



Self Contained Water Cooled Air Conditioners

**MODEL :WCVS
160 - 1200 MBH
6000 - 33000 CFM
50 Hz**



WCVS-PRC001-EN

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WCVS Model Nomenclature

W C V S 2 7 0 D 1 C X I A 0 A
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Digit 1,2,3 **W C V** Water Cooled / Self Contained / Vertical

Digit 4 **S** Development Sequence

Digit 5,6,7 **2 7 0** Model Number [270 - 12H]

Digit 8 **D** Electrical Rating / Utilization Range
 D = 380 - 415V / 3Phase / 50 Hz

Digit 9 **1** Factory Mounted Control
 1 = DOL Starter with Unitary Controller, UC2C / UC4C
 2 = Soft Starter with Unitary Controller, UC2C / UC4C

Digit 10 **C** Minor Design Sequence
 C = Double Wall PU Panels - Standard on all models & Introduction of FUJI Starter

Digit 11 **X** Factory Installed Options
 X = None

Digit 12 **I** Installed Motor kW

Digit 13 **A** Refrigerant Type
 A = R22
 B = R407C

Digit 14 **0** Future Use

Digit 15 **A** Service Indicator

WCVS MODELS	STD. MTR, kW	O/Size MTR, kW
WCVS 270	I = 3.7	K = 5.5
WCVS 330	I = 3.7	L = 7.5
WCVS 400 / 470 / 530	K = 5.5	M = 11
WCVS 600 / 660	L = 7.5	N = 15
WCVS 730 / 800	M = 11	N = 15
WCVS 900	N = 15	O = 18.5
WCVS 12H	P = 22	NA



WCVS Features and Benefits

Intelligent Control

7 Segment LED Indicated Microprocessor Diagnostics.	Quicker, Accurate Troubleshooting.
Higher Controller Reliability with built in control & safety logic.	Longer, trouble-free life span.
Less Complex, fewer electromechanical parts.	Increases Reliability with built in safeties.
Built in temperature control with zone sensor, and adjustable zone setpoint. [applicable for zone control only]	Accurate control. Eliminates field sourcing, purchasing & Installation downtime.
Fully tested: coils, system leak tests and full run tests.	Guarantees units leave the factory fully charged, tested, and in operational order.
Remote signalling of general faults.	Added ease in troubleshooting & diagnostics remotely for each unit.

Full Protection

Compressor overheat, overcurrent protection shall be provided.
High and low pressure safety switches to protect the system against operations outside recommended pressure limits.
Reverse rotation protection on compressors through safeties that trip the system on high temperature.
Compressor time delays and on-off sequencing logic that is built into the microprocessor algorithm for maximum protection.
Micro Processor controlled sequencing to prevent frequent start stops.
Double walled PU panels and Non hydroscopic PE Insuated frames to ensure clean, quiet and safe air always.



Intelligent Design

Small Footprints	Reduces valuable installed space
Multi Scroll Compressors:	Improved reliability with less moving parts. Quieter, low starting torque.
High Efficiency Evaporator Coils	High Carryover tolerance and higher coil efficiencies, with Trane Slit Fin Technology.
Multiple Refrigerant Circuits (WCVS 470-800, 900, 12H)	Redundancy.
Optimized Part load efficiencies.	Delivers higher efficiencies at part load.

Simplified Installation & Servicing

Service Flexibility	For 2 circuit systems, this means servicing capability without total refrigerant system shutdown.
Built in 1" Washable Filters [2" washable on the 900, 12H]	Filters come installed in AI frames, allowing, cost effective and quick filter replacements.
Built in controls" Starters, thermostats	Minimum electrical wiring and costs required.
Fully R22 Charged.	Almost a plug and play product.
Colored & Numbered Wiring.	Further enhances installation & troubleshooting for peace of mind.
Cleanable High efficiency shell & tube condensers (excludes models 900, 12H)	Quick, easy and lower frequency tube maintenance. [900, 12H models have independent tube in tube condensers]
Interchangeable water connection sides	Allows for piping flexibility.
High Static Options	Allows for a wide airflow application range.

System Performance Matrix

Model	Total MBH	Capacity kW	Sensible MBH	kW	Capacity CFM	Nominal Airflow CMS	Condenser		Total R407C MBH	Capacity kW
							USGPM	l/s		
WCVS270	214	63	150	44	6190	2.92	48	3.0	203	59
WCVS330	278	81	189	55	7760	3.66	63	4.0	264	76
WCVS400	323	95	221	65	9240	4.36	74	4.7	307	90
WCVS470	400	117	281	82	10750	5.07	91	5.7	380	111
WCVS530	431	126	294	86	12120	5.72	99	6.2	409	119
WCVS600	537	157	383	112	13800	6.51	120	7.6	510	149
WCVS660	591	173	406	119	15130	7.14	131	8.3	561	164
WCVS730	650	190	474	139	16880	7.97	147	9.3	617	180
WCVS800	682	200	487	143	18080	8.53	156	9.8	645	190
WCVS900	855	251	600	176	24500	11.56	208	13.1	812	238
WCVS12H	1140	333	798	233	33500	15.81	277	17.5	1083	316

Gross Cooling Capacity based on 85/95 deg F [29.5-35 C], EWT-LWT and 80/67 deg F [27/19C] on coil conditions & Nominal airflows

Standard Unit Description

Testing

Standard units are factory assembled and tested as described below.

	WCVS	WCVS	WCVS	WCVS	WCVS		WCVS	WCVS	WCVS	WCVS	WCVS
	270	330-400	470-530	600-800	900-12H		270	330-400	470-530	600-800	900-12H
General						Condenser Section					
Factory run tested.	X	X	X	X	X	Cleanable shell & tube.	X	X	X	X	
Refrigerant R22 Operating charge. [R407 C option]	X	X	X	X	X	300 PSIG waterside max. operating press.	X	X	X	X	X
Full oil operating charge.	X	X	X	X	X	Multiple independent tube in tube					X
50mm (2") washable filters.	X	X	X	X	X	Evaporator Section					
Colored/numberer wiring	X	X	X	X	X	TEFC motors	X	X	X	X	X
Right side water connection. (Interchangeable)	X	X	X	X	X	Vertical discharge.	X	X	X	X	X
Back-to-wall installation. Left side water connection at site	X	X	X	X	X	Forward curved fans.	X	X	X	X	X
Compressors						Front entering return air.	X	X			
Hermetic scrolls	X	X	X	X	X	Rear entering return air.			X	X	X
Internal motor thermostat.	X	X	X	X	X	Fixed pitch sheaves.	X	X	X	X	X
Electronic current overload.	X	X	X	X	X	PE non hyrosclapic termal insulation. (Frame)	X	X	X	X	X
Internal pressure relief.	X	X	X	X	X	Center sloping, insulated and corrosion treated drain pan.	X	X	X	X	X
Refrigerant Circuit						Double skin 25mm PU (Panels)	X	X	X	X	X
2 refrigerant circuits.			X	X	3-4	Return air thermostat	X	X	X	X	X
High pressure cutout	X	X	X	X	X	Factory mounted Options					
Low pressure cutout	X	X	X	X	X	Factory mounted DOL starters.	X	X	X	X	X
Suction line gauge access port.	X	X	X	X	X	Oversize fan motor & drive	X	X	X	X	X
Discharge line gauge access port.	X	X	X	X	X						
Liquid line sight glass.	X	X	X	X	X						
Thermal expansion valve	X	X	X	X	X						
Filter drier	X	X	X	X	X						
Insulated suction line.	X	X	X	X	X						
Base panel.	X	X	X	X	X						



