0.94	1.01	1.10	1.19	1.27	1.35			
0000	Sheave/Mtr	В	В	A	A	А	A	А	С	С	С			
2360	RPM	542	583	630	670	715	755	790	825	860	895			
	Turns Open	2.5	1.5	5	4	3	2	1	3	2	1			

A = Standard Static/Standard Motor, B = Low Static/Standard Motor, C = High Static/Standard Motor. Unit factory shipped with standard static sheave and drive at 2.5 turns open. Other speed require field selection. For applications requiring higher static pressures, contact your local representative. Performance data does not include drive losses and is based on sea level conditions. Do not operate in black regions. All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.

Blower Performance Data - TCV192 - Standard Unit

Airflow is I/s with wet coil and clean filter

l/s	Pa	0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
	BkW		0.28	0.33	0.39	0.44	0.49	0.55	0.59	0.63	0.68	0.73	0.78	0.83	0.88	0.93	0.97
	Sheave/Mtr		В	В	A	A	A	A	A	A	с	С	с	С	С	С	С
1510	RPM		516	568	625	665	710	755	785	820	855	885	910	935	960	985	1005
	Turns Open		5	3.5	6	5	4	2.5	2	1	5.5	4.5	4	3.5	3	2.5	1.5
	BkW		0.30	0.37	0.42	0.48	0.53	0.58	0.63	0.67	0.71	0.77	0.82	0.88	0.94	0.99	1.03
	Sheave/Mtr		В	В	A	A	A	A	A	С	с	С	с	С	С	С	С
1605	RPM		521	578	630	675	715	760	795	830	865	895	920	950	975	1000	1020
	Turns Open		5	3.5	5.5	4.5	3.5	2.5	1.5	6	5	4.5	3.5	3	2.5	2	1.5
	BkW		0.34	0.40	0.46	0.51	0.57	0.62	0.66	0.71	0.75	0.82	0.88	0.94	1.01	1.07	1.12
	Sheave/Mtr		В	В	A	A	A	A	A	С	с	С	с	С	С	С	с
1699	RPM		531	583	635	680	725	765	800	840	875	905	930	955	985	1010	1030
	Turns Open		4.5	3	5.5	4.5	3.5	2.5	1.5	5.5	5	4	3.5	3	2.5	1.5	1
	BkW		0.39	0.45	0.51	0.57	0.64	0.70	0.77	0.84	0.91	0.96	1.01	1.07	1.12	1.17	1.23
	Sheave/Mtr		В	В	A	A	A	A	A	С	С	С	с	С	С	С	С
1794	RPM		536	589	640	680	725	765	805	845	880	910	940	970	1000	1020	1045
	Turns Open		4.5	3	5	4.5	3	2	1.5	5.5	4.5	4	3	2.5	2	1.5	1
	BkW	0.40	0.45	0.50	0.56	0.64	0.72	0.79	0.86	0.93	0.99	1.04	1.11	1.16	1.22	1.28	
	Sheave/Mtr	В	В	В	A	A	A	A	A	С	с	С	с	с	С	С	
1888	RPM	500	547	599	645	690	735	775	810	850	885	915	950	980	1010	1035	
	Turns Open	6	4	2.5	5	4	3	2	1	5	4.5	3.5	3	2.5	1.5	1	
	BkW	0.46	0.53	0.60	0.67	0.72	0.78	0.85	0.93	1.01	1.07	1.14	1.19	1.24	1.31	1.37	
	Sheave/Mtr	В	В	В	A	A	A	A	A	С	С	С	с	С	С	С	
1982	RPM	510	557	609	655	695	735	775	815	855	890	925	955	985	1015	1040	
	Turns Open	5.5	4	2.5	5	4	3	2	1	5	4.5	3	3	2	1.5	1	
	BkW	0.51	0.57	0.62	0.70	0.77	0.84	0.91	0.99	1.07	1.14	1.21	1.27	1.33	1.39	1.45	
	Sheave/Mtr	В	В	В	A	A	A	A	A	С	С	С	с	С	С	С	
2077	RPM	521	568	615	660	700	745	780	820	860	895	930	960	990	1020	1045	
	Turns Open	5	3.5	2	4.5	3.5	2.5	2	1	5	4	3	2.5	2	1.5	1	
	BkW	0.58	0.65	0.73	0.79	0.85	0.91	0.99	1.06	1.14	1.22	1.28	1.36	1.42	1.51		
	Sheave/Mtr	В	В	A	A	A	A	A	С	С	С	С	С	С	С		
21/1	RPM	536	583	635	675	715	755	795	830	870	905	935	970	1000	1030		
	Turns Open	4.5	3	5.5	4.5	3.5	2.5	1.5	6	4.5	4	3	2.5	2	1		
	BkW	0.65	0.72	0.78	0.85	0.92	0.98	1.07	1.17	1.24	1.31	1.38	1.44	1.53	1.60		
	Sheave/Mtr	В	В	A	A	A	A	A	С	С	С	С	С	С	С		
2266	RPM	557	604	645	690	730	765	805	845	880	910	945	975	1010	1035		
	Turns Open	4	2.5	5	4	3	2.5	1.5	5.5	4.5	4	2.5	2.5	1.5	1		
	BkW	0.71	0.78	0.85	0.92	0.99	1.08	1.17	1.26	1.34	1.40	1.48	1.54	1.62	1.71		
2200	Sheave/Mtr	В	A	A	A	A	A	A	С	С	С	С	С	С	С		
2300	RPM	573	620	660	705	745	780	820	855	890	920	955	985	1015	1045		
	Turns Open	3.5	6	5	4	3	2	1	5	4.5	3.5	2.5	2	1.5	1		
	BkW	0.78	0.85	0.92	0.99	1.06	1.14	1.24	1.32	1.41	1.48	1.56	1.63	1.72			
2454	Sheave/Mtr	В	A	A	A	A	A	с	С	с	с	С	с	с			
	RPM	599	640	680	720	755	790	830	865	900	930	965	995	1025			
	Turns Open	3	5.5	4.5	3.5	2.5	1.5	6	5	4	3.5	2	2	1.5			
	BkW	0.84	0.92	0.99	1.07	1.14	1.22	1.30	1.38	1.46	1.56	1.64	1.74	1.83			
2549	Sheave/Mtr	В	A	A	A	A	A	С	С	С	С	С	С	С			
	RPM	615	655	695	735	770	805	840	875	905	940	970	1005	1035			
	Turns Open	2.5	5	4	3	2	1.5	5.5	4.5	3.5	3	2	2	1			
	BkW	0.92	0.99	1.07	1.15	1.24	1.32	1.40	1.49	1.57	1.66	1.74	1.85	1.94			
2643	Sheave/Mtr	A	A	A	A	A	A	С	С	С	С	С	С	С			
	RPM	635	670	710	750	785	820	850	885	915	950	980	1015	1040			
	Turns Open	5.5	4.5	3.5	2.5	2	1	5	4.5	3.5	3	2	1.5	1			
	BkW	1.00	1.08	1.15	1.23	1.30	1.39	1.47	1.56	1.65	1.74	1.84	1.94	2.05			
2738	Sheave/Mtr	A	A	A	A	A	С	С	С	С	С	С	С	с			
	RPM	650	690	725	765	795	830	865	895	925	955	990	1020	1050			
	Turns Open	5	4	3	2.5	1.5	6	4.5	4	3	3	1.5	1.5	1			

A = Standard Static/Standard Motor, B = Low Static/Standard Motor, C = High Static/Standard Motor. Unit factory shipped with standard static sheave and drive at 2.5 turns open. Other speed require field selection. For applications requiring higher static pressures, contact your local representative. Performance data does not include drive losses and is based on sea level conditions. Do not operate in black regions. All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.

