ELECTRIC BOILERS

UNIT NUMBER	LOCATION	ELECTRIC ELEMENT DATA						PRESSURE RATING (PSI)	MAX ALLOWABLE WORKING TEMP (°F)	RELIEF VALVE (°F)	ELECTRICAL @ 60 HZ					BASIS OF DESIGN MANUFACTURER AND MODEL	FLOW @ GROSS OUTPUT			NOTES SEE BELOW	EMER POWER
		RATED (KW)	OUTPUT (MBH)	ELEMENTS (QTY)	KW PER ELEMENT	CONTACTORS (QTY)	STEPS (NUMBER, KW)				AMP	RPM	V	]	MOTOR (HP)		GPM	EWT (°F)	LWT (°F)		
BHW-1	CENTRAL PLANT	810	2764	81	10	27	7 @ 90, 3 @ 60	160	250	250	976	-	460	3	-	CLEAVER BROOKS WB-242	185	100	130	1,2,3,4,5,6,7,8	YES
BHW-2	CENTRAL PLANT	810	2764	81	10	27	7 @ 90, 3 @ 60	160	250	250	976	-	460	3	-	CLEAVER BROOKS WB-242	185	100	130	1,2,3,4,5,6,7,8	YES

GENERAL NOTES

1. DIGITAL LOAD MONITORING FOR VOLTS,AMPS AND POWER.
2. FACTORY MOUNTED CIRCUIT BREAKER
3. 100KA SCCR RATING
4. TOUCHSCREEN DIGITAL PROCESS CONTROLLER
5. SCR STEP CONTROLLER
6. LEAD/LAG CONTROLLER
7. PROTOCAL TRANSLATOR (BACNET
8. AUTOMATIC ISOLATION VALVES
9. EQUIPMENT TO BE OWNER PURCHASED, SHIPPED DIRECT TO PREFABRICATED PLANT MANUFACTURER (EPSILON), AND INSTALLED BY EPSILON IN FACTORY.

GENERAL NOTES

1. SAND FILTRATION AND ASSOCIATED PUMPS PROVIDED BY PREFABRICATED PLANT MANUFACTURER.
2. UNLESS OTHERWISE NOTED, ALL EQUIPMENT TAGS ON THIS DRAWING ARE PRECEDED BY CR-01-
3. CHILLER AND BOILER EQUIPMENT EXCEEDS THE MINIMUM NYS ENERGY CODE REQUIREMENTS BY 10% PER 406.1.1 AND 406.2.

WATER COOLED MAGNETIC BEARING CENTRIFUGAL CHILLERS

UNIT NUMBER	LOCATION	OPERATION	NOMINAL COOLING TONS	ELECTRICAL DATA			EVAPORATOR								CONDENSER								COMPRESSOR				DIMENSIONS				BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES SEE BELOW	EMER POWER
				VOLTS (3Φ)	MAX. CIRC. AMP.	MAX INPUT (KW)	SOURCE	CAPACITY (TONS)	EWT (°F)	LWT (°F)	GPM	FLUID	# OF PASSES	Δ PRESS FT. H2O	FOULING FACTOR	SOURCE	CAPACITY (MBH)	EWT (°F)	LWT (°F)	GPM	FLUID	# OF PASSES	Δ PRESS FT. H2O	FOULING FACTOR	QTY	STAGES UNLOAD. (TOT)	KW RATING (EA)	KW/TON MAX	L (IN)	W (IN)	H (IN)	OPERATING WEIGHT (LBS)			
CH-1	CENTRAL PLANT	CT COOLING	400	460	403	240	CHW	370	56	40	570	20% PG	2	5.0	0.00010	CW	5272	82	97	723	20% PG	2	13.0	0.00025	1	2	240	0.676	130	71	77	17350	TRANE AGILITY	1, 2, 3	YES
		SIMULTANEOUS HEAT & COOL			656	403	CHW	350	56	40	540			5.0		HW	5551	114	130	694			7.4				403	1.156							
		GEO COOLING			423	251	CHW	370	56	40	570			5.0		GEO. WF.	5252	88	94	1751			46.0				251	0.660							
		GEO HEATING			560	335	GEO. WF.	270	35	29	1105			16.9		HW	4391	111	124	676			5.4				335	1.259							
CH-2	CENTRAL PLANT	CT COOLING	400	460	403	240	CHW	370	56	40	570	20% PG	2	5.0	0.00010	CW	5272	82	97	723	20% PG	2	13.0	0.00025	1	2	240	0.676	130	71	77	17350	TRANE AGILITY	1, 2, 3	YES
		SIMULTANEOUS HEAT & COOL			656	403	CHW	350	56	40	540			5.0		HW	5551	114	130	694			7.4				403	1.156							
		GEO COOLING			423	251	CHW	370	56	40	570			5.0		GEO. WF.	5252	87	94	1751			46.0				251	0.660							
		GEO HEATING			560	335	GEO. WF.	270	35	29	1105			16.9		HW	4391	111	124	676			5.4				335	1.259							
CH-3	CENTRAL PLANT	CT COOLING	400	460	403	240	CHW	370	56	40	570	20% PG	2	5.0	0.00010	CW	5272	82	97	723	20% PG	2	13.0	0.00025	1	2	240	0.676	130	71	77	17350	TRANE AGILITY	1, 2, 3	YES
		SIMULTANEOUS HEAT & COOL			656	403	CHW	350	56	40	540			5.0		HW	5551	114	130	694			7.4				403	1.156							
		GEO COOLING			423	251	CHW	370	56	40	570			5.0		GEO. WF.	5252	87	94	1751			46.0				251	0.660							
		GEO HEATING			560	335	GEO. WF.	270	35	29	1105			16.9		HW	4391	111	124	676			5.4				335	1.259							
CH-4	CENTRAL PLANT	CT COOLING	400	460	403	240	CHW	370	56	40	570	20% PG	2	5.0	0.00010	CW	5272	82	97	723	20% PG	2	13.0	0.00025	1	2	240	0.676	130	71	77	17350	TRANE AGILITY	1, 2, 3	YES
		SIMULTANEOUS HEAT & COOL			656	403	CHW	350	56	40	540			5.0		HW	5551	114	130	694			7.4				403	1.156							
		GEO COOLING			423	251	CHW	370	56	40	570			5.0		GEO. WF.	5252	87	94	1751			46.0				251	0.660							
		GEO HEATING			560	335	GEO. WF.	270	35	29	1105			16.9		HW	4391	111	124	676			5.4				335	1.259							