General Specifications

WCVS 270 - 12H

	WCVS 270	WCVS 330	WCVS 400	WCVS 470	WCVS 530	WCVS 600	WCVS 660	WCVS 730	WCVS 800	WCVS 900	WCVS 12H	
Performances (1)												
Unit Capacity Steps (%)	50-50	50-50	50-50	27-63-100	25-62-100	21-50-70-100	25-50-75-100	23-50-73-100	25-50-75-100	35-66-100	25-50-75-100	
Total Compressor Power Input (kW)	13.2	18.3	22.3	25.5	29.2	32.1	33.9	41.2	45.2	57.0	77.0	
Main Power Supply	400/3/50											
Utilization Range	400V+/- 10%											
Sound Power Level (at 1kHz) (dBA)	70	68	73	72	72	72	71	73	76	76	76	
Compressor Data												
Number	2	2	2	3	3	4	4	4	4	3	4	
Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	
Model	2x10T	2x13T	2x15T	(1x10T) + (2x13T)	(1x10T) + (2x15T)	(2x10T) + (2x13T)	2 x (2x13T)	(2x13T) + (2x15T)	2 x (15T + 15T)	3x25T	4x25T	
Speeds Number	Single Speed, 2900RPM @ 50Hz											
Unit MCA Amps (2) (4) (A)	Refer to Electrical Data Table											
RLA / LRA (2) (4) (A)	Refer to Electrical Data Table											
Condenser Data												
Condenser Type	SIMPLEX-Shell & Tube Condenser (25RT)			DUPLEX - Shell & Tube Condenser, 35RT		DUPLEX-Shell & Tube Condenser, 50RT				MANIFOLDED - Tube in Tube Cds.		
Water Connection Size	in, BSPT (Int Thd) 2.5" BSPT			2.5 2.5		2.5 2.5		2.5 2.5		4 4		
Max. Flow Rate	gpm/Lpm	60/228	73/276	89/335	102/386	116/438	132/500	144/546	161/609	172/648	265/1003	338/1279
Min Flow Rate	gpm/Lpm	26/98	33/145	40/150	46/174	53/198	58/219	66/252	72/273	79/300	165/625	178/674
Max. Water Side Pressure	psig/Kpa	300/2068	300/2068	300/2068	300/2068	300/2068	300/2068	300/2068	300/2068	300/2068	300/2068	300/2068
Evaporator Coil Data												
Configuration	Rows/FPI	3/12	3/12	3/12	3/12	3/12	4/12	4/12	4/12	4/12	4/12	4/12
Face Area	Sq.ft/m ²	13.4/1.25	16.7/1.55	19.2/1.78	26.2/2.44	26.2/2.44	34.8/3.24	34.8/3.24	38/3.53	38/3.53	50/4.65	66/6.13
Tube Material		Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper	Copper
Tube Type		Smooth Bore										
Tube Size (OD)	in/mm	3/8 / 9.5	3/8 / 9.5	3/8 / 9.5	3/8 / 9.5	3/8 / 9.5	0.5 / 12.7	0.5 / 12.7	0.5 / 12.7	0.5 / 12.7	0.5 / 12.7	0.5 / 12.7
No. Of Circuits (Coil)		1	1	1	2	2	2	2	2	2	3	4
Refrigerant Flow Control		TXV										
Drain Connection Size	in, BSPT	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4
Evaporator Fan/Motor Data												
Drive Type		Belt										
FLA/LRA (each) (2)		Refer to Electrical Data Table										
No of Motors	Std. HP/kW	5/3.7	5/3.7	7.5/5.5	7.5/5.5	7.5/5.5	10/7.5	10/7.5	15/11	15/11	20/15	30/22
	Hi Static HP/kW	7.5/5.5	10/7.5	15/11	15/11	15/11	20/15	20/15	20/15	20/15	25/18.5	-
Diameter of Fan	in/mm	15.4/390	15.7/400	15.7/400	15.4/390	15.4/390	17.7/450	17.7/450	17.7/450	17.7/450	19.7/500	22/560
No of Fans		1	1	1	2	2	2	2	2	2	2	2
Indoor Fan Type		Centrifugal FC										
Air Qty. - Max	cfm	7600	9600	11300	14600	14600	18300	18300	21900	21900	28000	38000
- Min	cfm	4800	6200	7400	9600	9600	12000	12000	14400	14400	21000	28000
Fan Motor Type		TEFC 400V+, -10%/3Ph/50Hz										
Std. Fan Speed (Std. Factory Set)		900	850	900	900	900	760	760	760	760	786	698
@ ESP including filters in / (Nominal CFM)		1.1*[6190]	1.1*[7760]	1*[9240]	1.0*[10750]	0.9*[12120]	1.4*[13800]	1.5*[15130]	1.3*[16880]	1.1*[18080]	1.2*[24750]	1.2*[33000]
Max. Allowable Fan RPM		1100	1100	1100	1200	1200	1000	1000	1000	1000	1000	1000
Filters (3)												
		2" WASHABLE										
Size	(Qty) in	(2) 15x20x2	(4) 20x20x2	(4) 20x25x2	(6) 15x25x2	(6) 15x25x2	(9) 20x25x2	(9) 20x25x2	(3) 25x25x2	(3) 25x25x2	(10) 25x20x2	(5) 16x25x2
		(1) 15x25x2	(2) 20x25x2	(2) 25x25x2	(3) 25x25x2	(3) 25x25x2	(3) 20x20x2	(3) 20x20x2	(4) 20x25x2	(4) 20x25x2	(2) 16x25x2	(5) 22x25x2
		(2) 20x20x2							(1) 20x20x2	(1) 20x20x2	(5) 20x20x2	(10) 25x25x2
		(1) 20x25x2							(3) 25x16x2	(3) 25x16x2	(1) 16x20x2	
									(1) 20x16x2	(1) 20x16x2		
Refrigerant Charge												
Circuit 1	(kg)	14.6	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	27.0	27.0
Circuit 2	(kg)	-	-	-	7.3	7.3	16.8	16.8	16.8	16.8	27.0	27.0
Circuit 3	(kg)										27.0	27.0
Circuit 4	(kg)											27.0
Dimensions [uncrated]												
Height	(mm)	1453	1923	1898	2065	2065	2065	2065	2065	2065	2260	2519
Width	(mm)	1989	1989	1989	2263	2263	2769	2769	2769	2769	3232	3577
Depth	(mm)	874	1061	1061	1061	1061	1275	1275	1275	1275	1345	1500
Appx. Operating Weight	(kg)	567	927	980	1226	1199	1585	1594	1722	1730	1779	2046

Notes:

- Gross Cooling Capacity based on 85/95 deg F [29.5-35C], EWT-LWT and 80/67 deg F [27/19C] on coil conditions & Nominal airflows.
- RLA/LRA, FLA, MCA Rated at 400V
- 1 inch Washable (270-800), 2 inch Washable (900-1200)
- RLA rated at ARI 360 Conditions

Selection Procedure

Selection Example

Design specification

Total net capacity required = 320 MBh.
Total Sensible capacity required = 210 MBh. Entering air temperature = 80 db/67 WB °F.

Entering water temperature 85 F.

Leaving water temperature 95 F.

Design airflow = 8316 cfm.

External static pressure drop - 1.0" wg.

Unit Selection

1. From general specification tentatively select 320 MBh unit, model WCVS 400 noting gross total and sensible capacities gpm and EWT 85/LWL 95

Total MBh = 322

Sensible MBh = 221

GPM = 74

Since the design airflow is less than rated airflow, the gross capacities and condenser water flow rate needs to be adjusted to reflect the lower cfm:

Design cfm/nominal cfm = $8316/9240$
(less 10% rated cfm)

2. From the capacity correction Table 1

Gross total cooling capacity correction factor = 0.98.

Gross sensible cooling capacity correction factor = 0.96.

Condenser flow rate correction factor from Table 1 = 0.98.

Multiply the capacities by the correction factors:

Gross total cooling capacity = $0.98 \times 323 = 317$.

Gross sensible cooling capacity = $221 \times 0.96 = 212$ MBh

Condenser flow rate - 0.98×74 GPM = 73 US GPM.

3. From Table 1.23 condenser water pressure drop = 12ft. wg.

4. From Fan Table 2 using design cfm and design external static pressure drop, the fan Bhp is 4.5 and fan RPM is 853.

5. Fan motor heat $2.55 \times 4.5 = 11.5$ MBh

6. Net total cooling capacity $317 - 11.5 = 306$ MBh.

Net sensible cooling capacity $212 - 11.5 = 200$ MBh.

Refer to the Trane psychometric chart to determine leaving air temperature

$$Q_t = 4.5 \times \text{CFM} \times \Delta H$$

$$Q_s = 1.085 \times \text{CFM} \times \Delta T$$

Q_t = Total Capacity in BTUH
 Q_s = Sensible Capacity in BTUH
 ΔH = Entering - Leaving Enthalpy (Btu/lb)
 ΔT = Entering - Leaving Temperature °F

Correction Factors

Table 1

Cooling Correction Factor Capacities for Cfm / Cmh other than standard

% CFM / CMH Variation from Rated	-20	-10	Rated	+10	+20
Total Cooling Capacity Multiplier	0.96	0.98	1.00	1.02	1.03
Sensible Heat Multiplier	0.91	0.96	1.00	1.04	1.08
Condenser Water Flow	0.97	0.98	1.00	1.01	1.02

Note: Calculate total and sensible capacities in MBh and multiply by above factors to determine revised capacities.

Non Standard Condenser Water Temperature Rise Correction Factors

		Water Temp. Delta T		
C	F	Capacity	Power	Flow
5.0	9	1.00	0.99	1.11
5.6	10	Rated	Rated	Rated
6.7	12	1.00	1.02	0.83
7.8	14	0.99	1.04	0.72
8.9	16	0.99	1.06	0.63
10.0	18	0.98	1.08	0.56
11.1	20	0.98	1.11	0.50



Fan Performance Data

Table 2

Evaporator Fan Performance - WCVS 270

English Unit

External Static Pressure (in. wg)																				
0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0				
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4950	671	1.5	700	1.6	757	1.8	814	2.0	867	2.2	919	2.4	967	2.7	1013	2.9	1058	3.1		
5470	710	1.9	736	2	788	2.2	839	2.4	890	2.6	942	2.9	990	3.1	1035	3.3	1077	3.6		
6190	771	2.7	795	2.8	842	3	887	3.2	934	3.5	980	3.7	1023	4	1067	4.2	-	-		
6560	803	3	826	3.2	870	3.4	912	3.6	957	3.9	999	4.1	1040	4.4	1083	4.7	-	-		
7530	889	4.3	910	4.5	951	4.8	990	5.1	1026	5.4	1063	5.6	1102	6	-	-	-	-		

SI Unit

External Static Pressure (Pa)																				
125		150		200		250		300		350		400		450		500				
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW
8410	671	1.1	700	1.2	757	1.3	814	1.5	867	1.6	919	1.8	967	2.0	1013	2.2	1058	2.3		
9280	710	1.4	736	1.5	788	1.6	839	1.8	890	1.9	942	2.2	990	2.3	1035	2.5	1077	2.7		
10520	771	2.0	795	2.1	842	2.2	887	2.4	934	2.6	980	2.8	1023	3.0	1067	3.1	-	-		
11140	803	2.2	826	2.4	870	2.5	912	2.7	957	2.9	999	3.1	1040	3.3	1083	3.5	-	-		
12800	889	3.2	910	3.4	951	3.6	990	3.8	1026	4.0	1063	4.2	1102	4.5	-	-	-	-		