Blower Performance Data - TCV240 - Standard Unit

Airflow is I/s with wet coil and clean filter

l/s	Pa	0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375
-	RkW/				0.57	0.65	0.73	0.80	0.86	0.94	1.00	1.05	1 12	1 17	1.22	1.28	1 3/
	Sheave/M#r				0.07 B	0.00 R	۸.	Λ	Λ.00	Δ.34	۸	0.00	0	·	r.20	r.20	0
1888	DDM				650	D 605	740	700	A	0FF	A	000	055	085	1045	1025	1000
	T O				000	095	740	700	015	000	090	920	900	900	1015	1035	1000
	Turns Open				5	3.5	6	4.5	3.5	2	1.5	3.5	2.5	2	1	0.5	0
	BKVV				0.68	0.73	0.79	0.87	0.95	1.03	1.09	1.15	1.21	1.26	1.32	1.38	
1982	Sheave/Mtr				В	В	A	A	A	A	A	C	C	C	C	C	
	RPM				665	705	745	785	825	865	900	930	965	995	1020	1045	
	Turns Open				4.5	3.5	5.5	4	3	2	1	3.5	2.5	1.5	0.5	0.5	
	BkW			0.64	0.72	0.79	0.86	0.94	1.02	1.10	1.16	1.23	1.29	1.35	1.42	1.48	
2077	Sheave/Mtr			В	В	В	A	A	A	A	С	С	С	С	С	С	
	RPM			630	675	715	755	795	835	875	905	940	970	1000	1030	1055	
	Turns Open			6	4.5	3	5	4	3	1.5	4	3	2	1.5	0.5	0	
	BkW			0.74	0.80	0.86	0.93	1.01	1.08	1.16	1.24	1.30	1.38	1.45	1.53	1.62	
2171	Sheave/Mtr			В	В	В	Α	A	A	A	С	С	С	С	С	С	
	RPM			645	685	725	765	805	840	880	915	945	980	1010	1035	1065	
	Turns Open			5.5	4	3	5	3.5	2.5	1.5	4	3	2	1	0.5	0	
	BkW	ļ		0.80	0.86	0.92	1.00	1.08	1.18	1.26	1.33	1.39	1.46	1.54	1.63		
2266	Sheave/Mtr			В	В	A	A	A	A	A	С	С	С	С	С		
	RPM			655	695	735	775	810	850	885	920	950	985	1015	1045		
	Turns Open			5	3.5	6	4.5	3.5	2.5	1	3.5	2.5	2	1	0		
	BkW		0.79	0.85	0.93	1.00	1.09	1.17	1.27	1.35	1.41	1.49	1.55	1.63	1.72		
2360	Sheave/Mtr		В	В	В	A	A	A	A	A	С	С	С	С	С		
	RPM		625	665	710	750	785	820	860	895	925	960	990	1020	1050		
	Turns Open		6	5	3.5	5.5	4.5	3	2	1	3.5	2.5	1.5	1	0		
	BkW		0.85	0.92	0.99	1.07	1.15	1.24	1.32	1.41	1.48	1.56	1.65	1.72	1.81		
2454	Sheave/Mtr		В	В	В	A	A	A	A	A	С	С	С	С	С		
2434	RPM		640	680	720	760	795	830	865	900	930	965	1000	1025	1055		
	Turns Open		5.5	4.5	3	5	4	3	2	1	3	2	1.5	0.5	0		
	BkW		0.92	0.99	1.07	1.14	1.22	1.30	1.38	1.46	1.56	1.64	1.72	1.81	1.90		
2540	Sheave/Mtr		В	В	A	A	A	A	A	С	С	С	С	С	С		
2549	RPM		655	695	735	770	805	840	875	905	940	970	1000	1030	1060		
	Turns Open		5	4	6	4.5	3.5	2.5	1.5	4	3	2	1.5	0.5	0		
	BkW	0.91	0.99	1.07	1.15	1.24	1.31	1.40	1.49	1.57	1.66	1.74	1.83	1.94			
	Sheave/Mtr	В	В	В	A	A	A	A	A	С	С	С	С	С			
2643	RPM	630	670	710	750	785	815	850	885	915	950	980	1010	1040			
	Turns Open	6	4.5	3.5	5.5	4	3.5	2.5	1.5	3.5	2.5	2	1	0.5			
	BkW	0.99	1.07	1.15	1.22	1.30	1.39	1.46	1.56	1.65	1.74	1.83	1.92	2.03			
	Sheave/Mtr	В	В	В	A	A	A	A	A	С	С	С	С	С			
2738	RPM	645	685	725	760	795	830	860	895	925	955	985	1015	1045			
	Turns Open	5.5	4	3	5	4	3	2	1	3.5	2.5	1.5	1	0			
	BkW	1.08	1.16	1.24	1.33	1.42	1.50	1.57	1.68	1.77	1.86	1.94	2.05	2.14			
	Sheave/Mtr	В	В	В	A	A	A	A	С	С	С	с	С	С			
2832	RPM	660	700	735	775	810	845	875	910	940	970	1000	1030	1055			
	Turns Open	5	3.5	3	4.5	3.5	2.5	1.5	4	3	2	1.5	0.5	0			
	BkW	1.17	1.26	1.35	1.43	1.51	1.60	1.70	1.81	1.91	2.02	2.13	2.24	2.33			
	Sheave/Mtr	В	в	A	A	A	A	A	с	с	с	с	с	С			
2926	RPM	675	715	750	785	820	855	890	920	950	980	1010	1040	1065			
	Turns Open	4.5	3	5.5	4	3	2	1	3.5	2.5	2	1	0.5	0			
	BkW	1.29	1.39	1.48	1.59	1.68	1.78	1.87	1.96	2.05	2.14	2.24	2.35				
	Sheave/Mtr	В	A	A	A	A	A	с	с	с	с	с	С				
3021	RPM	695	735	770	805	835	870	900	930	960	990	1020	1050				
	Turns Open	4	6	5	3.5	3	2	4	3	2.5	1.5	1	0.5				
	BkW	1.41	1.50	1.60	1.69	1.80	1.90	1.99	2.08	2.17	2.24	2.35	2.44				
	Sheave/Mtr	В	A	A	A	A	A	С	С	с	С	С	С				
3115	RPM	715	750	785	815	850	885	915	945	975	1000	1030	1055				
	Turns Open	3.5	5.5	4.5	3.5	2.5	1.5	3.5	3	2.5	1.5	0.5	0				
	BkW	1.52	1.60	1.71	1.81	1.91	2.00	2.09	2.18	2.27	2.38	2.49	2.59				
	Sheave/Mtr	A	A	Α	A	A		<u> </u>	C	C.	C.	C.	C.				
3210	RPM	730	760	795	830	865	895	925	955	985	1015	1040	1065				
	Turns Open	6	5	A	3	2	1	3	2.5	2	1	0.5	0				
	BkW/	1.63	1 72	1.83	1 03	2.02	2 11	2 20	2.0	238	2.48	2.57	5				
	Sheave/Mtr	1.03 A	1.1Z	1.00 A	1.93	2.02	2.11 C	2.20 C	2.23	2.30	2.40	2.07					
3304	DDM	7/5	775	810	845	975	005	025	065	005	1025	1050					
		55	4.5	3.5	25	15	1	25	200	395	1020	0.00					

