Appendix A – Chiller Selection

This appendix contains the cut sheets and other data for the manufacturer information provided for the chillers used as a part of the design process. There is data from Trane, Carrier, York, and McQuay included.

Please see the all the chiller information on the following pages.

Centrifugal Chiller

Job Information

Name	**Nathan**	Tag	**CH-1B**
Address		Quantity	**1**
Sales Team	**Washington DC**	Model Number	**CVHE0450**
Comments			

Base unit module

Hot gas by pass	**Without hot gas bypass**	Accessory line item 1	**Accessory line item 1**
Accessory line item 2	**Accessory line item 2**		

General

Manufacturing Facility	**La Crosse**	Agency Listing	**No agency listing (Export use only)**
Motor frequency	**60 Hz**	Motor voltage	**460**
Model	**CVHE**	Compressor size	**450**
Motor size	**231**	Impeller size	**213**
Orifice size	**400**	Distribution	**North America region**
Primary power	**184.30 kW**	Primary efficiency	**0.526 kW/ton**
NPLV	**0.343 kW/ton**	Primary RLA	**257.10 A**
Motor LRA	**2234.00 A**	Min circuit ampacity	**331.00 A**
Max over current protection	**500.00 A**	ARI std 550/590-98 classification	**Certified**
Selection code revision level	**55077.00 Each**	HCFC 123 refrigerant charge	**950.0 lb**
Shipping weight	**19687.0 lb**	Operating weight	**22274.0 lb**
Full load sound pressure	**0 dBA**	IGV position	**90.00 deg**
Compressor speed	**3555 rpm**	ASHRAE 90.1 compliance	**Yes**
Max 90.1 IPLV/NPLV	**0.558 kW/ton**	Max 90.1 efficiency	**0.585 kW/ton**
Green Seal certification	**Yes**	Heat rejected into equip room	**3.15 MBh**
Selection ID	**1111111100.00 Each**		

Evaporator

Cooling capacity	**350.00 tons**	Evap leaving temp	**44.00 F**
Evap flow rate	**696.70 gpm**	Evap flow/capacity	**1.99 gpm/ton**
Evap entering temp	**56.00 F**	Evap fouling factor	**0.00010 hr-sq ft-deg F/Btu**
Evap water box type	**non-marine**	Evap fluid type	**water**
Evap fluid concentration	**0.00 %**	Evap passes	**2**
Evap tube thickness	**0.025"**	Evap tube type	**TECU**
Evap shell size	**050L**	Evap bundle size	**500**
Evap pressure drop	**13.18 ft H2O**	Evap refrig saturation temp	**42.28 F**
Evap fluid velocity	**4.67 ft/s**	Evap min flow rate	**298.40 gpm**

Condenser

Cond entering temp	**85.00 F**	Cond flow rate	**976.80 gpm**
Cond flow/capacity	**2.79 gpm/ton**	Cond leaving temp	**95.00 F**
Cond fouling factor	**0.00025 hr-sq ft-deg F/Btu**	Cond water box type	**non-marine**
Cond fluid type	**water**	Cond fluid concentration	**0.00 %**
Cond tube thickness	**0.028"**	Cond tube type	**TECU**
Cond shell size	**050L**	Cond bundle size	**500**
Cond pressure drop	**19.95 ft H2O**	Cond refrig saturation temp	**96.08 F**
Cond fluid velocity	**6.34 ft/s**	Cond shell construction	**Standard condenser construction**

Starter

AFD model	**AFDE**	AFD frame size	**405 max RLA**
Nameplate power	**184.30 kW**	Nameplate RLA	**257.10 A**
Nameplate MCA	**331.00 A**	Nameplate MOP	**500.00 A**
Adaptive frequency drive	**AFD**		

Submittal Only

Search level	**Comprehensive**	Evap water box pressure	**150 psig evap. water pressure**
Cond water box pressure	**150 psig cond. water pressure**	Evap water box connection	**Victaulic connection evap.**
Cond water box connection	**Victaulic connection cond.**	Evap water box arrgmt	**In RH end - out RH end**
Cond water box arrgmt	**In RH end - out RH end**	Evap water box weld type	**Standard waterbox construction**
Cond water box weld type	**Standard waterbox construction**	Free cooling option	**Without free cooling**
Gas powered chiller	**No gas powered chiller**	Industrial chiller package	**Without industrial chiller package**
Enhanced protection	**Without enhanced protection**		