GENERAL NOTES

1. BASIS OF DESIGN IS TRANE AGILITY. SEE SPECIFICATIONS SECTION 23 64 16.
2. PROVIDE WITH A UNIT MOUNTED VFD.
3. CHILLER SHALL BE CAPABLE OF OPERATING WITH 50% FLOW RATE THROUGH THE EVAPORATOR.
4. EQUIPMENT TO BE OWNER PURCHASED, SHIPPED DIRECT TO PREFABRICATED PLANT MANUFACTURER (EPSILON), AND INSTALLED BY EPSILON IN FACTORY.

WATER COOLED HELICAL ROTARY (SCREW) CHILLERS

UNIT NUMBER	LOCATION	REFR TYPE	# OF CIRCUITS	REFR CHARGE PER CIRCUIT (LBS)	UNIT COOLING CAPACITY (TONS)	OPERATION	COLD SIDE (EVAPORATOR)										HOT SIDE (CONDENSER)										COMPRESSOR (TOTAL)							ELECTRICAL (TOTAL)					SPEED CONTROL	DIMENSIONS				BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES	EMER POWER
							SOURCE	CAPACITY (TONS)	EWT (°F)	LWT (°F)	DESIGN GPM	FLUID	# OF PASSES	RATING PSIG	FOULING FACTOR	Δ PRESS FT. H2O	SOURCE	CAPACITY (MBH)	EWT (°F)	LWT (°F)	DESIGN GPM	FLUID	# OF PASSES	RATING PSIG	FOULING FACTOR	Δ PRESS FT. H2O	QTY	NUMBER OF CIRCUITS	COOLING EFFICIENCY (KW/TON)	HEATING EFFICIENCY (COP)	NPLV (KW/TON)	KW	V.-HZ	TOTAL POWER (KW)	MCA	MOCP		L (IN)	W (IN)	H (IN)	OPERATING WEIGHT (LBS)			
CH-5	CENTRAL PLANT	R-134A	2	180.8	250	SIMULTANEOUS HEAT & COOL	CHW	152.0	55	40	251	20% PG				5	HW	2575	114	130	330	20% PG				3.9			1.45	3.42	0.627	201												
		HEATING ONLY					GEO. WF.	127.7	35	29	530	20% PG	2	150	0.00010	16.0	HW	2229	111	124	350	20% PG	2	150	0.00025	5.0	2	2	1.6	3.20	0.627	231	460-3-60	-	329	450	VARIABLE	136	48	77	10,100	TRANE RTWD250	SEE BELOW	YES
		COOLING ONLY					CHW	200.3	56	40	310	20% PG				6	GEO. WF.	2982	88	94	1010	20% PG				32.0			0.85	5.16	0.685	152												
CH-6	CENTRAL PLANT	R-134A	2	180.8	250	SIMULTANEOUS HEAT & COOL	CHW	152.0	55	40	251	20% PG				5	HW	2575	114	130	330	20% PG				3.9			1.45	3.42	0.627	201												
		HEATING ONLY					GEO. WF.	127.7	35	29	530	20% PG	2	150	0.00010	16.0	HW	2229	111	124	350	20% PG	2	150	0.00025	5.0	2	2	1.6	3.20	0.627	231	460-3-60	-	329	450	VARIABLE	136	48	77	10,100	TRANE RTWD250	SEE BELOW	YES
		COOLING ONLY					CHW	200.3	56	40	310	20% PG				6	GEO. WF.	2982	88	94	1010	20% PG				32.0			0.85	5.16	0.685	152												
CH-7	CENTRAL PLANT	R-134A	2	180.8	250	SIMULTANEOUS HEAT & COOL	CHW	152.0	57	42	251	20% PG				5	HW	2575	114	130	330	20% PG				3.9			1.45	3.42	0.627	201												
		HEATING ONLY					GEO. WF.	127.7	35	29	530	20% PG	2	150	0.00010	16.0	HW	2229	111	124	350	20% PG	2	150	0.00025	5.0	2	2	1.6	3.20	0.627	231	460-3-60	-	329	450	VARIABLE	136	48	77	10,100	TRANE RTWD250	SEE BELOW	YES
		COOLING ONLY					CHW	200.3	58	42	310	20% PG				6	GEO. WF.	2982	88	94	1010	20% PG				32.0			0.85	5.16	0.685	152												