A = Standard Static/Standard Motor, B = Low Static/Standard Motor, C = High Static/Standard Motor. Unit factory shipped with standard static sheave and drive at 2.5 turns open. Other speed require field selection.

For applications requiring higher static pressures, contact your local representative. Performance data does not include drive losses and is based on sea level conditions. Do not operate in black regions. All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.

Blower Performance Data - TCV300 - Standard Unit

Airflow is I/s with wet coil and clean filter

l/s	Ра	0	25	50	75	100	125	150	175	200	225	250	275	300	325	35	375
	BkW	0.91	1.03	1.14	1.24	1.34	1.45	1.53	1.62	1.70	1.78	1.87	1.96	2.05	2.14	2.23	2.31
0000	Sheave/Mtr	В	В	В	В	A	A	A	A	A	A	A	С	С	С	С	С
2832	RPM	670	715	755	795	830	870	900	1	965	995	1020	1045	1070	1095	1120	1140
	Turns Open	6	5	3.5	2.5	5.5	5	4	3	2	1.5	1	3.5	2.5	2	1	1
	BkW	1.08	1.16	1.27	1.39	1.51	1.61	1.71	1.79	1.87	1.96	2.05	2.14	2.23	2.32	2.42	
2074	Sheave/Mtr	В	В	В	В	A	A	A	A	A	A	С	С	С	С	С	
25/4	RPM	695	735	775	815	855	890	925	955	985	1015	1040	1065	1090	1115	1140	
	Turns Open	5.5	4.5	3	2	5	4	3.5	2.5	1.5	1	3.5	3	2	1.5	1	
	BkW	1.20	1.31	1.43	1.53	1.64	1.75	1.84	1.93	2.04	2.13	2.22	2.32	2.41	2.51	_	
3115	Sheave/Mtr	В	В	В	A	A	A	A	A	A	A	С	С	С	С	-	
	RPM	720	760	800	835	875	910	940	970	1005	1030	1055	1085	1110	1135	_	
	Turns Open	5	3.5	2.5	5.5	4.5	3.5	3	2	1.5	0.5	3	2.5	1.5	1		
	BKW	1.32	1.44	1.56	1.68	1.79	1.89	2.00	2.12	2.22	2.36	2.47	2.60	2.71	-		
3257	Sheave/Mtr	B 740	B 700	A 820	A	A	A 025	A	A 005	A 1020	1050	1075	C 1105	U 1120	-		
		/40	760	620	60U	695	925	960	995	1020	1050	1075	1105	1130			
		4	1 61	173	1.97	4	2.07	2.5	1.0	2.40	2.54	2.5	2.81	2.80	-		
	Sheave/Mtr	1.47 B	1.01 B	Δ	Δ	Δ	Δ	Δ	Δ	2.40	2.34	2.07	2.01	2.09	-		
3398	RPM	765	805	840	880	910	945	975	1005	1035	1065	1095	1125	1145	-		
	Turns Open	3.5	2	5.5	4.5	3.5	3	2	1	3.5	2.5	2	1	1	-		
	BkW	1.65	1 78	1.91	2.03	2 14	2 23	2.34	2 47	2.58	2.0	2 85	2.96				
	Sheave/Mtr	B	A	A	A		A	A		C	C	C	C	-			
3540	RPM	790	825	860	895	930	960	995	1025	1050	1080	1110	1135				
	Turns Open	2.5	6	5	4	3.5	2.5	1.5	0.5	3	2	1.5	1	-			
	BkW	1.79	1.91	2.04	2.16	2.27	2.40	2.51	2.65	2.78	2.92	3.05					
	Sheave/Mtr	В	A	A	A	A	A	A	С	С	С	С	-				
3682	RPM	810	845	880	915	945	980	1010	1040	1070	1100	1130	-				
	Turns Open	2	5.5	4.5	3.5	3	2	1	3.5	2.5	1.5	1	-				
	BkW	1.99	2.12	2.24	2.36	2.50	2.63	2.76	2.89	3.03	3.17	3.30					
3823	Sheave/Mtr	A	A	A	A	A	A	С	С	С	С	С					
5025	RPM	850	885	915	945	980	1010	1040	1070	1100	1130	1155	_				
_	Turns Open	5.5	4.5	3.5	3	2	1	3.5	2.5	1.5	1	1					
	BkW	2.21	2.33	2.47	2.59	2.75	2.88	3.04	3.20	3.37	3.50						
3965	Sheave/Mtr	A	A	A	A	A	C	C	C	C	C						
	RPM	880	910	945	975	1010	1035	1065	1095	1125	1150						
	Turns Open	5	3.5	3	2	1	3.5	2.5	2	1	1						
	BKW Chaster	2.40	2.54	2.67	2.81	2.97	3.13	3.29	3.45	3.59							
4106	DDM	A 010	040	070	A 1000	1030	1060	1000	1120	1145							
		310	340	2	1000	3.5	2.5	2	15	1	-						
	BkW	2 65	2 78	2.92	3.08	3.24	3.40	3.54	3 70	1							
	Sheave/Mtr	A	A	A	C	C.	C	C	C	-							
4248	RPM	940	970	1000	1030	1060	1090	1115	1145	-							
1	Turns Open	3	2	1.5	3.5	2.5	2	1.5	1	-							
	BkW	2.98	3.14	3.30	3.46	3.60	3.76	3.90									
	Sheave/Mtr	A	A	С	С	С	С	С									
4390	RPM	970	1000	1030	1060	1085	1115	1140									
	Turns Open	2	1.5	3.5	2.5	1.5	1.5	1									
	BkW	3.25	3.42	3.55	3.71	3.85	4.02										
4531	Sheave/Mtr	A	С	С	С	С	С										
4001	RPM	1000	1030	1055	1085	1110	1140										
	Turns Open	1.5	3	3	1.5	1	1	_									
	BkW	3.50	3.66	3.80	3.96	4.10	4.26	_									
4673	Sheave/Mtr	A	С	С	С	С	С										
	RPM	1025	1055	1080	1110	1135	1160										
	Turns Open	1	2.5	2.5	1	1	1										
	BKW Chaster	3.95	4.14	4.29	4.43												
4814	Sneave/Mtr	1075	U 4405	U	U												
		25	1105	15	1155												
	I rums Open	∠.⊃	G.I	I.J													

A = Standard Static/Standard Motor, B = Low Static/Standard Motor, C = High Static/Standard Motor. Unit factory shipped with standard static sheave and drive at 2.5 turns open. Other speed require field selection. For applications requiring higher static pressures, contact your local representative. Performance data does not include drive losses and is based on sea level conditions. Do not operate in black regions. All airflow is rated at lowest Voltage if unit is dual Voltage rated, i.e. 208V for 208-230V units.