Std. Motor is 5hp (3.7kW).
Nominal: 6190cfm/ 1.1" ESP

High Static Option is 7.5hp (5.5kW)
Standard: 6190cfm/ 1.8" ESP

Evaporator Fan Performance - WCVS 330

English Unit

External Static Pressure (in. wg)																				
0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0				
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6207	634	1.9	661	2.0	713	2.3	764	2.5	812	2.8	860	3.1	907	3.4	953	3.7	999	4.1		
6760	662	2.2	687	2.3	736	2.7	784	2.8	831	3.1	876	3.5	919	3.8	961	4.1	1002	4.4		
7760	725	3.1	748	3.3	791	3.5	834	4.0	876	4.2	917	4.4	958	4.8	999	5.2	1036	5.5		
7880	732	3.2	755	3.4	798	3.6	840	4.1	881	4.3	922	4.6	963	4.9	1003	5.3	1040	5.7		
9010	805	4.5	825	4.7	866	5.1	903	5.3	941	5.9	977	6.3	1013	6.5	1049	6.8	1065	7.1		
9460	835	5.1	855	5.3	894	5.8	931	6.1	967	6.5	1001	7.0	1036	7.3	1071	7.7	1105	8.0		

SI Unit

External Static Pressure (Pa)																				
125		150		200		250		300		350		400		450		500				
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW
10546	634	1.42	661	1.49	713	1.72	764	1.866	812	2.09	860	2.31	907	2.537	953	2.76	999	3.1		
11485	662	1.64	687	1.72	736	2.0	784	2.09	831	2.31	876	2.61	919	2.836	961	3.06	1002	3.3		
13184	725	2.31	748	2.46	791	2.61	834	3.0	876	3.13	917	3.28	958	3.582	999	3.88	1036	4.1		
13388	732	2.39	755	2.54	798	2.69	840	3.1	881	3.21	922	3.43	963	3.657	1003	4.0	1040	4.3		
15308	805	3.36	825	3.51	866	3.81	903	4.0	941	4.4	977	4.7	1013	4.851	1049	5.07	1065	5.3		
16073	835	3.81	855	4.0	894	4.33	931	4.552	967	4.85	1001	5.22	1036	5.448	1071	5.75	1105	6.0		

Std. Motor is 5hp (3.7kW).
Nominal: 7760cfm/ 1.1" ESP

High Static Option is 10hp (7.5kW)
Standard: 7760cfm/ 1.8" ESP



Fan Performance Data

Evaporator Fan Performance - WCVS 400

English Unit

		External Static Pressure (in. wg)																	
		0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
7440	692	2.7	717	2.9	762	3.2	807	3.5	851	3.8	894	4.0	936	4.4	976	4.7	1016	5.1	
7880	719	3.1	743	3.3	786	3.5	829	4.0	870	4.3	911	4.5	952	4.8	992	5.2	1030	5.6	
9000	790	4.4	810	4.5	852	5.0	890	5.2	927	5.6	964	6.2	1000	6.4	1036	6.6	1072	7.0	
9240	806	4.7	825	4.9	866	5.3	904	5.6	940	6.0	977	6.5	1012	6.8	1047	7.1	1082	7.4	
10130	865	6.0	882	6.1	919	6.5	956	7.0	990	7.3	1023	7.7	1057	8.3	1089	8.8	-	-	
11260	924	8.0	958	8.2	990	8.5	1023	9.0	1057	9.6	1088	9.9	-	-	-	-	-	-	

SI Unit

		External Static Pressure (Pa)																	
		125		150		200		250		300		350		400		450		500	
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	
12641	692	2.0	717	2.2	762	2.4	807	2.6	851	2.8	894	3.0	936	3.3	976	3.5	1016	3.8	
13388	719	2.3	743	2.5	786	2.6	829	3.0	870	3.2	911	3.4	952	3.6	992	3.9	1030	4.2	
15291	790	3.3	810	3.4	852	3.7	890	3.9	927	4.2	964	4.6	1000	4.8	1036	4.9	1072	5.2	
15699	806	3.5	825	3.7	866	4.0	904	4.2	940	4.5	977	4.9	1012	5.1	1047	5.3	1082	5.5	
17211	865	4.5	882	4.6	919	4.9	956	5.2	990	5.4	1023	5.7	1057	6.2	1089	6.6	-	-	
19131	924	6.0	958	6.1	990	6.3	1023	6.7	-	-	-	-	-	-	-	-	-	-	

Std. Motor is 7.5hp (5.5kW).
Nominal: 9240cfm/1" ESP

High Static Option is 10hp (7.5kW)
Standard: 9240cfm/ 1.8" ESP

Evaporator Fan Performance - WCVS 470 - 530

English Unit

		External Static Pressure (in. wg)																	
		0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
9680	609	2.9	737	3.2	799	3.6	861	4.0	918	4.4	971	4.8	1021	5.2	1068	5.6	1115	6.2	
10140	631	3.3	754	3.5	812	3.9	873	4.4	930	4.8	983	5.2	1032	5.8	1078	6.2	1124	6.6	
11260	687	4.3	798	4.6	854	4.9	906	5.4	960	5.9	1014	6.4	1062	6.9	1108	7.4	1152	7.9	
12120	730	5.2	835	5.4	887	5.9	937	5.9	986	6.8	1036	7.4	1085	8.0	1131	8.6	1175	8.9	
12390	744	5.5	847	5.8	897	6.2	947	6.7	994	7.2	1043	7.8	1093	8.3	1139	8.9	1182	9.4	
13520	802	6.8	900	7.1	943	7.6	990	8.2	1035	8.7	1078	9.3	1123	9.8	1169	10.5	-	-	
14670	863	8.6	954	8.9	996	9.4	1035	9.9	1079	10.6	1154	11.3	1200	12.1	-	-	-	-	

SI Unit

		External Static Pressure (Pa)																	
		125		150		200		250		300		350		400		450		500	
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	
16446	609	2.2	737	2.4	799	2.7	861	3.0	918	3.3	971	3.6	1021	3.9	1068	4.2	1115	4.6	
17228	631	2.5	754	2.6	812	2.9	873	3.3	930	3.6	983	3.9	1032	4.3	1078	4.6	1124	4.9	
19131	687	3.2	798	3.4	854	3.7	906	4.0	960	4.4	1014	4.8	1062	5.1	1108	5.5	1152	5.9	
20592	730	3.9	835	4.0	887	4.4	937	4.4	986	5.1	1036	5.5	1085	6.0	1131	6.4	1175	6.6	
21051	744	4.1	847	4.3	897	4.6	947	5.0	994	5.4	1043	5.8	1093	6.2	1139	6.6	1182	7.0	
22971	802	5.1	900	5.3	943	5.7	990	6.1	1035	6.5	1078	6.9	1123	7.3	1169	7.8	-	-	
24924	863	6.4	954	6.6	996	7.0	1035	7.4	1079	7.9	1154	8.4	1200	9.0	-	-	-	-	

Std. Motor is 7.5hp (5.5kW).
Nominal: 10750cfm/ 1" ESP & 12120 cfm/ 0.9 ESP

High Static Option is 15hp (11kW)
Nominal: 10750cfm/ 1.8" ESP & 12120cfm/1.8" ESP



Fan Performance Data

Evaporator Fan Performance - WCVS 600 - 660

English Unit

External Static Pressure (in. wg)																									
		0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0		2.2		2.4		2.6	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
12060	479	2.6	509	2.9	570	3.5	638	4.5	698	5.5	745	6.3	787	6.9	826	7.6	865	8.2	904	8.9	943	9.6	963	9.9	
12780	489	2.9	516	3.2	574	3.7	634	4.6	702	5.8	754	6.8	796	7.6	834	8.2	871	8.9	907	9.6	944	10.3	963	10.6	
13940	511	3.5	536	3.8	587	4.4	638	5.0	695	6.0	758	7.4	808	8.5	849	9.4	885	10.2	920	10.9	953	11.6	970	12.0	
15130	532	4.2	556	4.5	602	5.1	651	5.8	697	6.5	751	7.6	810	9.1	859	10.4	899	11.5	934	12.3	967	13.2	983	13.5	
16260	553	5.0	577	5.3	622	6.0	664	6.6	710	7.4	753	8.1	802	9.3	858	10.9	907	12.4	947	13.7	982	14.7	998	15.2	
17420	577	5.9	601	6.2	642	6.9	682	7.6	722	8.4	766	9.2	805	10.0	850	11.1	902	12.8	951	14.6	992	16.0	-	-	
18310	597	6.6	619	7.0	658	7.7	698	8.5	734	9.2	775	10.0	815	10.9	854	11.8	897	13.1	945	14.7	991	16.6	-	-	