GENERAL NOTES

1 VENDOR SHALL BE RESPONSIBLE FOR THE REFRIGERANT CHARGE AS WELL AS FIELD INSPECTION AND TESTING AFTER...
2. EQUIPMENT TO BE OWNER PURCHASED, SHIPPED DIRECT TO PREFABRICATED PLANT MANUFACTURER (EPSILON), AND INSTALLED BY EPSILON IN FACTORY.

COOLING TOWERS

UNIT NUMBER	LOCATION	NOM. TONS	EWT (°F)	LWT (°F)	EAT (°F WB)	GPM	OPEN LIFT (FT)	NOZZLE PRESS.	QTY. OF FANS	MOTOR DATA @ 60 HZ							SOUND DATA (DISCHARGE)								SOUND DATA (AIR INLET)								SOUND DATA (CASED FACE)								MAXIMUM DIMENSIONS (L x W x H)	OPERATING WEIGHT (LB)	BASIS OF DESIGN MANUFACTURER AND MODEL	NOTES SEE BELOW	EMER POWER
										BHP	MHP	RPM	SPEEDS	REVERS.	VOLTS	PHASE	63 HZ	125 HZ	250 HZ	500 HZ	1K HZ	2K HZ	8K HZ	OVERALL DBA	63 HZ	125 HZ	250 HZ	500 HZ	1K HZ	2K HZ	8K HZ	OVERALL DBA	63 HZ	125 HZ	250 HZ	500 HZ	1K HZ	2K HZ	8K HZ	OVERALL DBA					
CT-1	CENTRAL PLANT	400	97	82	76	756	12	-	1	20	20	1,800	VARIABLE	NO	460	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11'-10" x 21'-7" x 12'-1"	26,510	BAC XES3E-1222-07M ENDURA	1 - 9	YES
CT-2	CENTRAL PLANT	400	97	82	76	756	12	-	1	20	20	1,800	VARIABLE	NO	460	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11'-10" x 21'-7" x 12'-1"	26,510	BAC XES3E-1222-07M ENDURA	1 - 9	YES

GENERAL NOTES

1. BASIS OF DESIGN IS BAC XES3E-1222-07M ENDURA. SEE SPECIFICATIONS SECTION 23 65 00.
2. COOLING TOWER SHALL BE CONSTRUCTED ENTIRELY OF SERIES 300 STAINLESS STEEL, AND CARRY A MINIMUM 5-YEAR MANUFACTURER WARRANTY.
3. PROVIDE TEFC MOTOR AND VFD (BACNET) FOR EACH FAN MOTOR.
4. PROVIDE 12 KW ELECTRIC BASIN HEATER PER CELL.
5. PROVIDE BOTTOM INLET AND BOTTOM OUTLET. OUTLET SHALL HAVE A SUMP BOX.
6. PROVIDE MECHANICAL ACCESS DOOR PLTAFORM, GUARDRAIL, AND LADDER.
7. PROVIDE SOLID STATE WATER LEVEL CONTROL PACKAGE, EXTENDER GEAREDUCER OIL LINE, AND AIR INLET SCREENS.
8. ACOUSTIC PERFORMANCE SHALL BE GUARANTEED AND A FIELD SOUND TEST SHALL BE CONDUCTED ON-SITE AFTER INSTALALTION.
9. EQUIPMENT TO BE OWNER PURCHASED, SHIPPED DIRECT TO PREFABRICATED PLANT MANUFACTURER (EPSILON), AND INSTALLED BY EPSILON IN FACTORY.