TCH Physical Data

MODEL TCH072-120	072	096	120		
Compressor		Scroll			
Number of Circuits (Compressors)		2			
Factory Charge R410a - kg per circuit	1.7	2.15	2.27		
Blower Motor					
Blower Motor Quantity		1			
Standard Motor kW	.75	1.12	2.23		
Blower					
No. of Blowers		1			
Blower Wheel Size D x W cm		30.48 x 30.48			
Water Connection Size					
FPT (in) [mm]	1-1/4"	[31.8]	1-1/2" [38.1]		
Coax Volume					
Volume Liters	6.13	6.85	9.08		
Condensate Connection Size					
FPT (in) [mm]		3/4" [19.1]			
Air Coil Data					
Air Coil Dimensions H x W (cm)	81.28 x 86.36	91.44 x	91.44		
Air Coil Total Face Area (m ²)	7.6 0.71	9.0 0	.84		
Air Coil Tube Size (cm)		0.953			
Air Coil Fin Spacing (fins per cm)	5.5				
Air Coil Number of Rows	3				
Miscellaneous Data					
Filter Standard - 25.4mm Throwaway (qty) cm	(QTY.3) 40.6 x 50.8 & (QTY.1) 50.8 x				
Weight - Operating kg	265.8	292.1	316.6		
Weight - Packaged kg	283.9	310.3	334.8		

All units have grommet compressor mountings, and 2.2cm & 2.9cm electrical knockouts.

Unit Maximum Water Working Pressure	Max Pressure [kPa]
Base Unit	3447

TCH072-120 Corner Weights	TCH072	TCH096	TCH120
Weight - Operating [kg]	265.8	292.1	316.6
Weight - Packaged [kg]	283.9	310.3	334.8
Weight - Corner - Control box/Compressor side [kg]	106.6	115.2	122.9
Weight - Corner - Compressor side [kg]	45.8	54.4	62.1
Weight - Corner - Blower side side [kg]	81.6	86.2	90.7
Weight - Corner - Air Coil side [kg]	31.8	36.3	40.8

TCH072-120 Dimensional Data



Mode	el	А	в	С	D	E	F	G	к	L	М	0	Р	Q	R	S	т	U	v
		Depth	Width	Height		Supply Depth	Supply Width	Supply Height		1 Water Outlet	2 Water Inlet					Return Depth	Return Height		
072-120	cm.	92.2	215.6	54.9	35.6	43.2	34.3	19.8	38.1	21.1	10.2	5.1	47.8	42.7	35.1	165.1	45.7	2.5	48.0

TC_L SERIES 50HZ - HFC410A SUBMITTAL DATA ENG/S-I TCV Physical Data

MODEL TCV072-300	072	096	120	160	192	240	300
Compressor				Scroll			
Number of Circuits (Compressors)				2			
Factory Charge R410a - kg per circuit	1.7	2.15	2.27	3.18	3.86	5.56	6.35
Blower Motor							
Blower Motor Quantity				1			
Standard Motor kW	.75	1.12	2.23	2.24	3.73	5.60	
Blower							
No. of Blowers		1			2		3
Blower Wheel Size D x W cm				30.48 x 30.48			
Water Connection Size							
FPT (in) [mm]	1-1/4" [3	31.8]	1-1/2" [38.1]		2" [50.8]		2-1/2" [63.5]
Coax Volume							
Volumne liters	6.13	6.85	9.08	13.70	18.28	18.55	27.98
Condensate Connection Size							
FPT (in) [mm]				3/4" [19.1]			
Air Coil Data							
Air Coil Dimensions H x W (in) [cm]	81.28 x 86.36	91.44	x 91.44		91.44 x	193.04	
Air Coil Total Face Area (ft ²) [m ²]	0.71	0	.84		1.	77	
Air Coil Tube Size cm				0.953			
Air Coil Fin Spacing fins per cm			5.	5			4.72
Air Coil Number of Rows		3		2	3	3	4
Miscellaneous Data							
Filter Standard - 25.4mm Throwaway (qty) cm	(QT)	(QTY.2) 50.80)x 76.2				
Weight - Operating kg	265.8	292.1	316.6	484.9	528	537.1	588.3
Weight - Packaged kg	283.9	310.3	334.8	521.2	564.3	573.3	624.6

All units have grommet compressor mountings, and 2.2cm & 2.9cm electrical knockouts.

Unit Maximum Water Working Pressure	Max Pressure (kPa)
Base Unit	3447

TCV072-120 Dimensional Data

ALL CONFIGURATIONS REQUIRE SERVICE ACCESS AREA DESCRIBED IN NOTES 7, 8, 9, AND 10.

NOTES:

All dimensions in table are cm.



REAR RETURN TOP DISCHARGE (RR/TD)

() () () () () () () () () () () () () (RETURN AIR RETURN AIR Control Box CSP+CAP+MSP		BLOWER ROTATION	BLOWER TO AIR COI RELATIONSHIP FOR TOP DISCHARGE 072-120
FRO	NT RETURN TOP DISCHAR	<u>GE (FR/TD)</u>		

LEGEND	TCV072-096	TCV120
①Water Inlet (See Note 2)	1-1/4" FPT	1-1/2" FPT
② Water Outlet (See Note 2)	1-1/4" FPT	1-1/2" FPT
③ Condensate Drain (See Note 3)	1" FP	Т
④ High Voltage Access (See Note 4)	1-3/8" [3.49	9 CM]
(5) Low Voltage Access (See Note 4)	7/8" [2.2	CM]
BSP - Blower Service Panel		
CAP - Control Access Panel		
CSP - Compressor Access Panel		
MSP - Motor Service Panel		

NRP - Non Removable Panel UPA - Upper Pulley Access

4.32





ALL CONFIGURATIONS



RETURN AIF

1

3

4

5

4

NR

2

1. While access to all removable panels may not be required, installer should take care to comply with all building codes and allow adequate clearance for future field service. 2. Water inlet and water outlet connections are factory shipped on the left side. Union allows field conversion to right side. 3. Condensate drain is available on either side (left or right) of unit. Drain hose and drain connection will be tied inside the unit. Installer will until the drain hose, form trap, and connect to the condensate drain hole of installer's choice.