Settings

Search level	**Comprehensive**	Optimization mode	**kW/TON**
Impeller optimization	**Yes**	Additional condenser	**Without additional condenser**
Application type	**Standard cooling**	Minimum unload point	**25.00 %**
Operating status	**Operating Status**	Trane supplied refrigerant	**Trane Supplied Refrig.**

Test Targets

Factory performance test	**Standard air run and vibration.**

Test Tolerances

Factory tolerance test (SEE NOTES)	**Standard air run and vibration**	Apply special kW/ton tolerance	**No**
Apply special ton tolerance	**No**		

Warranty

Labor 1st year	**1st year labor warranty whole unit**

Evergreen Chiller Performance Outputs

Project Name: Untitled
Sales Office: Philadelphia

03/28/2006
07:14 PM

Tag Name: Selection1

Chiller
- Chiller Model **19XRV2022206BHS64**
- Starter / VFD ..... **VFD - Unit Mounted**
- Refrigerant Type **R-134a**

Cooler
- Size **20**
- Waterbox Type ..... **Nozzle-in-Head, 150 psi**
- Passes **2**
- Tubing ..... **Super E2 (SUPE2), .025 in, Copper**
- Fluid Type ..... **Fresh Water**
- Fouling Factor (hr-sqft-F)/BTU **0.00010**

Compressor
- Size **206**

Flow Controls
- Float Valve Size **3**
- Flasc Orifice **21**

Weights
- Total Rigging Weight ..... **11331** lb
- Total Operating Weight ..... **12829** lb
- Refrigerant Weight ..... **570** lb

Condenser
- Size **22**
- Waterbox Type ..... **Nozzle-in-Head, 150 psi**
- Passes **2**
- Tubing ..... **Spike Fin III (SPK3), .025 in, Copper**
- Fluid Type ..... **Fresh Water**
- Fouling Factor (hr-sqft-F)/BTU **0.00025**

Motor
- Size ..... **BHS**
- Line Voltage/Hertz **460-3-60**

Output Type	Full Load
Percent Load	100.00
Chiller Capacity	350 Tons
Chiller Input kW	231 kW
Chiller Input Power	0.661 kW/Ton
Cooler	
Entering Temp.	54.0 F
Leaving Temp.	44.0 F
Flow Rate	840.0 gpm
Pressure Drop	26.8 ft wg
Condenser	
Leaving Temp.	94.5 F
Entering Temp.	85.0 F
Flow Rate	1050.0 gpm
Pressure Drop	17.4 ft wg
Motor	
Motor Rated Load Amps	341
Motor OLTA	368
Motor LRDA	1732
Chiller Rated Line Amps	319
Chiller Inrush Amps	319
Max Fuse/CB Amps	600
Min Circuit Ampacity	399

Messages:

(1) Certified in accordance with the ARI Water-Chilling Packages using the Vapor Compression Cycle Certification Program, which is based on ARI Standard 550/590-2003.

YORK
A JOHNSON CONTROLS COMPANY

YK MAXE CHILLER
PERFORMANCE SPECIFICATION

Unit Tag	Qty	Model No.	Capacity (tons)	Power	Refrigerant
CH-1,2	2	YKACADQ3-CKF	350	460/3/60	R-134A

Unit Data	Evaporator	Condenser
EWT (°F):	56.00	85.00
LWT (°F):	44.00	94.31
Flow Rate (gpm):	700	1050
Pressure Drop (ft):	11.5	10.9
Fluid Type (%):	WATER	WATER
Circuit No. of Passes:	2	2
Fouling Factor (ft² °F hr / Btu):	0.00010	0.00025
Tube No. / Description:	271 - 0.025" Enhanced Copper	260 - 0.025" CSL Enhanced Copper
Design Working Pressure (psig):	150	150
Entering Water Nozzle @ Location:	C	R
Leaving Water Nozzle @ Location:	B	S
Water Box Weight, ea (lbs) :	209	170
Cover Plate Weight , ea (lbs):	N/A	N/A
Return Head Weight (lbs):	165	132
Water Weight (lbs):	716	848

Performance Data		Electrical Data		Other	
Job KW:	216	Job FLA:	311	Operating Wt. (lbs):	17876
Motor KW:	212	Motor FLA:	301	Per Isolator (lbs):	4469
KW/Ton:	0.617	LRA:	1950	Refrigerant Wt. (lbs):	1250
NPLV (1):	0.381	Inrush Amps:	311	Oil Charge (gal):	10
Shaft HP:	266	Min Circuit Ampacity (Amps):	388	Motor Wt. (lbs):	1460
		Max Fuse/Breaker:	600	Compressor Wt. (lbs):	1807
				Starter Wt. (lbs):	1150
				Shipping Wt. (lbs):	16312
		Type Starter: Variable Speed Drive			

Notes:

(1) Chiller NPLV value calculated to ARI Standard 550/590 equation.