SI Unit

External Static Pressure (Pa)																									
		125		150		200		250		300		350		400		450		500		550		600		650	
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	
20490	479	1.9	509	2.2	570	2.6	638	3.4	698	4.1	745	4.7	787	5.1	826	5.7	865	6.1	904	6.6	943	7.2	963	7.4	
21713	489	2.2	516	2.4	574	2.8	634	3.4	702	4.3	754	5.1	796	5.7	834	6.1	871	6.6	907	7.2	944	7.7	963	7.9	
23684	511	2.6	536	2.8	587	3.3	638	3.7	695	4.5	758	5.5	808	6.3	849	7.0	885	7.6	920	8.1	953	8.7	970	9.0	
25706	532	3.1	556	3.4	602	3.8	651	4.3	697	4.9	751	5.7	810	6.8	859	7.8	899	8.6	934	9.2	967	9.9	983	10.1	
27626	553	3.7	577	4.0	622	4.5	664	4.9	710	5.5	753	6.0	802	6.9	858	8.1	907	9.3	947	10.2	982	11.0	998	11.3	
29597	577	4.4	601	4.6	642	5.1	682	5.7	722	6.3	766	6.9	805	7.5	850	8.3	902	9.6	951	10.9	992	11.9	-	-	
31109	597	4.9	619	5.2	658	5.7	698	6.3	734	6.9	775	7.5	815	8.1	854	8.8	897	9.8	945	11.0	991	12.4	-	-	

Std. Motor is 10hp (7.5kW). High Static Option is 20hp (15kW)
 Nominal: 13800cfm/1.4" ESP & 15130cfm/1.5" ESP Nominal: 13800cfm/ 1.8" ESP & 15130cfm/1.8" ESP

Evaporator Fan Performance - WCVS 730 - 800

English Unit

External Static Pressure (in. wg)																									
		0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0		2.2		2.4		2.6	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
14460	569	5.0	592	5.3	635	5.9	682	6.6	728	7.4	777	8.5	832	9.9	882	11.4	923	12.6	959	13.6	992	14.5	-	-	
14900	579	5.3	602	5.7	643	6.3	689	7.0	733	7.8	777	8.6	831	10.1	885	11.8	929	13.1	966	14.2	999	15.2	-	-	
15960	605	6.3	625	6.6	667	7.3	705	8.0	749	8.9	789	9.6	831	10.6	881	12.1	932	13.9	977	15.5	-	-	-	-	
17030	631	7.4	651	7.7	691	8.5	727	9.2	765	10.0	806	10.9	843	11.7	882	12.7	928	14.2	977	16.1	-	-	-	-	
18090	658	8.6	677	9.0	714	9.8	751	10.6	785	11.3	821	12.2	860	13.2	895	14.0	931	15.1	973	16.6	-	-	-	-	
19160	686	9.9	705	10.4	739	11.2	775	12.1	808	12.9	840	13.7	876	14.7	912	15.7	945	16.6	-	-	-	-	-	-	
20220	713	11.4	732	11.9	765	12.8	799	13.7	832	14.6	862	15.4	893	16.3	927	17.4	-	-	-	-	-	-	-	-	
21280	740	13.1	759	13.6	792	14.5	823	15.4	856	16.4	886	17.3	-	-	-	-	-	-	-	-	-	-	-	-	
21900	756	14.1	775	14.6	808	15.6	838	16.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

SI Unit

External Static Pressure (Pa)																									
		125		150		200		250		300		350		400		450		500		550		600		650	
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	
24568	569	3.7	592	4.0	635	4.4	682	4.9	728	5.5	777	6.3	832	7.4	882	8.5	923	9.4	959	10.1	992	10.8	-	-	
25315	579	4.0	602	4.3	643	4.7	689	5.2	733	5.8	777	6.4	831	7.5	885	8.8	929	9.8	966	10.6	999	11.3	-	-	
27116	605	4.7	625	4.9	667	5.4	705	6.0	749	6.6	789	7.2	831	7.9	881	9.0	932	10.4	977	11.6	-	-	-	-	
28934	631	5.5	651	5.7	691	6.3	727	6.9	765	7.5	806	8.1	843	8.7	882	9.5	928	10.6	977	12.0	-	-	-	-	
30735	658	6.4	677	6.7	714	7.3	751	7.9	785	8.4	821	9.1	860	9.9	895	10.4	931	11.3	973	12.4	-	-	-	-	
32553	686	7.4	705	7.8	739	8.4	775	9.0	808	9.6	840	10.2	876	11.0	912	11.7	945	12.4	-	-	-	-	-	-	
34354	713	8.5	732	8.9	765	9.6	799	10.2	832	10.9	862	11.5	893	12.2	927	13.0	-	-	-	-	-	-	-	-	
36155	740	9.8	759	10.1	792	10.8	823	11.5	856	12.2	886	12.9	-	-	-	-	-	-	-	-	-	-	-	-	
37208	756	10.5	775	10.9	808	11.6	838	12.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Std. Motor is 15hp (11kW). High Static Option is 20hp (15kW)
 Nominal: 16880cfm/1.3" ESP & 18080cfm/1.1" ESP Nominal: 16880cfm/ 1.8" ESP & 18080cfm/1.8" ESP

Notes
 To determine power of the motor to be installed, the following correction factors have to be applied to the fan Shaft Absorbed hp.
 Fan Motor hp = Absorbed Fan Shaft hp x Correction Factor
 Correction Factor = 1.2 for Absorbed Fan Shaft < 10kW (13.4hp)
 Correction Factor = 1.15 for Absorbed Fan Shaft > 10kW (13.4hp)
 Fan Motor Heat (MBH) = 2.55 x BHP
 Data Includes pressure drop due to filters and wet coil.



Fan Performance Data

Evaporator Fan Performance (WCVS 900)

English Unit

		External Static Pressure (in. wg)																							
		0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0		2.2		2.4		2.6	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
21036	640	9.90	659	10.38	697	11.36	734	12.36	769	13.38	803	14.44	836	15.50	868	16.59	899	17.67	930	18.80	960	19.97	990	21.17	
22274	648	10.98	667	11.47	703	12.47	739	13.52	774	14.58	808	15.66	840	16.76	872	17.89	902	19.03	932	20.18					
23511	658	12.18	675	12.67	711	13.69	746	14.76	780	15.86	812	16.99	844	18.13	875	19.28	906	20.46							
24749	668	13.46	685	13.99	719	15.03	753	16.12	786	17.26	818	18.41	849	19.59	880	20.77									
25986	679	14.85	696	15.39	729	16.49	761	17.61	793	18.76	824	19.94	855	21.16											
27223	690	16.33	707	16.91	739	18.08	770	19.23	801	20.38															
28461	702	17.94	718	18.53	750	19.74	780	20.96																	

Std. Motor is 20hp (15kW). High Static Option is 25hp (18.5kW)
Nominal: 24750cfm/1.2" esp

SI Unit

		External Static Pressure (Pa)																							
		125		150		200		250		300		350		400		450		500		550		600		650	
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	
35741	640	7.38	659	7.74	697	8.47	734	9.22	769	9.98	803	10.77	836	11.56	868	12.37	899	13.18	930	14.02	960	14.89	990	15.79	
37843	648	8.19	667	8.55	703	9.30	739	10.08	774	10.87	808	11.68	840	12.50	872	13.34	902	14.19	932	15.05					
39946	658	9.08	675	9.45	711	10.21	746	11.01	780	11.83	812	12.67	844	13.52	875	14.38	906	15.26							
42048	668	10.04	685	10.43	719	11.21	753	12.02	786	12.87	818	13.73	849	14.61	880	15.49									
44150	679	11.07	696	11.48	729	12.30	761	13.13	793	13.99	824	14.87	855	15.78											
46253	690	12.18	707	12.61	739	13.48	770	14.34	801	15.20															
48355	702	13.38	718	13.82	750	14.72	780	15.63																	

Evaporator Fan Performance (WCVS 12H)

English Unit

		External Static Pressure (in. wg)																							
		0.5		0.6		0.8		1.0		1.2		1.4		1.6		1.8		2.0		2.2		2.4		2.6	
CFM	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
28042	570	13.20	586	13.77	618	14.95	649	16.20	679	17.47	707	18.73	735	20.01	762	21.30	789	22.64	816	24.02	843	25.48			
29692	579	14.72	595	15.31	625	16.53	655	17.80	685	19.11	713	20.45	740	21.79	767	23.13	792	24.49							
31341	589	16.37	604	17.00	633	18.26	662	19.55	691	20.89	719	22.27	746	23.68	772	25.10									
32991	599	18.16	614	18.83	643	20.16	671	21.48	698	22.85	725	24.26													
34641	609	20.06	624	20.77	653	22.19	680	23.59	706	24.98															
36290	619	22.11	634	22.85	662	24.37																			
37940	631	24.37	645	25.12																					

Std. Motor is 30hp (22kW).
Nominal: 33000cfm/1.2" esp

SI Unit

		External Static Pressure (Pa)																							
		125		150		200		250		300		350		400		450		500		550		600		650	
CMH	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	
47644	570	9.84	586	10.27	618	11.15	649	12.08	679	13.03	707	13.97	735	14.92	762	15.88	789	16.88	816	17.91	843	19.00			
50447	579	10.98	595	11.42	625	12.33	655	13.27	685	14.25	713	15.25	740	16.25	767	17.25	792	18.26							
53249	589	12.21	604	12.68	633	13.62	662	14.58	691	15.58	719	16.61	746	17.66	772	18.72									
56052	599	13.54	614	14.04	643	15.03	671	16.02	698	17.04	725	18.09													
58855	609	14.96	624	15.49	653	16.55	680	17.59	706	18.63															
61657	619	16.49	634	17.04	662	18.17																			
64460	631	18.17	645	18.73																					

Notes

To determine power of the motor to be installed, the following correction factors have to be applied to the fan Shaft Absorbed hp.