4. Electrical access is available on either side (left or right) of unit and is also available in the front on the left or right side of the unit.



NRF

3



REAR RETURN FRONT DISCHARGE (RR/FD)

FRONT RETURN REAR DISCHARGE (FR/RD)

4 a5

		Ove	erall Cat	oinet	Dischar Dເ	ge Conn Ict Flang	ection e	Water Connections			Electric Knockouts					Return Air Connections Using Return Air Opening				
Mode	1	Α	В	С	D	Е	F	K	L	М	N	01	02	Р	Q	R	S	Т	U	٧
inouc	Woder							1	2	3										
					Supply	Supply		Water	Water	Con-							Return	Return		
		Depth	Width	Height	Width	Depth		Inlet	Outlet	densate							Depth	Height		
072-120	cm.	73.7	104.1	177.2	44.5	37.5	30.2	55.9	18.4	36.8	54.0	20.3	38.1	28.6	2.5	3.8	91.4	93.3	77.8	6.9

TCV160-240 Dimensional Data



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66.3

29 3

79

36.8

160-240 cm.

73.7

208.3 177.2

37.5

45.4

44.5

90.8

80.5 6.7

195.6

20.3 38.1 28.6 2.5 3.8

TCV300 Dimensional Data



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Water

Inlet

26.1

Water

Outlet

7.9

Supply

Depth

21.8

Supply

Width

16.0

Supply

Width

44.5

Supply

Depth

37.5

Con

densate

36.8

Model

Width

300 cm. 73.7 208.3 177.2

Depth Height

Return

Height

90.9 80.5 6.7

Return

Depth

20.3 38.1 28.6 2.5 3.8 195.6

TC Electrical Data Standard

TC Electrical Data - Standard

						Compres	sor		Trial			
Model	Voltage Code	Voltage	Min/Max Voltage	Blower Option	QTY	RLA	LRA	Fan Motor FLA	Unit FLA	Circuit Amp	Max Fuse/ HACR	
TCH/V072	U	380/420/50/3	360/440	A, B, C	2	5.4	38.0	1.8	12.6	14.0	15	
TCH/V096	U	380/420/50/3	360/440	A, B, C	2	6.1	43.0	3.4	15.6	17.1	20	
TCH/V120	U	380/420/50/3	360/440	A, B, C	2	7.8	51.5	4.9	20.5	22.5	30	
TCV160	U	380/420/50/3	360/440	A, B, C	2	11.2	75.0	4.9	27.3	30.1	40	
TCV192	U	380/420/50/3	360/440	A, B, C	2	12.2	101.0	4.9	29.3	32.4	40	
TCV240	U	380/420/50/3	360/440	A, B, C	2	16.7	111.0	7.8	41.2	45.4	60	
TCV300	U	380/420/50/3	360/440	A, B, C	2	18.6	118.0	21.0	58.2	62.9	80	

All fuses Class RK-5

TC Electrical Data - Dual Point Power

						С	ompres		Emergency Power Supply				
Model	Voltage Code	Voltage	Min/Max Voltage	Blower Option	Blower Option QTY		LRA	Total Comp FLA	Comp MCA	Comp Max Fuse/ HACR	Fan Motor FLA	Fan MCA	Fan Max Fuse/ HACR
TCH/V072	U	380/420/50/3	360/440	A, B, C	2	5.4	38.0	10.8	12.2	15	1.8	2.2	15
TCH/V096	U	380/420/50/3	360/440	A, B, C	2	6.1	43.0	12.2	13.7	15	3.4	4.3	15
TCH/V120	U	380/420/50/3	360/440	A, B, C	2	7.8	51.5	15.6	17.6	25	4.9	6.1	15
TCV160	U	380/420/50/3	360/440	A, B, C	2	11.2	75.0	22.4	25.2	35	4.9	6.1	15
TCV192	U	380/420/50/3	360/440	A, B, C	2	12.2	101.0	24.4	27.4	35	4.9	6.1	15
TCV240	U	380/420/50/3	360/440	A, B, C	2	16.7	111.0	33.4	37.6	50	7.8	9.8	15
TCV300	U	380/420/50/3	360/440	A, B, C	2	18.6	118.0	37.2	41.9	60	21.0	26.3	15

TCH/V Series Wiring Diagram Matrix

Lood Unit Controller	Voltage
Lead Onit Controller	380-420/50/3
CXM2	96B0127N54
DXM2.5	96B0127N55
Auxiliary WD for MPC Controls	96B0149N11

All wiring diagrams available at climatemaster.com.

Tranquility[®] Compact (TCH/V) Belt Drive Series 50Hz Engineering Specifications - Page 1

General:

Furnish and install ClimateMaster Tranquility[®] "Large Horizontal and Vertical" Water Source Heat Pumps, as indicated on the plans. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow.

Units shall be supplied completely factory built capable of operating over an entering water temperature range from -5° to 45°C as standard. Equivalent units from other manufacturers may be proposed provided approval to bid is given 10 days prior to bid closing. All equipment listed in this section must be rated in accordance with International Standards Organization (ISO) 13256-1 and EN14511-2. The units shall have CE labels.

All units shall pass a factory acceptance test. The quality control system shall automatically perform the factory acceptance test via computer. A detailed report card from the factory acceptance test shall ship with each unit. Note: If unit fails the factory acceptance test it shall not be allowed to ship. Unit serial number will be recorded by factory acceptance test and furnished on report card for ease of unit warranty status.

Basic Construction:

Horizontal units shall have one of the following air flow arrangements: Left Return/Back Discharge, Left Return/ Straight Discharge, Right Return/Back Discharge, Right Return/Straight Discharge as shown on the plans. Units can be field converted without requiring new panels or belts. **Units that cannot be field converted shall not be acceptable.**

Vertical units shall have one of the following air flow arrangements: Rear Return/Top Discharge, Front Return/ Top Discharge, Rear Return/Front Discharge, Front Return/Rear Discharge as shown on plans. **Units that cannot be field converted shall not be acceptable.**

If units with these arrangements are not used, the contractor is responsible for any extra costs incurred by other trades. All units must have a minimum of two access panels for serviceability of compressor compartment. **Units having only one access panel to compressor/heat exchangers/expansion device/refrigerant piping shall not be acceptable.**

Compressor section interior surfaces shall be lined with 12.7mm thick, 24 kg/m3 acoustic type glass fiber insulation. Air handling section interior surfaces shall be lined with 12.7mm thick, 28 kg/m3 foil backed fiber insulation for ease of cleaning. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the air stream. **Units without foil faced insulation in the air handling section will not be accepted.**

Horizontal heat pumps shall be fabricated from heavy gauge galvanized steel with powder coat finish on front panels.