Prepared by Owner's on-staff Design professionals

Watchtower Bible and Tract Society of New York, Inc.
900 Red Mills Road
Wallkill, NY, 12589-3299
Tel: 1 (845) 306-3330
InboxHPR.US@jw.org

BR+A
105 Madison Ave
10th Floor
New York, NY 10016
www.brplusa.com

HPR headquarters project | ramapo

JW.ORG

REV	DATE	DESCRIPTION	ISS
9	10.25.22	INFORMATION	JB
8	09.29.22	INFORMATION	JB
7	08.05.22	SUBMISSION	JB
6	11.08.21	INFORMATION	AJT
5	09.07.21	INFORMATION	AJT
4	04.07.21	INFORMATION	AJT
3	02.16.21	INFORMATION	AJT
2	12.01.20	INFORMATION	JF

Title: EQUIPMENT SCHEDULES

Project: CENTRAL ENERGY PLANT
Address: 155 STERLING MINE ROAD
SLOATSBURG, NY 10974

Project no. 19009 Revision P9

Sheet M-602

D-1

EXPANSION TANKS

UNIT NUMBER	LOCATION	SYSTEM SERVED	FLUID	SYSTEM APPROX. VOLUME (GALLONS)	TEMP. RANGE		TANK PRESSURE		TANK CAPACITY (GALLONS)	STYLE	TANK LEN. X DIA. (IN. X IN.)	TANK FITTING SIZE (IN.)	RELIEF VALVE SETTING (PSIG)	FILL VALVE SETTING (PSIG)	BASIS OF DESIGN	NOTES SEE BELOW
					MIN TEMP. (°F)	MAX TEMP. (°F)	MIN PRESS. (PSIG)	MAX PRESS. (PSIG)								
TEX-1	CENTRAL PLANT	PLANT CHILLED GLYCOL	20% PROPYLENE GLYCOL	15,000	40	80	15	100	57	VERTICAL	20 X 64	2.0	125	-	ARMSTRONG	1
TEX-2	CENTRAL PLANT	PLANT HOT GLYCOL	20% PROPYLENE GLYCOL	15,000	60	130	15	80	264	VERTICAL	36 X 80	2.0	125	-	ARMSTRONG	1
TEX-3	CENTRAL PLANT	GEO. WELLFIELD	20% PROPYLENE GLYCOL	6,000	35	50	10	125	44	VERTICAL	20 X 39	1.0	125	-	ARMSTRONG	1
TEX-4	CENTRAL PLANT	COOLING TOWER HX	20% PROPYLENE GLYCOL	6,000	60	100	15	100	57	VERTICAL	20 X 64	1.0	125	-	ARMSTRONG	1
TEX-5	CENTRAL PLANT	CAMPUS CHW	WATER	75,000	42	80	20	100	290	VERTICAL	30 X 80	2.0	125	-	ARMSTRONG	1
TEX-6	CENTRAL PLANT	CAMPUS HW	WATER	75,000	60	130	15	115	1320	VERTICAL	54 X 153	2.0	125	-	ARMSTRONG	1

GENERAL NOTES

1. EQUIPMENT TO BE PURCHASED AND FACTORY INSTALLED BY THE PREFABRICATED PLANT MANUFACTURER (EPSILON).

GENERAL NOTES

1. SAND FILTRATION AND ASSOCIATED PUMPS PROVIDED BY PREFABRICATED PLANT MANUFACTURER.
2. UNLESS OTHERWISE NOTED, ALL EQUIPMENT TAGS ON THIS DRAWING ARE PRECEDED BY CP-01-
3. CHILLER AND BOILER EQUIPMENT EXCEEDS THE MINIMUM NYS ENERGY CODE REQUIREMENTS BY 10% PER 406.1.1 AND 406.2.

PLATE AND FRAME HEAT EXCHANGERS

UNIT NUMBER	LOCATION	SYSTEM SERVED	MIN. NO. OF PLATES	MODE	CAPACITY (MBH)	SIDE A (SOURCE)								SIDE B (SERVICE)								MATERIAL	MIN. SURFACE AREA (SQ. FT.)	DIMENSIONS L X H X W (IN. X IN. X IN.)	BASIS OF DESIGN	NOTES
						EWT (°F)	LWT (°F)	GPM	Δ PSIG	FLUID	FOULING FACTOR	PRES. RATING (PSIG)	INLET/ OUTLET (IN.)	EWT (°F)	LWT (°F)	GPM	Δ PSIG	FLUID	FOULING FACTOR	PRES. RATING (PSIG)	INLET/ OUTLET (IN.)					
HX-1,2	CENTRAL PLANT	CT CW	280	CT COOLING	5,680	85	100	760	3.7	WATER	0.00025	150	8/8	98	83	783	3.7	20% PG	0.0001	150	8/8	AISI304	2,603	81 X 85 X 26	BELL & GOSSETT	SEE BELOW
HX-3,4	CENTRAL PLANT	CAMPUS CHW	783	CT COOLING	12,480	40	56	1605	2.0	20% PG	0.0001	150	12/12	58	42	1605	1.6	WATER	0.0001	150	12/12	AISI304	16,477	196 X 119 X 40	BELL & GOSSETT	SEE BELOW
				CH SIMULTANEOUS HEAT & COOL	11,656	40	56	1457	1.8					58	42	1457	1.4									
				GEO COOLING	12,480	40	56	1605	2.0					58	42	1605	1.6									
HX-5,6	CENTRAL PLANT	CAMPUS HW	370	CH SIMULTANEOUS HEAT & COOL	18,000	130	114	2260	2.1	20% PG	0.0001	150	12/12	95	125	1200	0.6	WATER	0.0001	150	12/12	AISI304	4,060	119 X 78 X 40	BELL & GOSSETT	SEE BELOW
				GEO HEATING	14,630	124	111	2251	2.1					95	122	1084	0.5									
HX-7	CENTRAL PLANT	DOMESTIC HW	13	ALL	400	125	95	28	6.0	20% PG	0.0001	150	2.5/2.5	40	120	10	0.6	WATER	0.00025	150	2.5/2.5	AISI304	26	16 X 45 X 18	BELL & GOSSETT	SEE BELOW