JOB NAME	BJ0652	**REP. OFFICE**	TriState HVAC-York
JOB DESCRIPTION	PSU Project	**SALESMAN**	SW
		CUSTOMER	
MODEL NUMBER	WSC087LBD35R/E2612-BE-2*A/C2612-DLYY-2*AYYY/R134-BAABM		
UNIT TAGGING	CH-1 (350 Ton w/ VFD)	**VERSION**	4.61

GENERAL DATA	
Approval	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)

COMPRESSOR DATA			
Type / quantity-size	Centrifugal / 1 - 087		
Capacity control	VFD	Refrigerant charge (lbs)	891
Refrigerant	R134-a	Oil cooler type	Water cooled

EVAPORATOR DATA		**CONDENSER DATA**	
Flow (US gpm)	700.00	Flow (US gpm)	1050.00
LWT (ºF)	44.00	EWT (ºF)	85.00
Number of passes	2	Number of passes	2
Fouling factor	0.00010	Fouling factor	0.00025
Tube material	Cu	Tube material	Cu
Tube wall thickness (in)	0.025	Tube wall thickness (in)	0.025
Fluid type	Water	Fluid type	Water
Percentage of fluid	100	Percentage of fluid	100

MOTOR / STARTER DATA			
Unit voltage (V/Hz/P)	460 / 60 / 3	MCA (A)	370.9
RLA (amps) per compressor	292	MOCP (A)	516.8
Starter type	VFD	LRA (A) per compressor	2273
Enclosure type	NEMA 1	Model number	VFD047YMW
Location	Terminal mounted	Approval listing	ETL/ETLc Label
Disconnect type	Circuit breaker high interrupt	Motor protection	Standard
Control circuit transformer	Without taps	Surge capacitor	None
Ammeter with selector switch	Yes	Ground fault	No
Voltmeter with selector switch	Yes	Auxiliary control relay	None
Phase / voltage protection	Yes	Indicator lights	None
Lightening arrestors	No	P.F. correction (Kvar)	Inherent
Power factor	0.858	Corrected power factor	0.96
Shipped loose with bracket and cable kit	No	Inrush value	350.26

DESIGN PERFORMANCE											
Capacity (Tons)	Power (kW)	Performance (kW/Ton)	RLA (A)	IPLV\ NPLV (kW/Ton)	75% load (kW/Ton)	50% load (kW/Ton)	25% load (kW/Ton)	Evaporator		Condenser	
								PD (ft)	T in (ºF)	PD (ft)	T out (ºF)
350.0	207.6	0.593	292	0.394	0.444	0.345	0.439	16.0	56.0	16.9	94.2

PART LOAD PERFORMANCE							
P#	%load	Capacity	Input	Perf	RLA	Evaporator	Condenser

	request	(Tons)	power (kW)	(kW/Ton)	(A)	Flow (US gpm)	T in (ºF)	T out (ºF)	PD (ft)	Flow (US gpm)	T in (ºF)	T out (ºF)	PD (ft)
1	100.0	350.0	207.6	0.593	292	700.0	56.0	44.0	16.0	1050.0	85.0	94.2	16.9
2	75.0	262.5	116.6	0.444	187	700.0	53.0	44.0	16.1	1050.0	75.0	81.6	17.6
3	50.0	175.0	60.4	0.345	131	700.0	50.0	44.0	16.1	1050.0	65.0	69.2	18.3
4	25.0	87.5	38.4	0.438	112	700.0	47.0	44.0	16.2	1050.0	65.0	67.1	18.4

SOUND DATA

Sound data (in dB RE 10^{-12} Pa) measured in accordance with ARI 575 (without sound insulation)