Standard insulation must meet NFPA Fire Hazard Classification requirements 25/50 per ASTM E84, UL 723, CAN/ULC S102-M88 and NFPA 90A requirements; air erosion and mold growth limits of UL-181; stringent fungal resistance test per ASTM-C1071 and ASTM G21; and shall meet zero level bacteria growth per ASTM G22. **Unit insulation must meet these stringent requirements or unit(s) will not be accepted.**

Horizontal units to have discharge air duct collar and factory installed mounting brackets. Vertical units to have discharge air duct collar. If units with these factory installed provisions are not used, the contractor is responsible for any extra costs to field install these provisions, and/or the extra costs for his sub-contractor to install these provisions.

All units must have an insulated panel separating the fan compartment from the compressor compartment. Units with the compressor in the air stream are not acceptable. Horizontal units shall have a factory installed 25.4mm or 50.8 mm wide filter rails with filter removal from either side.

Vertical units shall have factory-installed 25.4 mm, 50.8mm, or 101.6mm wide full filter frame. Units shall have throwaway type glass fiber filters installed. **If units with these factory installed provisions are not used, the contractor is responsible for any extra costs to field install these provisions, and/or the extra costs for his sub-contractor to install these provisions.** The contractor shall purchase one spare set of filters and replace factory shipped filters on completion of start-up. Filters shall be standard sizes. If units utilize non-standard filter sizes then the contractor shall provide 12 spare filters for each unit.

Tranquility[®] Compact (TCH/V) Belt Drive Series 50Hz Engineering Specifications - Page 2

Cabinets shall have separate knockouts on front and sides for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. Supply and return water connections shall be copper FPT fittings, connections on both sides (installer to choose side and plug opposite) and shall be securely mounted flush to the cabinet side allowing for connection of a flexible hose without the use of a back-up wrench. Water connections that protrude through the cabinet or require the use of a backup wrench shall not be allowed. Water connections on only one side will not be accepted. All water connections and electrical knockouts must not interfere with the serviceability of unit. Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.

Units shall have an Ingress Protection Rating of IP25

Option: Dual-point power.

Option: UltraQuiet package shall consist of high technology sound attenuating material that is strategically applied to the compressor and air handling compartment casings and fan scroll in addition to the standard ClimaQuiet system design, to further dampen and attenuate sound transmissions. Compressor is mounted on specially engineered sound-tested isolators.

Fan and Motor Assembly:

All units shall have belt-driven single centrifugal fan. Fan motor shall be permanently lubricated with thermal overload protection. Units supplied without permanently lubricated motors must provide external oilers for easy service. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule. Airflow/Static pressure rating of the unit shall be based on a wet coil and a clean filter in place. **Ratings based on a dry coil and/or no filter, or on an ESP less than 6.35 mm w.g. shall NOT be acceptable.**

Option: Various blower drive packages for selectable static pressure/airflow.

Refrigerant Circuit:

All units shall contain an EarthPure[®] (HFC-410A) sealed refrigerant circuit including a high efficiency scroll compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant to air heat exchanger, reversing valve, coaxial (tube in tube) refrigerant to water heat exchanger, and safety controls including a high pressure switch, low pressure switch (loss of charge), water coil low temperature sensor, and air coil low temperature sensor. Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit. The lockout circuit shall be reset at the thermostat or at the contractor supplied disconnect switch. **Units that cannot be reset at the thermostat shall not be acceptable.**

Hermetic compressors shall be internally sprung. The scroll compressors shall have a dual level vibration isolation system. The compressor(s) will be mounted on specially engineered sound-tested EPDM vibration isolation grommets to a large heavy gauge compressor mounting plate, which is then isolated from the cabinet base with rubber grommets for maximized vibration attenuation. Compressor shall have thermal overload protection. Compressor shall be located in an insulated compartment isolated from air stream to minimize sound transmission.

Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 4309 kPa refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 4309 kPa working refrigerant pressure and 3445 kPa working water pressure. The refrigerant to water heat exchanger shall be "electro-coated" with a low cure cathodic epoxy material a minimum of 0.4 mils thick (0.4 – 1.5 mils range) on all surfaces. The black colored coating shall provide a minimum of 1000 hours salt spray protection per ASTM B117-97 on all external steel and copper tubing. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 184 kg-cm direct (ASTM D2794-93).

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced type with external equalizer for optimum refrigerant metering. Units shall be designed and

Tranquility[®] Compact (TCH/V) Belt Drive Series 50Hz Engineering Specifications - Page 3

tested for operating ranges of entering water temperatures from -5° to 45°C. Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low temperature thermostat must be provided to prevent over-cooling an already cold room.

Option: The unit shall be supplied with cupro-nickel coaxial water to refrigerant heat exchanger.

Option: The unit shall be supplied with extended range Insulation option, which adds closed cell insulation to internal water lines, and provides insulation on suction side refrigeration tubing including refrigerant to water heat exchanger.

Option: The refrigerant to air heat exchanger shall be coated.

Drain Pan:

The drain pan shall be constructed of galvanized steel and have a powder coat paint application to further inhibit corrosion. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117. If plastic type material is used, it must be HDPE (High Density Polyethylene) to avoid thermal cycling shock stress failure over the lifetime of the unit. Drain pan shall be fully insulated. Drain outlet shall be located at pan as to allow complete and unobstructed drainage of condensate. Drain pan hose assembly can be connected to either side, drain outlet to be 1"FPT fitting. **Choice of drain connection to only one side will not be accepted.** The unit as standard will be supplied with solid-state electronic condensate overflow protection. Mechanical float switches will NOT be accepted.

Option: The unit shall be supplied with stainless steel drain pan.

Electrical:

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer with load side circuit breaker protection, 24 volt activated, 2 or 3 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Reversing valve and fan motor wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 Volt and provide heating or cooling as required by the remote thermostat/sensor. Two compressor units shall have a solid-state time delay relay and random start to prevent both compressors from starting simultaneously.

Enhanced Solid State Control System (CXM2):

Units shall have a solid-state control system. Units utilizing electro-mechanical control shall not be acceptable. The control system microprocessor board shall be specifically designed to protect against building electrical system noise contamination, EMI, and RFI interference. The control system shall interface with a heat pump type thermostat. The control system shall have the following features:

- a. Anti-short cycle time delay on compressor operation.
- b. Random start on power up mode.
- c. Low voltage protection.
- d. High voltage protection.
- e. Unit shutdown on high or low refrigerant pressures.
- f. Unit shutdown on low water temperature.
- g. Condensate overflow electronic protection.
- h. Option to reset unit at thermostat or disconnect.
- i. Automatic intelligent reset. Unit shall automatically reset the unit 5 minutes after trip if the fault has cleared. If a fault occurs 3 times sequentially without thermostat meeting temperature, then lockout requiring manual reset will occur.
- j. Ability to defeat time delays for servicing.
- k. The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
- I. 24V output to cycle a motorized water valve or other device with compressor contactor.
- m. Unit Performance Sentinel (UPS). The UPS warns when the heat pump is running inefficiently.
- n. Water coil low temperature sensing (selectable for water or anti-freeze).