GENERAL NOTES

1. PROVIDE WITH PERMANENT INSULATION JACKET FROM MFG.
2. PROVIDE WITH CLEAN IN PLACE CONNECTIONS.
3. ALL HEAT EXCHANGERS SHALL BE TESTED TO AHRI 400 REQUIREMENTS.
4. EQUIPMENT TO BE PURCHASED AND FACTORY INSTALLED BY THE PREFABRICATED PLANT MANUFACTURER (EPSILON).
5. HX-3,4 SIZED TO SATISFY 50% OF THE TOTAL COOLING LOAD EACH. HX-5,6 SIZED TO SATISFY 60% OF THE TOTAL HEATING LOAD EACH.

PUMPS

UNIT NUMBER	LOCATION	SYSTEM SERVED	TYPE	FLUID	GPM	EST. TOTAL HEAD (FT. W.C.)	NPSH REQ.	VFD	MOTOR DATA @ 60 HZ					BASIS OF DESIGN	NOTES	EMER POWER
									BHP	MHP	RPM	VOLTS	PHASE			
PHW-1,2,3	CENTRAL PLANT	PLANT HW	VERTICAL	20% PG	1,510	65	-	YES	29.2	40	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PHW-4,5,6	CENTRAL PLANT	CAMPUS HW	VERTICAL	WATER	800	130	-	YES	31.9	40	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PHW-7,8,9	CENTRAL PLANT	CH-5,6,7	VERTICAL	20% PG	1,010	50	-	YES	15.1	20	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PHW-10,11	CENTRAL PLANT	BLR-1,2	VERTICAL	20% PG	185	20	-	YES	1.2	1.5	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PCW-1,2,3	CENTRAL PLANT	PLANT CHW	VERTICAL	20% PG	1,284	50	-	YES	19.9	25	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PCW-4,5,6	CENTRAL PLANT	CAMPUS CHW	VERTICAL	WATER	1,284	120	-	YES	49.6	60	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PCW-7,8,9	CENTRAL PLANT	CH-5,6,7	VERTICAL	20% PG	530	25	-	YES	4.4	7.5	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PWE-1,2,3	CENTRAL PLANT	GEO. WELLFIELD	VERTICAL	20% PG	3,084	120	-	YES	114.1	150	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PCW-10,11,12,13	CENTRAL PLANT	CH-1,2,3,4 CHW	VERTICAL	20% PG	1,105	40	-	YES	14.0	20	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PCR-1,2,3,4	CENTRAL PLANT	CH-1,2,3,4 HW	VERTICAL	20% PG	1,545	50	-	YES	24.3	30	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PCR-5,6	CENTRAL PLANT	CH-1,2,3,4 CW	VERTICAL	20% PG	780	40	-	YES	9.7	15	1,800	460	3	ARMSTRONG	SEE BELOW	YES
PCT-7,8	CENTRAL PLANT	CT-1,2 CW	VERTICAL	WATER	760	50	-	YES	13.7	20	1,800	460	3	ARMSTRONG	SEE BELOW	YES