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	Overall
69.0	67.0	69.0	71.0	76.0	78.0	78.0	74.0	83.5
							75% load	81.5
							50% load	81.5
							25% load	82.5

SERVICE PERFORMANCE

P#	Refrig Charge (lb)	LRAD (A)	PD capacity	SH	SC	Evaporator			Condenser		
						Temp (ºF)	Pressure (psi)	Velocity (fps)	Temp (ºF)	Pressure (psi)	Velocity (fps)
1	891	2273	1869	1.0	8.5	43.0	38.6	6.3	95.5	115.6	6.8
2	891	2273	1869	1.0	6.5	43.2	38.9	6.3	82.6	91.7	6.8
3	891	2273	1869	1.0	4.4	43.5	39.1	6.3	70.0	71.7	6.8
4	891	2273	1869	1.0	2.3	43.7	39.4	6.3	67.5	68.1	6.8

NOTES:

The ARI 60 hertz Certification Program covers models that:
- are rated up to 2000 tons (7032 kW cooling) at ARI Standard Rating Conditions
- have voltages less than or equal to 5000 volts
- are within the scope of the Application Rating Conditions of ARI Standard 550/590-2003
- have a leaving chilled water temperature of 40 to 48 ºF (4.4 to 8.9 ºC)
- have an entering condenser water temperature of 65 to 105 ºF (18.3 to 40.6 ºC)

The ARI Certification Program specifically excludes:
- chillers above 2000 tons (7032 kW cooling)
- chillers with voltages above 5000 volts
- secondary coolant ratings other than water (e.g. glycol ratings)

Chiller performance is certified in accordance with the latest edition of ARI Standard 550/590-2003.
Above RLA values are per compressor. kW values are total unit kW.

- WSC/WDC063, 079, 087, 100, 113, 126 models utilize water-cooled oil cooler as standard equipment
- WSC/WDC050's utilize a refrigerant-cooled oil cooler as standard equipment.

JOB NAME	BJ0652	**REP. OFFICE**	TriState HVAC-York
JOB DESCRIPTION	PSU Project	**SALESMAN**	SW
		CUSTOMER	
MODEL NUMBER	WDC087LBD35R/E3016-SE-2*A/C3016-SLYY-2*AYYY/R134-BCCCM		
UNIT TAGGING	CH-2 (700 Ton Dual)	**VERSION**	4.61

GENERAL DATA	
Approval	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)

COMPRESSOR DATA			
Type / quantity-size	Centrifugal / 2 - 087		
Capacity control	Inlet guide vanes	Refrigerant charge (lbs)	1936
Refrigerant	R134-a	Oil cooler type	Water cooled

EVAPORATOR DATA		**CONDENSER DATA**	
Flow (US gpm)	1400.00	Flow (US gpm)	2100.00
LWT (ºF)	44.00	EWT (ºF)	85.00
Number of passes	2	Number of passes	2
Fouling factor	0.00010	Fouling factor	0.00025
Tube material	Cu	Tube material	Cu
Tube wall thickness (in)	0.025	Tube wall thickness (in)	0.025
Fluid type	Water	Fluid type	Water
Percentage of fluid	100	Percentage of fluid	100

MOTOR / STARTER DATA			
Unit voltage (V/Hz/P)	460 / 60 / 3	MCA (A)	359.8
RLA (amps) per compressor	283	MOCP (A)	501.3
Starter type	Wye-Delta	LRA (A) per compressor	2273
Enclosure type	NEMA 1 gasketed	Model number	BSRD3WT31
Location	Terminal mounted	Approval listing	CSA ETL
Disconnect type	Circuit breaker	Motor protection	Standard
Control circuit transformer	Without taps	Surge capacitor	Standard
Ammeter with selector switch	None	Ground fault	No
Voltmeter with selector switch	None	Auxiliary control relay	None
Phase / voltage protection	Yes	Indicator lights	None
Lightening arrestors	No	P.F. correction (Kvar)	None
Power factor	0.894	Corrected power factor	None
Shipped loose with bracket and cable kit	No		

DESIGN PERFORMANCE											
Capacity (Tons)	Power (kW)	Performance (kW/Ton)	RLA (A)	IPLV\ NPLV (kW/Ton)	75% load (kW/Ton)	50% load (kW/Ton)	25% load (kW/Ton)	Evaporator		Condenser	
								PD (ft)	T in (ºF)	PD (ft)	T out (ºF)
700.0	403.0	0.576	283	0.443	0.515	0.375	0.537	21.3	56.0	23.8	94.2