Tranquility[®] Compact (TCH/V) Belt Drive Series 50Hz Engineering Specifications - Page 4

- o. Air coil low temperature sensing.
- p. Minimized reversing valve operation (Unit control logic shall only switch the reversing valve when cooling is demanded for the first time. The reversing valve shall be held in this position until the first call for heating, ensuring quiet operation and increased valve life).
- q. Emergency shutdown contacts.
- r. Entering and leaving water temperature sensing.
- s. Leaving air temperature sensing.
- t. Compressor discharge temperature sensing.

NOTE: Units not providing the 8 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil low temperature cut-out, water coil low temperature cut-out, and condensate overflow protections will not be accepted.

When CXM2 is connected to AWC99U01 thermostat or handheld service tool, the installer/service technician can; check DIP switch S2 settings; run operation modes manually; check all physical inputs from thermostat and refrigerant pressure switches status, (Y1, Y2, W, O, G, H, ESD, NSB, OR, HP switch, and LOC switch); current or at time of fault the following temperatures - water coil (LT1), air coil (LT2), compressor discharge, leaving air, leaving water, entering water and control voltage; record last five faults, list possible reasons, and clear faults. When the AWC99U01 communicating thermostat is used this same functionality can be viewed and adjusted remotely in the web portal or mobile app. **Systems not providing remote access, diagnosis, and adjustment functionality will not be accepted.**

Option: Enhanced Solid State Control System (DXM2.5)

This control system is a communicating controller.

Control shall have the above-mentioned features of the CXM2 control system along with the following expanded features:

- a. Removable thermostat connector.
- b. Night setback control.
- c. Random start on return from night setback.
- d. Override temperature control with 2-hour timer for room occupant to override setback temperature at the thermostat.
- e. Dry contact night setback output for digital night setback thermostats.
- f. Ability to work with heat pump or heat/cool (Y, W) type thermostats.
- g. Ability to work with heat pump thermostats using O or B reversing valve control.
- h. Boilerless system heat control at low loop water temperature.
- i. Ability to allow up to 3 units to be controlled by one thermostat.
- j. Relay to operate an external damper.
- k. Relay to start system pump.
- 75 VA control transformer. Control transformer shall have load side short circuit and overload protection via a built-in circuit breaker.

NOTE: Units not providing the 8 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil low temperature cut-out, water coil low temperature cut-out, and condensate overflow protection for both drain pans will not be accepted.

When DXM2.5 is connected to AWC99U01 communicating thermostat or handheld service tool, the installer/service technician can; check and set CFM; check DIP switch S1, S2, and S3 settings; run operation modes manually; check all physical inputs from thermostat and refrigerant pressure switches status, (Y1, Y2, W, O, G, H, ESD, NSB, OR, HP switch, and LOC switch); current or at time of fault the following temperatures - water coil (LT1), air coil (LT2), compressor discharge, leaving air, leaving water, entering water and control voltage; record last five faults, list possible reasons, and clear faults. When the AWC99U01 communicating thermostat is used this same functionality can be viewed and adjusted remotely with the only portal or mobile app. **Systems not providing remote access, diagnosis, and adjustment functionality will not be accepted.**

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Tranquility[®] Compact (TCH/V) Belt Drive Series 50Hz Engineering Specifications - Page 5

Remote Service Sentinel (CXM2/DXM2.5):

Solid state control system shall communicate with applicable thermostats to display (at the thermostat) the unit status, fault status, and specific fault condition, as well as retrieve previously stored fault that caused unit shutdown. The Remote Service Sentinel allows building maintenance personnel or service personnel to diagnose unit from the wall thermostat. The control board shall provide a signal to the thermostat, indicating a lockout. A detailed message shall be provided at the communicating thermostat or service tool and specific fault status such as over/under voltage fault, high pressure fault, low pressure fault, low water temperature fault, condensate overflow fault, etc. **Units that do not provide this remote service sentinel shall not be acceptable.**

Option: MPC (Multiple Protocol Control) interface system

Units shall have all the features listed above (either CXM2 or DXM2.5) and the control board will be supplied with a Multiple Protocol interface board. Available protocols are BACnet MS/TP, Modbus, or Johnson Controls N2. The choice of protocol shall be field selectable/changeable via the use of a simple selector switch. Protocol selection shall not require any additional programming or special external hardware or software tools. This will permit all units to be daisy chain connected by a 2-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

- a. Space temperature
- b. Leaving water temperature
- c. Discharge air temperature
- d. Command of space temperature setpoint
- e. Cooling status
- f. Heating status
- g. Low temperature sensor alarm
- h. Low pressure sensor alarm
- i. High pressure switch alarm
- j. Condensate overflow alarm
- k. Hi/low voltage alarm
- I. Fan "ON/AUTO" position of space thermostat as specified above
- m. Unoccupied/occupied command
- n. Cooling command
- o. Heating command
- p. Fan "ON/AUTO" command
- q. Fault reset command
- r. Itemized fault code revealing reason for specific shutdown fault (any one of 7)

This option also provides the upgraded 75VA control transformer with load side short circuit and overload protection via a built in circuit breaker.

Warranty:

Climate Master shall warranty equipment for a period of 12 months from start up or 18 months from shipment (whichever occurs first).

Option: Extended 4-year compressor warranty covers compressor for a total of 5 years.

Option: Two-Year Extended Warranty provides coverage for a period of 24 months from the date of start-up or 30 months from date of shipment (whichever occurs first).

FIELD INSTALLED OPTIONS

Hose Kits:

All units 35 kW and below shall be connected with hoses. The hoses shall be 61cm long, braided stainless steel; fire rated hoses complete with adapters. Only fire rated hoses will be accepted.

Tranquility[®] Compact (TCH/V) Belt Drive Series 50Hz Engineering Specifications - Page 6

Valves:

The following valves are available and will be shipped loose:

- a. Ball valve; bronze material, standard port full flow design, FPT connections.
- b. Ball valve with memory stop and PT port.
- c. "Y" strainer with blowdown valve; bronze material, FPT connections.
- d. Motorized water valve; slow acting, 24v, FPT connections.

Hose Kit Assemblies:

The following assemblies ship with the valves already assembled to the hose described:

- a. Supply and return hoses having ball valve with PT port.
- b. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve with PT ports, and ball valve.
- c. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having automatic flow regulator with PT ports, and ball valve.
- d. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having ball valve with PT port.

Thermostats:

The thermostat shall be a ClimateMaster mechanical or electronic type thermostat as selected below with the described features:

a. Thermostat (Communicating) (AWC99U01)

An electronic communicating web-enabled touchscreen thermostat shall be provided. The thermostat shall offer three stages of heating and two stages of cooling with precise temperature control and have a four-wire connection to the unit. The thermostat shall be capable of manual or automatic change-over operation and shall operate in standard or programmable mode. An integrated humidity control feature shall be included to control a humidifier and/or a dehumidifier. The thermostat shall include a utility demand reduction feature to be initiated by an independent time program or an external input.