GENERAL NOTES

1. EQUIPMENT TO BE PURCHASED AND FACTORY INSTALLED BY THE PREFABRICATED PLANT MANUFACTURER (EPSILON).

METERING

TAG	LOCATION	SYSTEM SERVED	MEASUREMENT TYPE	OPERATING PRESSURE (PSI)	TEMPERATURE (SUPPLY/RETURN) (°F)	FLOW RATE (GPM or CFH)	LINE SIZE (IN.)	BASIS OF DESIGN
BTU-1	CENTRAL PLANT	CAMPUS HW	BTU	125	130/100	2,300	12	ARMSTRONG VERIS ACCELEBAR
BTU-2	CENTRAL PLANT	CAMPUS CHW	BTU	125	42/58	3,120	12	ARMSTRONG VERIS ACCELEBAR
BTU-3	CENTRAL PLANT	BOILER HW	BTU	125	130/100	350	6	ARMSTRONG VERIS ACCELEBAR
BTU-4	CENTRAL PLANT	AGILITY CW	BTU	125	85/100	1,520	10	ARMSTRONG VERIS ACCELEBAR
BTU-5	CENTRAL PLANT	AGILITY CW CT SIDE	BTU	125	85/100	1,520	10	ARMSTRONG VERIS ACCELEBAR
BTU-6	CENTRAL PLANT	AGILITY WELL FIELD	BTU	125	73/60 - 36/43	4,100	14	ARMSTRONG VERIS ACCELEBAR
BTU-7	CENTRAL PLANT	TOTAL WELL FIELD	BTU	125	73/60 - 36/43	4,100	14	ARMSTRONG VERIS ACCELEBAR
FM-1	CENTRAL PLANT	CT-1,2 MAKE-UP	GPM	125	65-95	100	3	NEPTUNE TRU-FLO 3" COMPOUND METER
FM-2	CENTRAL PLANT	CT-1,2 BLOWDOWN	GPM	125	65-95	4	3	NEPTUNE TRU-FLO 3" COMPOUND METER
VM-1					NOT USED			
VM-2	CENTRAL PLANT	AGILITY EVAP DTS	GPM	125	42/58 - 36/43	1,025	8	ONICON
VM-3	CENTRAL PLANT	AGILITY EVAP DTS	GPM	125	42/58 - 36/43	1,025	8	ONICON
VM-4	CENTRAL PLANT	AGILITY EVAP DTS	GPM	125	42/58 - 36/43	1,025	8	ONICON
VM-5	CENTRAL PLANT	AGILITY EVAP DTS	GPM	125	42/58 - 36/43	1,025	8	ONICON
VM-6	CENTRAL PLANT	AGILITY COND DTS	GPM	125	60/73 - 85/100 - 95/120	800	8	ONICON
VM-7	CENTRAL PLANT	AGILITY COND DTS	GPM	125	60/73 - 85/100 - 95/120	800	8	ONICON
VM-8	CENTRAL PLANT	AGILITY COND DTS	GPM	125	60/73 - 85/100 - 95/120	800	8	ONICON
VM-9	CENTRAL PLANT	AGILITY COND DTS	GPM	125	60/73 - 85/100 - 95/120	800	8	ONICON
VM-10	CENTRAL PLANT	CT-1,2 MAKE-UP	GPM	125	65-95	100	3	ONICON
VM-11	CENTRAL PLANT	HRCH-1 CHW	GPM	125	42/58	550	6	ONICON
VM-12	CENTRAL PLANT	HRCH-1 HW	GPM	125	130/100	325	6	ONICON
VM-13	CENTRAL PLANT	HRCH-2 CHW	GPM	125	42/58	550	6	ONICON
VM-14	CENTRAL PLANT	HRCH-2 HW	GPM	125	130/100	325	6	ONICON
VM-15	CENTRAL PLANT	HRCH-3 CHW	GPM	125	42/58	550	6	ONICON
VM-16	CENTRAL PLANT	HRCH-3 HW	GPM	125	130/100	325	6	ONICON

GENERAL NOTES

1. EQUIPMENT TO BE OWNER PURCHASED, SHIPPED DIRECT TO PREFABRICATED PLANT MANUFACTURER (EPSILON), AND INSTALLED BY EPSILON IN FACTORY

AIR ELIMINATORS

UNIT NUMBER	LOCATION	SYSTEM SERVED	FLOW (GPM)	SIZE (IN.)	Δ PRESS (FT. W.C.)	BASIS OF DESIGN	REMARKS	NOTES SEE BELOW
AS-1	CENTRAL PLANT	PLANT HW	3,200	12	9	SPIROTHERM VSR 1200	AIR	
AS-2	CENTRAL PLANT	CAMPUS HW	2,300	12	9	SPIROTHERM VSR 1200	AIR	

GENERAL NOTES

1. EQUIPMENT TO BE PURCHASED AND FACTORY INSTALLED BY THE PREFABRICATED PLANT MANUFACTURER (EPSILON).

Prepared by Owner's on-staff Design professionals

Watchtower Bible and Tract Society of New York, Inc.
900 Red Mills Road
Wallkill, NY, 12589-3299
Tel: 1 (845) 306-3330
InboxHPR.US@jw.org

BR+A
105 Madison Ave
10th Floor
New York, NY 10016
www.brplusa.com

HPR headquarters project | ramapo

JW.ORG

REV	DATE	DESCRIPTION	ISS
12	10.25.22	INFORMATION	JB
11	09.29.22	INFORMATION	JB
10	08.05.22	SUBMISSION	JB
9	02.28.22	INFORMATION	JF
8	02.10.22	INFORMATION	AJT
7	01.14.22	INFORMATION	AJT
6	11.18.21	INFORMATION	AJT
5	09.07.21	INFORMATION	AJT

Title: EQUIPMENT SCHEDULES

Project: CENTRAL ENERGY PLANT
Address: 155 STERLING MINE ROAD
SLOATSBURG, NY 10974

Project no. 19009 Revision P12

Sheet M-603

Custom Unit which is not certified in accordance with the AHRI Water-Cooled Water-Chilling and Heat Pump Water-Heating Packages Certification Program, but is rated in accordance with AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI).