PART LOAD PERFORMANCE													
P#	%load request	Capacity (Tons)	Input power (kW)	Perf (kW/Ton)	RLA (A)	Evaporator				Condenser			
						Flow (US gpm)	T in (ºF)	T out (ºF)	PD (ft)	Flow (US gpm)	T in (ºF)	T out (ºF)	PD (ft)

(CH-1A)

1	100.0	700.0	403.0	0.576	283	1400.0	56.0	44.0	21.3	2100.0	85.0	94.2	23.8
2	75.0	525.0	270.2	0.515	204	1400.0	53.0	44.0	21.4	2100.0	75.0	81.8	24.7
3	50.0	350.0	131.4	0.375	201	1400.0	50.0	44.0	21.5	2100.0	65.0	69.4	25.8
4	25.0	175.0	94.0	0.537	161	1400.0	47.0	44.0	21.6	2100.0	65.0	67.2	25.9

SOUND DATA

Sound data (in dB RE 10^{-12} Pa) measured in accordance with ARI 575 (without sound insulation)

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	Overall
69.0	68.0	70.0	74.0	78.0	81.0	81.0	77.0	86.5
							75% load	84.5
							50% load	80.5
							25% load	79.5

SERVICE PERFORMANCE

P#	Refrig Charge (lb)	LRAD (A)	PD capacity	SH	SC	Evaporator			Condenser		
						Temp (ºF)	Pressure (psi)	Velocity (fps)	Temp (ºF)	Pressure (psi)	Velocity (fps)
1	1936	2273	2751	1.0	8.3	42.5	38.1	6.3	95.1	114.8	7.0
2	1936	2273	2751	1.0	6.5	42.5	38.1	6.3	82.5	91.5	7.0
3	1936	2273	2751	1.0	3.9	43.8	39.4	6.3	69.7	71.4	7.0
4	1936	2273	2751	1.0	2.2	43.9	39.5	6.3	67.4	68.0	7.0

NOTES:

The ARI 60 hertz Certification Program covers models that:

- are rated up to 2000 tons (7032 kW cooling) at ARI Standard Rating Conditions
- have voltages less than or equal to 5000 volts
- are within the scope of the Application Rating Conditions of ARI Standard 550/590-2003
- have a leaving chilled water temperature of 40 to 48 ºF (4.4 to 8.9 ºC)
- have an entering condenser water temperature of 65 to 105 ºF (18.3 to 40.6 ºC)

The ARI Certification Program specifically excludes:

- chillers above 2000 tons (7032 kW cooling)
- chillers with voltages above 5000 volts
- secondary coolant ratings other than water (e.g. glycol ratings)

Chiller performance is certified in accordance with the latest edition of ARI Standard 550/590-2003.
Above RLA values are per compressor. kW values are total unit kW.

- WSC/WDC063, 079, 087, 100, 113, 126 models utilize water-cooled oil cooler as standard equipment
- WSC/WDC050's utilize a refrigerant-cooled oil cooler as standard equipment.

JOB NAME	BJ0652	**REP. OFFICE**	TriState HVAC-York
JOB DESCRIPTION	PSU Project	**SALESMAN**	SW
		CUSTOMER	
MODEL NUMBER	WDC087LBD35R/E3016-SE-2*A/C3016-SLYY-2*AYYY/R134-BCCCM		
UNIT TAGGING	CH-3 (700 Ton Dual VFD)	**VERSION**	4.61

GENERAL DATA	
Approval	ETL Listed / ETL Listed to Canadian Safety Standards (ETL Label / ETLc Label)

COMPRESSOR DATA			
Type / quantity-size	Centrifugal / 2 - 087		
Capacity control	VFD	Refrigerant charge (lbs)	1936
Refrigerant	R134-a	Oil cooler type	Water cooled

EVAPORATOR DATA		**CONDENSER DATA**	
Flow (US gpm)	1400.00	Flow (US gpm)	2100.00
LWT (ºF)	44.00	EWT (ºF)	85.00
Number of passes	2	Number of passes	2
Fouling factor	0.00010	Fouling factor	0.00025
Tube material	Cu	Tube material	Cu
Tube wall thickness (in)	0.025	Tube wall thickness (in)	0.025
Fluid type	Water	Fluid type	Water
Percentage of fluid	100	Percentage of fluid	100