Fan Motor hp = Absorbed Fan Shaft hp x Correction Factor

Correction Factor = 1.2 for Absorbed Fan Shaft < 10kW (13.4hp)

Correction Factor = 1.15 for Absorbed Fan Shaft > 10kW (13.4hp)

Fan Motor Heat (MBH) = 2.55 x BHP

Data Includes pressure drop due to filters and wet coil.

Note: Assume TSP = ESP + 200 Pa [for internal losses due to casing, coil, filter]

Catalogue Data

Table 3

Condenser Leaving Water Temperature (Delta T = 10F)

English Unit

Model WCVS	Entering DB deg F	Entering WB deg F	85 (°F)				95 (°F)				105 (°F)			
			Total MBH	Sens. MBH	GPM	Comp. kW	Total MBH	Sens MBH	GPM	Comp. kW	Total MBH	Sens MBH	GPM	Comp. kW
270 (2X10 TON)	75	62	203.1	154.4	45.1	11.7	196.4	151.4	44.9	13.1	189.1	148.0	44.7	14.8
		67	221.7	125.0	48.6	11.8	214.4	122.0	48.3	13.2	206.6	118.7	48.0	14.9
		72	241.5	95.3	52.3	11.9	233.5	92.3	51.9	13.4	225.1	89.1	51.5	15.0
	80	62	203.3	182.3	45.2	11.7	196.8	179.1	45.0	13.1	189.8	175.5	44.9	14.8
		67	221.4	152.8	48.6	11.8	214.3	149.7	48.3	13.2	206.4	146.4	48.0	14.9
		72	241.2	123.0	52.3	11.9	233.4	120.0	51.9	13.4	225.0	116.8	51.5	15.0
	85	62	207.4	206.4	45.9	11.7	201.6	201.7	45.9	13.2	195.8	195.8	46.0	14.8
		67	221.3	180.4	48.6	11.8	214.1	177.3	48.3	13.2	206.3	174.0	48.0	14.9
		72	241.0	150.5	52.3	11.9	233.2	147.5	51.9	13.4	224.7	144.3	51.5	15.0
300	75	62	261.5	194.7	58.8	16.0	253.7	191.0	58.8	18.0	245.1	186.9	58.7	20.2
		67	286.3	159.2	63.5	16.3	277.8	155.5	63.4	18.3	268.4	151.5	63.2	20.5
		72	312.7	123.2	68.5	16.6	303.4	119.6	68.2	18.6	293.2	115.7	68.0	20.8
	80	62	261.5	228.6	58.8	16.0	253.8	224.8	58.8	18.0	245.3	220.7	58.8	20.2
		67	286.1	192.9	63.5	16.3	277.5	189.3	63.3	18.3	268.1	185.2	63.2	20.5
		72	312.5	157.0	68.5	16.5	303.2	153.3	68.2	18.5	292.9	149.4	67.9	20.8
	85	62	265.4	260.0	59.5	16.1	258.4	255.3	59.6	18.1	250.8	249.8	59.8	20.3
		67	285.9	226.6	63.4	16.3	277.3	222.9	63.3	18.3	267.9	218.8	63.1	20.5
		72	312.2	190.5	68.4	16.5	302.9	186.9	68.2	18.5	292.7	182.8	67.9	20.8
400	75	62	304.3	227.9	69.1	19.6	295.0	223.5	69.0	21.9	284.8	218.7	68.9	24.5
		67	332.9	185.8	74.6	20.0	322.7	181.5	74.4	22.3	311.6	176.8	74.1	24.9
		72	363.3	143.2	80.4	20.3	352.3	138.9	80.0	22.7	340.1	134.3	79.7	25.3
	80	62	304.3	268.0	69.1	19.6	295.2	263.6	69.1	21.9	285.2	258.6	69.0	24.5
		67	332.6	225.8	74.5	20.0	322.5	221.4	74.3	22.3	311.3	216.7	74.1	24.9
		72	363.0	183.0	80.3	20.3	352.0	178.9	80.0	22.7	339.9	174.1	79.6	25.3
	85	62	309.3	304.6	70.1	19.7	301.1	298.9	70.2	22.0	292.3	291.9	70.4	24.6
		67	332.3	265.5	74.5	20.0	322.2	261.1	74.2	22.3	311.1	256.4	74.0	24.9
		72	362.8	222.8	80.3	20.3	351.8	218.5	79.9	22.7	339.6	213.8	79.5	25.3
470	75	62	378.1	289.2	84.5	22.5	366.1	283.7	84.2	25.2	352.9	277.6	84.0	28.3
		67	413.4	234.0	91.2	22.8	400.3	228.5	90.8	25.5	386.0	222.4	90.4	28.7
		72	450.8	178.0	98.3	23.1	436.6	172.6	97.6	25.9	421.2	166.9	97.1	29.1
	80	62	378.7	341.7	84.7	22.5	367.1	335.8	84.4	25.2	354.4	329.5	84.3	28.3
		67	412.9	286.3	91.1	22.8	399.9	280.9	90.7	25.5	385.7	274.9	90.2	28.7
		72	450.3	230.3	98.2	23.1	436.3	225.0	97.6	25.9	420.8	219.1	97.0	29.1
	85	62	387.5	385.9	86.3	22.5	377.5	376.9	86.4	25.3	366.5	366.5	86.6	28.5
		67	412.6	338.7	91.1	22.8	399.6	333.1	90.6	25.5	385.4	327.1	90.2	28.6
		72	450.0	282.4	98.2	23.1	435.9	277.0	97.5	25.9	420.4	271.2	96.9	29.1
530	75	62	407.0	302.8	92.1	25.7	394.4	296.9	91.9	28.7	380.4	290.3	91.7	32.2
		67	444.7	247.4	99.2	26.1	431.1	241.5	98.9	29.2	416.0	235.1	98.5	32.7
		72	485.1	191.2	106.9	26.5	470.1	185.4	106.3	29.7	453.8	179.1	105.8	33.1
	80	62	406.7	355.6	91.9	25.7	394.4	349.5	91.9	28.7	380.9	342.9	91.8	32.2
		67	444.5	299.9	99.2	26.1	430.8	294.0	98.8	29.2	415.7	287.5	98.5	32.7
		72	484.7	243.5	106.8	26.5	469.8	237.7	106.3	29.7	453.5	231.4	105.7	33.1
	85	62	412.6	404.6	93.1	25.8	401.3	397.0	93.2	28.8	389.2	388.0	93.4	32.3
		67	444.1	352.2	99.0	26.1	430.3	346.2	98.7	29.2	415.3	339.7	98.4	32.7
		72	484.3	295.7	106.7	26.5	469.4	289.9	106.2	29.7	453.1	283.6	105.6	33.1
600	75	62	509.0	395.3	112.4	28.3	492.0	387.4	111.8	31.7	473.8	379.1	111.2	35.7
		67	555.9	317.8	121.3	28.6	537.5	310.2	120.4	32.1	517.7	302.0	119.6	36.1
		72	605.9	239.8	130.8	29.1	586.1	232.3	129.6	32.5	564.5	224.4	128.5	36.5
	80	62	511.4	467.1	112.9	28.3	495.1	458.5	112.4	31.8	477.5	448.9	112.0	35.7
		67	555.4	391.1	121.2	28.6	537.1	383.4	120.4	32.1	517.2	375.1	119.4	36.1
		72	605.3	312.7	130.6	29.1	585.6	305.5	129.5	32.5	564.1	297.3	128.3	36.5
	85	62	524.9	521.3	115.4	28.4	510.2	508.9	115.2	31.9	494.3	494.5	115.1	35.9
		67	555.8	463.8	121.3	28.6	537.8	455.7	120.5	32.1	518.4	447.2	119.6	36.1
		72	604.9	385.6	130.6	29.1	585.1	378.0	129.5	32.5	563.8	369.9	128.3	36.5

Catalogue Data

Condenser Leaving Water Temperature (Delta T = 10F)