The thermostat shall provide access to via the web portal or mobile application to include temperature adjustment, schedule adjustment including occupied/unoccupied, entering water temperature, leaving water temperature, water coil temperature, air coil temperature, leaving air temperature, and compressor discharge temperature. A graphical system layout to be provided with real-time operating mode information of the temperature sensors for easy diagnostics.

The thermostat shall display system faults with probable cause and troubleshooting guidance. The system shall provide in clear language last five faults, time of faults, operating temps at time of fault, and possible reasons for the fault. The thermostat shall provide access for immediate manual control of all outputs via the web portal/mobile application for rapid troubleshooting.

b. Single-Stage Digital Auto or Manual Changeover (ATA11U01)

Thermostat shall be a single-stage, digital, auto or manual changeover with HEAT-OFF-COOL-AUTO system switch and fan ON-AUTO switch. Thermostat shall have an LCD display with temperature and setpoint(s) in °F or °C. The Thermostat shall provide permanent memory of setpoint(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall provide temperature display offset for custom applications.

c. Multi-stage Manual Changeover Programmable 5/2 Day (ATP21W02)

Thermostat shall be 5 day/2 day programmable (with up to 4 setpoints per day), multi-stage (2H/1C), manual changeover with HEAT-OFF-COOL-EM HEAT system settings and fan ON-AUTO settings. Thermostat shall have an LCD display with temperature, setpoint(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of setpoint(s) without batteries. Thermostat shall provide convenient override feature to temporarily change setpoint.

d. Multi-stage Automatic or Manual Changeover Programmable 7 Day (ATP32U03C)

Thermostat shall be 7 day programmable (with up to 4 setpoints per day), multi-stage (3H/2C), automatic or manual

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changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Thermostat shall have a blue backlit dot matrix LCD display with temperature, setpoints, mode, and status indication. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12 or 24 hour clock. Fault identification shall be provided (when used with ClimateMaster CXM2 or DXM2.5 controls) to simplify troubleshooting by providing specific unit fault at the thermostat with red backlit LCD during unit lockout. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating setpoint range limit, cooling setpoint range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring options and for setup of servicing contractor name and contact information. Thermostat shall allow the use of an accessory remote and/or outdoor temperature sensor (AST008). Thermostat navigation shall be accomplished via five buttons (up/down/right/left/select) with menu-driven selections for ease of use and programming.

e. Multistage Automatic or Manual Changeover Programmable 7 Day with Humidity Control (ATP32U04C)

Thermostat shall be 7 day programmable (with up to 4 setpoints per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Separate dehumidification and humidification setpoints shall be configurable for discreet outputs to a dehumidification option and/ or an external humidifier. Installer configuration mode shall allow thermostat dehumidification mode to operate with ClimaDry® II reheat or with ECM fan dehumidification mode via settings changes. Thermostat shall have a blue backlit dot matrix LCD display with temperature, relative humidity, setpoints, mode, and status indication. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12 or 24 hour clock. Fault identification shall be provided (when used with ClimateMaster CXM2 or DXM2.5 controls) to simplify troubleshooting by providing specific unit fault at the thermostat with red backlit LCD during unit lockout. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating setpoint range limit, cooling setpoint range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring options and for setup of servicing contractor name and contact information. Thermostat shall allow the use of an accessory remote and/or outdoor temperature sensor (AST008). Thermostat navigation shall be accomplished via five buttons (up/down/right/left/select) with menu-driven selections for ease of use and programming.

f. CM100 - Multi-stage Automatic or Manual Changeover digital thermostat (ATA32V01)

Multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Thermostat shall have a green backlit LED display with temperature, setpoints, mode, and status indication via a green (cooling) or red(heating) LED. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12 or 24 hour clock. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating setpoint range limit, cooling setpoint range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring. Thermostat navigation shall be accomplished via four buttons (Mode/fan/down/up) with menu-driven selections for ease of use and programming.

g. CM300 – Multi-stage, Automatic or Manual Changeover, 7-day Programmable with Wi-Fi and Humidity Control (AVB32V02C)

Residential version shall be 7 day programmable with up to 4 setpoints per day. Commercial version shall be 7 day programmable with 4 occupied/unoccupied periods per day with up to 4-hour override. Multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings, Wi-Fi, preoccupancy purge fan option, night time control of display backlight, bi-color LED indicates a heating or cooling demand, keypad lock, title 24 compliant, openADR2.0b certified with Skyport web portal. Compatible with condensate overflow warning systems – lockout compressor with message on.

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h. CM500 – Color Touchscreen Display, Multi-stage, Automatic or Manual Changeover, 7-day Programmable with Wi-Fi and Humidity Control (AVB32V03C)

Thermostat shall have color resistive touchscreen display with space temperature, relative humidity, setpoints, mode, status indication and local weather (if connected to Wi-Fi). Residential version shall be 7 day programmable with up to 4 setpoints per day. Commercial version shall be 7 day programmable with 4 occupied/unoccupied periods per day with up to 4-hour override. Multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings, Wi-Fi, pre-occupancy purge fan option, customizable screen saver and background displays, indicator on display indicates a heating or cooling demand, set-point lock, title 24 compliant, openADR2.0b certified with Skyport web portal. Compatible with condensate overflow warning systems - lockout compressor with message on the display. Capable of being monitored by 3rd party software. Compatible with AST014 Wi-Fi remote sensor. Configurator mobile app or web portal for easy setup. Separate dehumidification and humidification setpoints shall be configurable for discreet outputs to a dehumidification option and/or an external humidifier. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12- or 24-hour clock. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating setpoint range limit, cooling setpoint range limit, temperature display offset, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide access to a web portal and mobile app for installer setup for configuring options. Thermostat shall have menu-driven selections for ease of use and programming.

DDC Sensors:

ClimateMaster wall mounted DDC sensor to monitor room temperature and interfaces with optional interface system described above. Several types as described below:

- a. Sensor only with no display.
- b. Sensor with setpoint adjustment and override.
- c. Sensor with setpoint adjustment and override, LCD display, status/fault indication.

Revision History

Date:	Item:	Action:
01/24/23	All	Transitioned from CXM to CXM2 and DXM2 to DXM2.5 unit controls. Introduced Wi-Fi cloud connected color touch screen communicating thermostat
4/25/18	All	Add SEER and SCOP, misc. edits
04/08/16	Engineering Specifications	Update run test text
08/14/15	Engineering Specifications	Removed AHRI Text
07/20/15	Wiring Diagram Matrix	Updated
04/01/15	Pages 4, 23, 25, 29 W/D's	Misc Edits
12/03/12	TCV072-120 Dimensional Data	Updated
	Engineering Specifications	
08/30/12	Performance Data Table	Updated Notes
07/13/12	All Pages	Added TCV sizes 160-300
06/26/12	Performance Data Table	Updated Sizes 096 and 120 Tables
08/09/11	Unit Maximum Working Water Pressure	Updated to Reflect New Safeties
08/16/10	Created	