	Unit	2	3	4	5
Chiller Tag		CT Cooling	Sim HC	Geo Cool 1	Geo Heat 1
Revision Level		9247	9247	9247	9247
Performance Information					
Full Load Cooling Capacity	ton	370	350	370	270
Evaporator TONS	ton	370	350	370	270
Condenser Q	MBh	-5350.5	-5590.3	-5338.2	-4449.8
Order kW/ton	kW/ton	0.7319	1.1828	0.7219	1.3054
Order Part Load Value	kW/ton	0.4512	1.2081	0.4216	
Unit Order kW	kW Input	270.79	413.99	267.11	352.45
Unit Information					
Unit Model		HDWA	HDWA	HDWA	HDWA
Unit Size		400	400	400	400
Refrigerant Type		R134a	R134a	R134a	R134a
Starter Model		VFDC	VFDC	VFDC	VFDC
Starter Type		UAFD	UAFD	UAFD	UAFD
Circuit 1 Starter Size		675	675	675	675
Starter Filter		Y	Y	Y	Y
Circuit 1 Motor CPKW		441	441	441	441
Line Hertz	Hz	60	60	60	60
Line Volt	V	460	460	460	460
Motor Hertz	Hz	60	60	60	60
Motor Volt	V	460	460	460	460
Circuit 1 Stage 1 IGV	°	90	90	90	90
Circuit 1 Impeller Speed	rpm	16425	18392	16373	18484
Circuit 1 CPIM					
Stage 1 impeller size mm		200	200	200	200
Stage 2 impeller size mm		174	174	174	174
Circuit 1 Stage 1 Blade Diameter	inch	7.874	7.874	7.874	7.874
Circuit 1 Stage 2 Blade Diameter	inch	6.85	6.85	6.85	6.85
Circuit 1 Orifice ORSZ		400	400	400	400
Evaporator Information					
Evaporator Fluid Leaving Temperature	°F	40	41	40	30
Evaporator Fluid Entering Temperature	°F	58	58	58	35
Evaporator Fluid Flow	gpm	507.3	508.1	507.3	1325.9
Evaporator gpm/ton	gpm/ton	1.37	1.45	1.37	4.91
Evaporator Fluid Total Pressure Drop	ft of water	3.44	3.47	3.44	25.56
Evaporator Tube Fluid Velocity	ft/s	2.901	2.906	2.901	7.582
Evaporator Fluid Type		PG	PG	PG	PG
Evaporator Fluid Concentration	% Weight	20	20	20	20
Evaporator Fouling Factor	h.°F.ft²/Btu	0.00025	0.00025	0.00025	0.00025

Evaporator Inlet Side		LEFT	LEFT	LEFT	LEFT
Evaporator Shell Size		040A	040A	040A	040A
Evaporator Bundle Size		A	A	A	A
Evaporator Tube Code		TMCU	TMCU	TMCU	TMCU
Evaporator Tube Thickness		25	25	25	25
Evaporator Waterbox Pressure	psi	150	150	150	150
Evaporator Waterbox Type		NMAR	NMAR	NMAR	NMAR
Evaporator Pass		2	2	2	2
Circuit 1 Evaporator Refrigerant Saturated Temperature	°F	32.53	34.22	32.53	27.53
Evaporator Minimum Fluid Flow	gpm	345.3	345.3	345.3	385.8
Evaporator Maximum Fluid Flow	gpm	1848.1	1848.1	1848.1	1848.1
Condenser Information					
Condenser Fluid Entering Temperature	°F	82	113	86	113
Condenser Fluid Leaving Temperature	°F	97	127	94	127
Condenser Fluid Flow	gpm	733.2	822.2	1371.5	654.5
Condenser gpm/ton	gpm/ton	1.98	2.35	3.71	2.42
Condenser Fluid Total Pressure Drop	ft of water	12.52	14.14	37.76	9.51
Condenser Tube Fluid Velocity	ft/s	5.186	5.815	9.701	4.629
Condenser Fluid Type		PG	PG	PG	PG
Condenser Fluid Concentration	% Weight	20	20	20	20
Condenser Fouling Factor	h.°F.ft²/Btu	0.00025	0.00025	0.00025	0.00025
Condenser Inlet Side		LEFT	LEFT	LEFT	LEFT
Condenser Shell Size		040A	040A	040A	040A
Condenser Bundle Size		C	C	C	C
Condenser Tube Code		TECU	TECU	TECU	TECU
Condenser Tube Thickness		28	28	28	28
Condenser Waterbox Pressure	psi	150	150	150	150
Condenser Waterbox Type		NMAR	NMAR	NMAR	NMAR
Condenser Pass		2	2	2	2
Circuit 1 Condenser Refrigerant Saturated Temperature	°F	100.16	130.08	97.61	129.22
Condenser Minimum Fluid Flow	gpm	425.5	425.5	425.5	425.5
Condenser Maximum Fluid Flow	gpm	1550.2	1550.2	1550.2	1550.2
Electrical Information					
Circuit 1 Order RLA	A	354.7	539.8	349.9	469.9
Circuit 1 Motor Order RLA	A	415.4	646.8	409.8	549.6
Circuit 1 Line-Side MCA	A	442	674	436	586
Circuit 1 Line-Side MOP	A	700	1200	700	1000
Physical Information					
Unit Shipping Weight	lb	13899	13899	13899	13899
Unit Operating Weight	lb	16332	16326	16331	16328
Unit Refrigerant Charge	lb	800	800	800	800
Heat Rejected to Equipment Room	MBh	-4.62	-7.07	-4.56	-6.02
Circuit 1 Starter Heat Rejected to Ambient	MBh	-16.8	-30.3	-16.5	-24.4
Condenser Shell Construction		ASME	ASME	ASME	ASME
Unit Operating Weight	lb	69288	69288	69288	69288
Unit Refrigerant Charge	lb	2700	2700	2700	2700