English Unit

Model WCVS	Entering DB deg F	Entering WB deg F	85 (°F)				95 (°F)				105 (°F)			
			Total MBH	Sens. MBH	GPM	Comp. kW	Total MBH	Sens MBH	GPM	Comp. kW	Total MBH	Sens MBH	GPM	Comp. kW
660	75	62	557.6	418.0	122.6	30.1	540.5	409.9	121.9	33.6	522.0	401.2	121.4	37.8
		67	609.7	340.5	132.3	30.3	591.3	332.5	131.5	33.9	571.1	324.1	130.7	38.1
		72	665.4	262.2	142.7	30.7	645.5	254.5	141.6	34.3	623.7	246.3	140.6	38.5
	80	62	558.5	491.4	122.7	30.1	541.8	483.0	122.2	33.6	523.6	473.9	121.8	37.8
		67	609.2	413.9	132.2	30.3	590.7	405.9	131.4	33.9	570.7	397.3	130.6	38.1
		72	664.8	335.5	142.6	30.7	644.9	327.7	141.5	34.3	623.3	319.3	140.5	38.5
	85	62	566.6	557.8	124.2	30.1	551.2	547.1	124.0	33.7	534.9	534.4	123.9	37.9
		67	608.9	487.1	132.1	30.3	590.5	479.1	131.3	33.9	570.7	470.4	130.6	38.1
		72	664.3	408.3	142.5	30.7	644.4	400.5	141.4	34.3	622.7	392.2	140.4	38.5
730	75	62	616.0	488.3	137.5	36.2	595.5	478.8	136.7	40.5	573.2	468.7	136.0	45.4
		67	672.2	389.7	148.2	36.8	650.0	380.6	147.2	41.2	625.8	370.6	146.2	46.1
		72	732.1	290.4	159.5	37.5	707.9	281.5	158.3	41.9	681.7	271.9	156.9	46.7
	80	62	620.2	578.5	138.3	36.3	600.5	567.8	137.7	40.5	579.4	555.9	137.2	45.4
		67	671.7	482.9	148.1	36.8	649.6	473.6	147.1	41.2	625.1	463.7	146.0	46.1
		72	731.4	383.4	159.5	37.5	707.4	374.4	158.1	41.9	681.1	364.8	156.8	46.8
	85	62	640.5	640.6	142.1	36.5	623.4	623.5	142.1	40.8	604.6	604.6	142.0	45.8
		67	672.7	575.0	148.3	36.8	650.9	565.4	147.4	41.2	627.2	554.5	146.4	46.1
		72	730.8	475.8	159.3	37.5	706.8	466.7	158.1	41.9	680.6	457.1	156.7	46.8
800	75	62	646.7	502.4	145.5	39.8	625.4	492.6	144.9	44.4	601.9	481.9	144.2	49.6
		67	705.8	403.6	156.8	40.5	682.6	393.9	155.9	45.2	657.1	383.5	154.9	50.4
		72	768.5	303.9	168.8	41.3	743.3	294.5	167.6	46.0	715.8	284.4	166.2	51.3
	80	62	649.6	594.3	146.1	39.9	629.0	583.7	145.6	44.5	606.4	571.8	145.1	49.7
		67	705.2	496.9	156.7	40.5	682.0	487.1	155.8	45.2	656.7	476.6	154.8	50.4
		72	767.9	396.9	168.7	41.3	742.7	387.4	167.5	46.0	715.2	377.2	166.1	51.3
	85	62	666.3	666.3	149.3	40.1	648.6	648.6	149.3	44.7	629.0	629.1	149.4	50.0
		67	705.5	589.6	156.8	40.5	682.7	579.7	155.9	45.2	657.8	568.7	155.0	50.4
		72	767.3	489.5	168.6	41.3	742.2	479.9	167.4	46.0	714.7	469.7	166.0	51.3
900	75	62	810.7	618.8	194	50.2	784.0	606.8	193	56.0	754.6	593.6	193	62.5
		67	884.8	497.2	209	51.1	855.7	485.2	208	57.0	823.8	472.4	207	63.6
		72	963.4	374.4	225	52.1	931.8	362.7	224	58.0	897.3	350.3	222	64.7
	80	62	814.3	732.1	195	50.3	788.5	719.0	194	56.1	760.3	704.3	194	62.7
		67	884.1	612.1	209	51.1	855.0	600.0	208	57.0	823.3	587.1	207	63.6
		72	962.7	488.9	225	52.1	931.1	477.2	224	58.0	896.6	464.6	222	64.7
	85	62	835.3	820.7	199	50.6	813.1	798.9	199	56.4	788.5	774.9	199	63.1
		67	884.5	726.3	209	51.1	855.8	714.1	208	57.0	824.7	700.5	207	63.6
		72	961.9	603.0	225	52.1	930.4	591.2	223	58.0	896.0	578.6	222	64.7
12H	75	62	1081.0	823.1	259	67.8	1045.3	807.0	258	75.6	1006.1	789.5	256	84.5
		67	1179.7	661.2	279	69.0	1140.9	645.4	277	77.0	1098.4	628.2	275	85.9
		72	1284.5	497.9	300	70.4	1242.4	482.4	298	78.4	1196.4	465.9	295	87.4
	80	62	1085.8	973.7	260	68.0	1051.4	956.2	259	75.8	1013.7	936.8	258	84.7
		67	1178.8	814.0	279	69.0	1140.0	798.0	277	77.0	1097.7	780.9	275	85.9
		72	1283.6	650.2	300	70.4	1241.5	634.7	298	78.4	1195.5	618.0	295	87.4
	85	62	1113.7	1091.6	265	68.3	1084.1	1062.6	265	76.1	1051.4	1030.7	266	85.2
		67	1179.3	966.0	279	69.0	1141.1	949.7	277	77.0	1099.5	931.7	276	85.9
		72	1282.5	802.0	300	70.4	1240.6	786.3	298	78.4	1194.6	769.5	295	87.4

- Notes:
- 1 All Capacities are gross and do not include fan motor heat gain.
 - 2 Total MBH = Total Gross Cooling Capacities
 - 3 Total Sensible MBH = Gross Sensible Heat Capacity

Catalogue Data

Condenser Leaving Water Temperature (Delta T = 5.5 C)

Metric Unit

Model WCVS	Entering DB deg C	Entering WB deg C	30 °C				35 °C				40 °C			
			Total kW	Sens. kW	L/Min	Comp. kW	Total kW	Sens. kW	L/Min	Comp. kW	Total kW	Sens. kW	L/Min	Comp. kW
270 (2 X 10 TON)	24	17	59.5	45.2	171	11.7	57.5	44.3	170	13.1	55.4	43.3	169	14.8
		19	64.9	36.6	184	11.8	62.8	35.7	183	13.2	60.5	34.8	182	14.9
		22	70.7	27.9	198	11.9	68.4	27.0	196	13.4	65.9	26.1	195	15.0
	27	17	59.5	53.4	171	11.7	57.6	52.4	170	13.1	55.6	51.4	170	14.8
		19	64.8	44.7	184	11.8	62.7	43.8	183	13.2	60.4	42.9	182	14.9
		22	70.6	36.0	198	11.9	68.3	35.1	196	13.4	65.9	34.2	195	15.0
	29	17	60.7	60.4	174	11.7	59.0	59.1	174	13.2	57.3	57.3	174	14.8
		19	64.8	52.8	184	11.8	62.7	51.9	183	13.2	60.4	51.0	182	14.9
		22	70.6	44.1	198	11.9	68.3	43.2	196	13.4	65.8	42.3	195	15.0
330	24	17	76.6	57.0	223	16.0	74.3	55.9	223	18.0	71.8	54.7	222	20.2
		19	83.8	46.6	240	16.3	81.3	45.5	240	18.3	78.6	44.4	239	20.5
		22	91.6	36.1	259	16.6	88.8	35.0	258	18.6	85.8	33.9	257	20.8
	27	17	76.6	66.9	223	16.0	74.3	65.8	223	18.0	71.8	64.6	223	20.2
		19	83.8	56.5	240	16.3	81.3	55.4	240	18.3	78.5	54.2	239	20.5
		22	91.5	46.0	259	16.5	88.8	44.9	258	18.5	85.8	43.7	257	20.8
	29	17	77.7	76.1	225	16.1	75.7	74.8	226	18.1	73.4	73.1	226	20.3
		19	83.7	66.4	240	16.3	81.2	65.3	240	18.3	78.4	64.1	239	20.5
		22	91.4	55.8	259	16.5	88.7	54.7	258	18.5	85.7	53.5	257	20.8
400	24	17	89.1	66.7	262	19.6	86.4	65.4	261	21.9	83.4	64.0	261	24.5
		19	97.5	54.4	282	20.0	94.5	53.1	282	22.3	91.2	51.8	280	24.9
		22	106.4	41.9	304	20.3	103.2	40.7	303	22.7	99.6	39.3	302	25.3
	27	17	89.1	78.5	262	19.6	86.4	77.2	262	21.9	83.5	75.7	261	24.5
		19	97.4	66.1	282	20.0	94.4	64.8	281	22.3	91.2	63.5	280	24.9
		22	106.3	53.6	304	20.3	103.1	52.4	303	22.7	99.5	51.0	301	25.3
	29	17	90.6	89.2	265	19.7	88.2	87.5	266	22.0	85.6	85.5	266	24.6
		19	97.3	77.8	282	20.0	94.3	76.5	281	22.3	91.1	75.1	280	24.9
		22	106.2	65.2	304	20.3	103.0	64.0	302	22.7	99.4	62.6	301	25.3
470	24	17	110.7	84.7	320	22.5	107.2	83.1	319	25.2	103.3	81.3	318	28.3
		19	121.0	68.5	345	22.8	117.2	66.9	344	25.5	113.0	65.1	342	28.7
		22	132.0	52.1	372	23.1	127.8	50.5	369	25.9	123.3	48.9	368	29.1
	27	17	110.9	100.0	321	22.5	107.5	98.3	319	25.2	103.8	96.5	319	28.3
		19	120.9	83.8	345	22.8	117.1	82.3	343	25.5	112.9	80.5	341	28.7
		22	131.9	67.4	372	23.1	127.7	65.9	369	25.9	123.2	64.2	367	29.1
	29	17	113.5	113.0	327	22.5	110.5	110.3	327	25.3	107.3	107.3	328	28.5
		19	120.8	99.2	345	22.8	117.0	97.5	343	25.5	112.9	95.8	341	28.6
		22	131.8	82.7	372	23.1	127.6	81.1	369	25.9	123.1	79.4	367	29.1
530	24	17	119.2	88.7	349	25.7	115.5	86.9	348	28.7	111.4	85.0	347	32.2
		19	130.2	72.4	376	26.1	126.2	70.7	374	29.2	121.8	68.8	373	32.7
		22	142.0	56.0	405	26.5	137.7	54.3	402	29.7	132.9	52.4	400	33.1
	27	17	119.1	104.1	348	25.7	115.5	102.3	348	28.7	111.5	100.4	348	32.2
		19	130.2	87.8	376	26.1	126.1	86.1	374	29.2	121.7	84.2	373	32.7
		22	141.9	71.3	404	26.5	137.6	69.6	402	29.7	132.8	67.8	400	33.1
	29	17	120.8	118.5	352	25.8	117.5	116.2	353	28.8	114.0	113.6	354	32.3
		19	130.0	103.1	375	26.1	126.0	101.4	374	29.2	121.6	99.5	372	32.7
		22	141.8	86.6	404	26.5	137.4	84.9	402	29.7	132.7	83.0	400	33.1
600	24	17	149.0	115.8	425	28.3	144.1	113.4	423	31.7	138.7	111.0	421	35.7
		19	162.8	93.1	459	28.6	157.4	90.8	456	32.1	151.6	88.4	453	36.1
		22	177.4	70.2	495	29.1	171.6	68.0	491	32.5	165.3	65.7	486	36.5
	27	17	149.7	136.8	427	28.3	145.0	134.2	425	31.8	139.8	131.4	424	35.7
		19	162.6	114.5	459	28.6	157.3	112.2	456	32.1	151.4	109.8	452	36.1
		22	177.2	91.6	494	29.1	171.5	89.4	490	32.5	165.2	87.1	486	36.5
	29	17	153.7	152.6	437	28.4	149.4	149.0	436	31.9	144.7	144.8	436	35.9
		19	162.8	135.8	459	28.6	157.5	133.4	456	32.1	151.8	130.9	453	36.1
		22	177.1	112.9	494	29.1	171.3	110.7	490	32.5	165.1	108.3	486	36.5