MOTOR / STARTER DATA			
Unit voltage (V/Hz/P)	460 / 60 / 3	MCA (A)	373.2
RLA (amps) per compressor	294	MOCP (A)	520.1
Starter type	VFD	LRA (A) per compressor	2273
Enclosure type	NEMA 1	Model number	VFD047YMW
Location	Terminal mounted	Approval listing	ETL/ETLc Label
Disconnect type	Circuit breaker high interrupt	Motor protection	Standard
Control circuit transformer	Without taps	Surge capacitor	None
Ammeter with selector switch	Yes	Ground fault	No
Voltmeter with selector switch	Yes	Auxiliary control relay	None
Phase / voltage protection	Yes	Indicator lights	None
Lightening arrestors	No	P.F. correction (Kvar)	Inherent
Power factor	0.859	Corrected power factor	0.96
Shipped loose with bracket and cable kit	No	Inrush value	352.55

DESIGN PERFORMANCE											
Capacity (Tons)	Power (kW)	Performance (kW/Ton)	RLA (A)	IPLV\ NPLV (kW/Ton)	75% load (kW/Ton)	50% load (kW/Ton)	25% load (kW/Ton)	Evaporator		Condenser	
								PD (ft)	T in (ºF)	PD (ft)	T out (ºF)
700.0	418.2	0.597	294	0.386	0.451	0.355	0.318	21.3	56.0	23.8	94.2

PART LOAD PERFORMANCE							
P#	%load	Capacity	Input	Perf	RLA	Evaporator	Condenser

	request	(Tons)	power (kW)	(kW/Ton)	(A)	Flow (US gpm)	T in (ºF)	T out (ºF)	PD (ft)	Flow (US gpm)	T in (ºF)	T out (ºF)	PD (ft)
1	100.0	700.0	418.2	0.597	294	1400.0	56.0	44.0	21.3	2100.0	85.0	94.2	23.8
2	75.0	525.0	236.7	0.451	189	1400.0	53.0	44.0	21.4	2100.0	75.0	81.6	24.7
3	50.0	350.0	124.2	0.355	133	1400.0	50.0	44.0	21.5	2100.0	65.0	69.3	25.8
4	25.0	175.0	55.7	0.318	127	1400.0	47.0	44.0	21.6	2100.0	65.0	67.1	25.9

SOUND DATA

Sound data (in dB RE 10^{-12} Pa) measured in accordance with ARI 575 (without sound insulation)

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	Overall
69.0	68.0	70.0	74.0	78.0	81.0	81.0	77.0	86.5
							75% load	84.5
							50% load	80.5
							25% load	79.5

SERVICE PERFORMANCE

P#	Refrig Charge (lb)	LRAD (A)	PD capacity	SH	SC	Evaporator			Condenser		
						Temp (ºF)	Pressure (psi)	Velocity (fps)	Temp (ºF)	Pressure (psi)	Velocity (fps)
1	1936	2273	2751	1.0	8.2	42.5	38.1	6.3	95.1	114.8	7.0
2	1936	2273	2751	1.0	6.4	42.5	38.1	6.3	82.3	91.2	7.0
3	1936	2273	2751	1.0	4.3	42.4	38.0	6.3	69.8	71.4	7.0
4	1936	2273	2751	1.0	2.1	43.9	39.5	6.3	67.3	67.8	7.0

NOTES:

The ARI 60 hertz Certification Program covers models that:
- are rated up to 2000 tons (7032 kW cooling) at ARI Standard Rating Conditions
- have voltages less than or equal to 5000 volts
- are within the scope of the Application Rating Conditions of ARI Standard 550/590-2003
- have a leaving chilled water temperature of 40 to 48 ºF (4.4 to 8.9 ºC)
- have an entering condenser water temperature of 65 to 105 ºF (18.3 to 40.6 ºC)

The ARI Certification Program specifically excludes:
- chillers above 2000 tons (7032 kW cooling)
- chillers with voltages above 5000 volts
- secondary coolant ratings other than water (e.g. glycol ratings)

Chiller performance is certified in accordance with the latest edition of ARI Standard 550/590-2003.
Above RLA values are per compressor. kW values are total unit kW.