Catalogue Data

Condenser Leaving Water Temperature (Delta T = 5.5 C)

Metric Unit

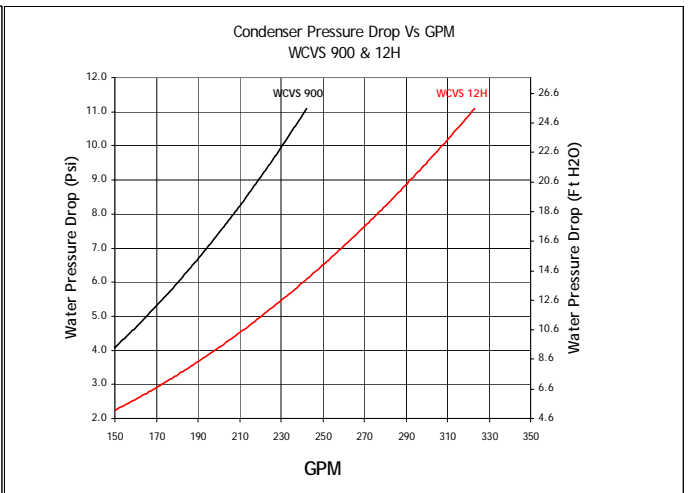
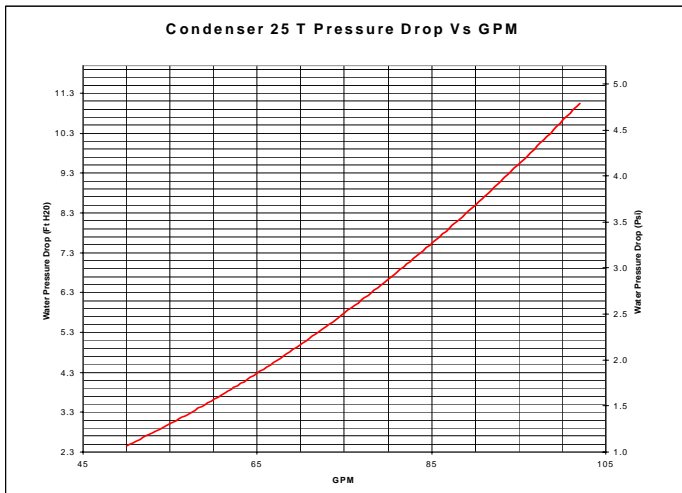
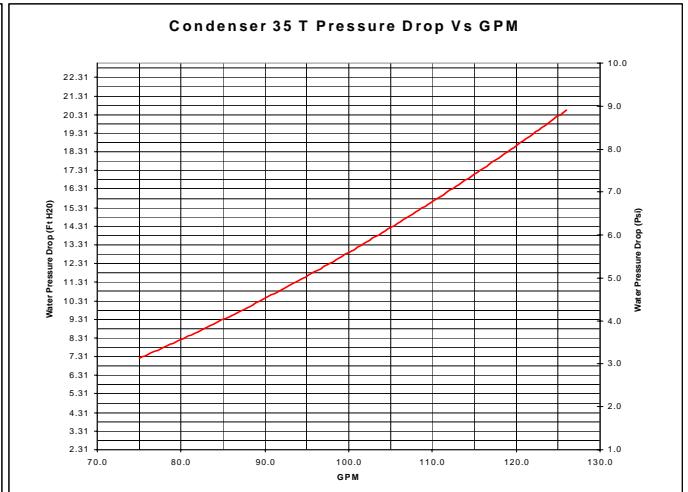
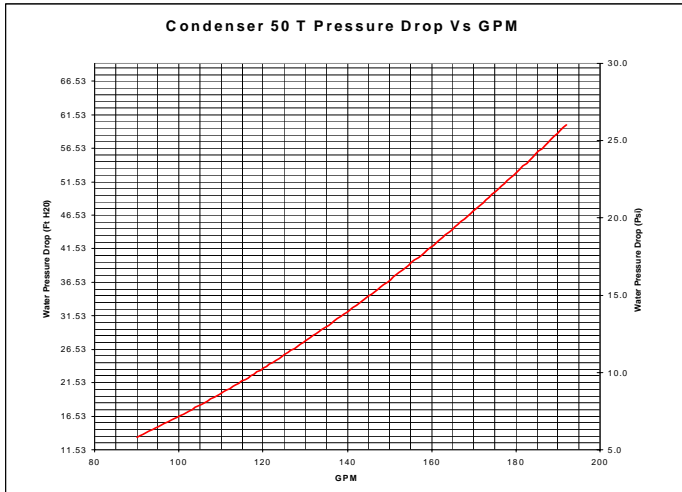
Model WCVS	Entering DB deg C	Entering WB deg C	30 °C				35 °C				40 °C			
			Total kW	Sens. kW	L/Min	Comp. kW	Total kW	Sens. kW	L/Min	Comp. kW	Total kW	Sens. kW	L/Min	Comp. kW
660	24	17	163.3	122.4	464	30.1	158.3	120.0	461	33.6	152.8	117.5	460	37.8
		19	178.5	99.7	501	30.3	173.1	97.4	498	33.9	167.2	94.9	495	38.1
		22	194.8	76.8	540	30.7	189.0	74.5	536	34.3	182.6	72.1	532	38.5
	27	17	163.5	143.9	464	30.1	158.6	141.4	463	33.6	153.3	138.8	461	37.8
		19	178.4	121.2	500	30.3	173.0	118.9	497	33.9	167.1	116.3	494	38.1
		22	194.7	98.2	540	30.7	188.8	96.0	536	34.3	182.5	93.5	532	38.5
	29	17	165.9	163.3	470	30.1	161.4	160.2	469	33.7	156.6	156.5	469	37.9
		19	178.3	142.6	500	30.3	172.9	140.3	497	33.9	167.1	137.7	494	38.1
		22	194.5	119.6	539	30.7	188.7	117.3	535	34.3	182.3	114.8	531	38.5
730	24	17	180.4	143.0	520	36.2	174.4	140.2	517	40.5	167.8	137.2	515	45.4
		19	196.8	114.1	561	36.8	190.3	111.4	557	41.2	183.2	108.5	553	46.1
		22	214.4	85.0	604	37.5	207.3	82.4	599	41.9	199.6	79.6	594	46.7
	27	17	181.6	169.4	524	36.3	175.8	166.3	521	40.5	169.6	162.8	519	45.4
		19	196.7	141.4	561	36.8	190.2	138.7	557	41.2	183.0	135.8	553	46.1
		22	214.2	112.2	604	37.5	207.1	109.6	598	41.9	199.4	106.8	594	46.8
	29	17	187.6	187.6	538	36.5	182.5	182.6	538	40.8	177.0	177.0	538	45.8
		19	197.0	168.4	561	36.8	190.6	165.6	558	41.2	183.7	162.4	554	46.1
		22	214.0	139.3	603	37.5	206.9	136.7	598	41.9	199.3	133.8	593	46.8
800	24	17	189.4	147.1	551	39.8	183.1	144.2	549	44.4	176.2	141.1	546	49.6
		19	206.7	118.2	594	40.5	199.9	115.3	590	45.2	192.4	112.3	586	50.4
		22	225.0	89.0	639	41.3	217.6	86.2	634	46.0	209.6	83.3	629	51.3
	27	17	190.2	174.0	553	39.9	184.2	170.9	551	44.5	177.6	167.4	549	49.7
		19	206.5	145.5	593	40.5	199.7	142.6	590	45.2	192.3	139.6	586	50.4
		22	224.9	116.2	639	41.3	217.5	113.4	634	46.0	209.4	110.4	629	51.3
	29	17	195.1	195.1	565	40.1	189.9	189.9	565	44.7	184.2	184.2	566	50.0
		19	206.6	172.6	594	40.5	199.9	169.7	590	45.2	192.6	166.5	587	50.4
		22	224.7	143.3	638	41.3	217.3	140.5	634	46.0	209.3	137.5	628	51.3
900	24	17	237.4	181.2	735	50.2	229.6	177.7	732	56.0	221.0	173.8	729	62.5
		19	259.1	145.6	792	51.1	250.6	142.1	788	57.0	241.2	138.3	783	63.6
		22	282.1	109.6	853	52.1	272.8	106.2	847	58.0	262.7	102.6	840	64.7
	27	17	238.4	214.4	738	50.3	230.9	210.5	736	56.1	222.6	206.2	733	62.7
		19	258.9	179.2	792	51.1	250.4	175.7	787	57.0	241.1	171.9	782	63.6
		22	281.9	143.2	853	52.1	272.6	139.7	846	58.0	262.5	136.0	839	64.7
	29	17	244.6	240.3	755	50.6	238.1	233.9	755	56.4	230.9	226.9	755	63.1
		19	259.0	212.7	792	51.1	250.6	209.1	788	57.0	241.5	205.1	783	63.6
		22	281.6	176.6	852	52.1	272.4	173.1	846	58.0	262.3	169.4	839	64.7
12H	24	17	316.5	241.0	979	67.8	306.1	236.3	975	75.6	294.6	231.2	970	84.5
		19	345.4	193.6	1055	69.0	334.1	189.0	1049	77.0	321.6	184.0	1043	85.9
		22	376.1	145.8	1136	70.4	363.8	141.3	1128	78.4	350.3	136.4	1119	87.4
	27	17	317.9	285.1	983	68.0	307.9	280.0	980	75.8	296.8	274.3	977	84.7
		19	345.2	238.4	1055	69.0	333.8	233.7	1049	77.0	321.4	228.6	1042	85.9
		22	375.9	190.4	1135	70.4	363.5	185.9	1127	78.4	350.1	180.9	1118	87.4
	29	17	326.1	319.6	1005	68.3	317.4	311.1	1005	76.1	307.9	301.8	1005	85.2
		19	345.3	282.8	1055	69.0	334.1	278.1	1049	77.0	322.0	272.8	1043	85.9
		22	375.5	234.8	1135	70.4	363.3	230.2	1127	78.4	349.8	225.3	1117	87.4

- Notes:
- 1 All Capacities are gross and do not include fan motor heat gain.
 - 2 Total kW = Total Gross Cooling Capacities
 - 3 Total Sensible kW = Gross Sensible Heat Capacity



Pressure Drop Table

Table 4



Electrical Data

Table 5

Model	Power Supply	Compr.1		Compr.2		Compr.3		Compr.4		Fan Motor @ 400V				Unit MCA	Max Fuse Size & MCB
		RLA _(ARI)	LRA	RLA _(ARI)	LRA	RLA _(ARI)	LRA	RLA _(ARI)	LRA	kW	FLA	LRA	Qty		
WCVS 270	380 - 415 V/ 3 Ph / 50Hz	14.4	130	14.4	130					3.7	7.6	60.0	1	40	54
	Over-Size Fan Mtr-->									5.5	11.50	74.9	1	44	58
WCVS 330	380 - 415 V/ 3 Ph / 50Hz	17.8	135	17.8	135					3.7	7.60	60.0	1	48	65
	Over-Size Fan Mtr-->									7.5	14.50	105.0	1	55	72
WCVS 400	380 - 415 V/ 3 Ph / 50Hz	21.3	175	21.3	175					5.5	11.50	74.9	1	59	81
	Over-Size Fan Mtr-->									11	20.50	145.6	1	68	90
WCVS 470	380 - 415 V/ 3 Ph / 50Hz	17.8	135	17.8	135	14.4	130			5.5	11.50	74.9	1	66	84
	Over-Size Fan Mtr-->									11	20.50	145.6	1	76	132
WCVS 530	380 - 415 V/ 3 Ph / 50Hz	21.3	175	21.3	175	14.4	130			5.5	11.50	74.9	1	74	95
	Over-Size Fan Mtr-->									11	20.50	145.6	1	83	104
WCVS 600	380 - 415 V/ 3 Ph / 50Hz	17.8	135	17.8	135	14.4	130	14.4	130	7.5	14.5	105.0	1	83	101
	Over-Size Fan Mtr-->									15	28.00	195.0	1	99	176
WCVS 660	380 - 415 V/ 3 Ph / 50Hz	17.8	135	17.8	135	17.8	135	17.8	135	7.5	14.50	105.0	1	90	108
	Over-Size Fan Mtr-->									15	28.00	195.0	1	106	183
WCVS 730	380 - 415 V/ 3 Ph / 50Hz	21.3	175	21.3	175	17.8	135	17.8	135	11	20.50	145.6	1	104	125
	Over-Size Fan Mtr-->									15	28.00	195.0	1	113	190
WCVS 800	380 - 415 V/ 3 Ph / 50Hz	21.3	175	21.3	175	21.3	175	21.3	175	11	20.50	145.6	1	111	132
	Over-Size Fan Mtr-->									15	28.00	195.0	1	120	197
WCVS 900	380 - 415 V/ 3 Ph / 50Hz	35	270	35	270	35	270			15	28.00	195.0	1	142	177
	Over-Size Fan Mtr-->									18.5	34.50	215.0	1	148	183
WCVS 12H	380 - 415 V/ 3 Ph / 50Hz	35	270	35	270	35	270	35	270	22	42.00	270.0	1	193	226

As per UL standard.

MCA = Minimum Circuit Ampacity,

MCA = 1.25 LARGEST MOTOR AMP (RLA or FLA) + the SUM OF REMAINING MOTOR AMPS.

RLA_(ARI) = Rated Load Amp at ARI Rating Point, (7.2C Evap / 45C Condensing)

WHEN. Compressor is Largest Load:

MAX FUSE SIZE & MCB = 2.25 * LARGEST COMPR > RLA) + SUM OF REMAINING COMPRESSOR RLA + FAN MOTOR FLA

WHEN. Fan is Largest Load:

MAX FUSE SIZE & MCB = 4.0 (Supply Fan FLA) + COMPRESSOR RLA's

Note: The standard fuse or circuit breaker size selected must be equal to or less than the calculated value.

Also, the selected device rating must be greater than the minimum circuit ampacity.



Mechanical Specification

Unit Casing

The Unit framework shall be 1.9mm ga. GI steel. Exterior panels shall be fabricated from 0.4mm galvanized, 25mm thick double skin, steel ¹. All external panels shall be cleaned and coated with baked polyester powder paint. The compressor base frame shall be welded 2.3 mm galvanized steel. All panels in contact with the air stream shall be insulated with cleanable non hydro-scopic PU insulation, encased together within two GI sheets.

All panels shall be removable with dedicated tools for safety and easy access for servicing and maintenance. The compressor section shall be acoustically insulated with 25mm PU panels as well. The unit base shall be covered with a GI sheet.

Micro Processor Control

The unit shall have a factory installed and tested micro processor controller that enables diagnostics and inbuilt control for compressor sequencing and temperature monitoring and control. Temperature control shall be electronic multi stage control. Lockout safeties are to be provided for each circuit to prevent unsafe compressor operations (manual reset). Remote alarm and diagnostics shall be a standard built in feature for remote monitoring.

Starter

Unit mounted DOL starters shall be standard factory fitted, for compressor and fan startup. All models shall come standard with built-in on-off switches.

Compressors

Units shall have multiple-compressors with independent or manifolded hermetically sealed circuits.

Compressors shall be scrolls of the suction gas cooled type.

Protective devices for high and low pressure cut-outs on each circuit.

Overload for scroll compressors shall be standard.

Models 900 and 12H shall have built in phase reversal protection.

All compressors shall be isolated externally with rubber-in shear isolators.

Refrigerant Circuit

Refrigerant circuits shall be independent or manifolded and shall include pressure access ports (high and low pressure), filter driers and sight glasses. The circuits shall be leak tested and factory charged with R-22. The complete system shall be run tested in the factory.

Condensers

Condensers shall be mechanically cleanable shell and tube². Models 900 and 12H shall have independently circuited tube in tube condensers, with one compressor per condenser, for added reliability.

Water connection location shall be field convertible.

Cooling Coil

The evaporator coil shall be one-half inch or three-eighth inch OD seamless copper tubes mechanically expanded into aluminum fins.

Coils shall have at least two independent circuits for good part load capability (exceptions being 270, 330, 400, with one circuit). Larger units of models 900 and 12H, exceeding 800 MBH shall have 3 or more circuits to ensure best part load capability and servicing. Coils shall be proof tested and leak tested at 300 psig. Thermal expansion device shall be of direct expansion type with external equalizers (capillary tubes shall not be acceptable).

Drain pipe outlet shall be left or right convertible (300-12H). The drain pan shall be of slopping design fabricated of galvanized steel insulated to prevent any condensation and corrosion coated to prevent any corrosion. Suction lines shall be fully insulated.

Fans

Supply fans shall be of double width double inlet forward curved centrifugal fans statically and dynamically balanced. The fans shall be factory run tested. The supply fan motor shall be totally enclosed fan cooled, IP55, with thermal protection.

Notes: 1 Double skin PU insulated units shall have a sandwiched 0.4 galvanized sheet on the outer & inner layers.

2 Models 270-800 Only



Trane

www.trane.com

For more information, contact your local district office

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Stocking Location Malaysia

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.