- WSC/WDC063, 079, 087, 100, 113, 126 models utilize water-cooled oil cooler as standard equipment
- WSC/WDC050's utilize a refrigerant-cooled oil cooler as standard equipment.

Proposal

Trane
A Division of American Standard Inc.

Prepared For:
M.Contractor: Southland Industries

Date: March 31, 2006

Proposal Number: E2-68290-1

Job Name:
Nathan

Engineer:
Southland Industries
22960 Shaw Road
Suite 800
Sterling, VA 20166

Delivery Terms:
Freight Allowed and Prepaid - F.O.B. Factory

Payment Terms:
Net 30 Days

Trane is pleased to provide the enclosed proposal for your review and approval.

Tag Data - Centrifugal Water Chillers (Qty: 4)

Item	Tag(s)	Qty	Description	Model Number
A1	CH-1A	1	Centrifugal Chiller (CTV)	CVHE0450
A2	CH-1B	1	Centrifugal Chiller (CTV)	CVHE0450
A3	CH-2A	1	Centrifugal Chiller (CTV)	CVHE0450
A4	CH-2B	1	Centrifugal Chiller (CTV)	CVHE0450

Product Data - Centrifugal Water Chillers

All Units

North America region
Centrifugal liquid chiller with 3 stage compressor R-123 refrigerant
Compressor size: 450 nominal tons
Without industrial chiller package
Compressor hertz: 60
Compressor voltage: 460 volt 3 phase
Compressor impeller cutback: 213
Standard cooling
Evaporator shell size: 050 long
Evaporator bundle size: 500 nominal tons
Evaporator tubes: 0.75 inch (19.1 mm) dia. internally enhanced copper
Evaporator tube wall: .025 inch (0.6 mm) thick
Evaporator fluid type: Water
Evaporator waterbox type: Non-marine
Evaporator waterbox construction: Standard
Evaporator waterbox passes: Two pass
Evaporator waterbox pressure: 150 psig (1034 kPa)
Evaporator waterbox connection: Victaulic
Evaporator waterbox arrangement: in RH end - out RH end
Condenser shell size: 050 long
Condenser bundle size: 500 nominal tons
Condenser tube: 0.75 inch (19.1 mm) internally enhanced copper
Condenser tube wall: .028 inch (0.7 mm) thick
Condenser shell construction: Standard

Condenser fluid type: Water
Condenser waterbox type: 2 pass non-marine
Condenser waterbox construction: Standard
Condenser waterbox pressure: 150 psig (1034 kPa)
Condenser waterbox connection: Victaulic
Condenser waterbox arrangement: in RH end - out RH end
Orifice size: 400 nominal tons
Factory performance test: Standard air run and vibration test
Factory tolerance test: Standard air run and vibration test
Don't apply special ton tolerance
Don't apply special kW/ton tolerance
Complies with all versions of ASHRAE/IESNA 90.1
Operating Status
Without enhanced protection
Accessory line item 1
Accessory line item 2
Trane Supplied Refrigerant
1st Year Labor Warranty Whole Unit with Trane Supplied Starter

Item: A1, A3 Qty: 2 Tag(s): CH-1A, CH-2A

60 hz Compressor motor power: 204 kW
Green Seal not qualified
Low Voltage Wye-Delta Starters
Starter type: Unit Mounted Wye-Delta
Starter maximum RLA: 346 Amps
Starter power connection: Non-fused Disconnect Switch
Starter power connection maximum RLA: 296 Amps

Item: A2, A4 Qty: 2 Tag(s): CH-1B, CH-2B

60 hz Compressor motor power: 231 kW
Green Seal certified
Refrigerant Cooled AFD CH530 Development
Unit mounted adaptive frequency drive
Adaptive frequency drive maximum RLA: 405 amps

Total Net Price CH-1A *(Excluding Sales Tax)* .....$ 114,518.00
Total Net Price CH-1B *(Excluding Sales Tax)* .....$ 137,186.00
Total Net Price CH-2A *(Excluding Sales Tax)* .....$ 114,518.00
Total Net Price CH-2B *(Excluding Sales Tax)* .....$ 137,186.00

Trane is pleased to offer you an opportunity to maximize the value of your purchase by offering you *savings* with the Anticipation Discount Program (ADP). Contact your Trane representative for more details or an ADP discount calculation.

Sincerely,

Jim Fusco - Trane
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Rockville, MD 20852-1726
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