Unit Overview

Chiller Model	RTWD - water cooled chiller
Unit Nominal Tonnage	250
IPLV.IP	0.6265 kW/ton
Unit Voltage	460. volt 3 phase
Refrigerant Type	R-134a
Agency Listing	UL listed to US/Canadian safety std
Pressure Vessel Code	ASME pressure vessel code
Number of Compressors	2
Number of Circuits	2
Model Number	RTWD250F2**2A*C1A*2A2*1Y1 D1A400A301010007CA200D********200*

Evaporator Information

Evaporator Application	
Low temp	

Fluid Properties		Construction Features	
Fluid Type	Propylene glycol	**Number of Passes**	2 pass evap
Fluid Concentration	20.00 %	**Water Connection Size**	6.000 in
Freeze Point	19.16 F	**Water Side Pressure**	150 psi/10 bar evap water pressure
		Fouling Factor	0.0001000 hr-sq ft-deg F/ Btu

Condenser Information

Unit Application
Water -water heat pump

Fluid Properties		Construction Features	
Fluid Type	Propylene glycol	**Number of Passes**	2 pass
Fluid Concentration	20.00 %	**Water Connection Size**	6.000 in
		Water Side Pressure	150 psi/10.5 bar cond pressure
		Fouling Factor	0.000250 hr-sq ft-deg F/ Btu

Unit Electrical

Unit			RLA	LRA
Unit Voltage	460. volt 3 phase	**Compressor A**	145.00 A	285.00 A
Frequency	60. hertz	**Compressor B**	145.00 A	285.00 A
Compressor Starter	Wye-delta		**MCA**	**MOP**
Incoming Power Line Conn. Type	Single point	**Single Point Power**	329.00 A	450.00 A
Power Line Conn. Type	Circuit breaker			
Short Circuit Current Rating	10000.00 A			

Dual Operating WWHP

Performance	Heating Mode	Cooling Mode
Refrigeration Capacity	125.8 tons	145.6 tons
Cooling Efficiency	1.618 kW/ton	1.448 kW/ton
Cooling Efficiency	7.417 EER (Btu/W-h)	8.290 EER (Btu/W-h)
Heating Capacity	2204.16 MBh	2466.53 MBh
Heating Efficiency	3.172 COP (kW/kW)	3.428 COP (kW/kW)
NPLV.IP	0.6265 kW/ton	
NPLV.IP EER	19.15 EER (Btu/W-h)	
Total Power	203.5 kW	210.8 kW

Evaporator		
Leaving Fluid Evap.	30.0 F	40.0 F
Entering Fluid Evap.	38.0 F	55.03 F
Flow Rate Evap.	390.3 gpm	240.0 gpm
Min Flow Rate	334.0 gpm	240.0 gpm
Pressure Drop Evap.	8.23 ft H2O	3.03 ft H2O
Pressure Drop at Min Flow	5.89 ft H2O	3.03 ft H2O

Condenser		
Leaving Fluid Cond.	127.00 F	127.00 F
Entering Fluid Cond.	113.22 F	111.68 F
Flow Rate Cond.	326.0 gpm	326.0 gpm
Min Flow Rate	326.0 gpm	326.0 gpm
Pressure Drop Cond.	3.85 ft H2O	3.85 ft H2O
Pressure Drop at Min Flow	3.85 ft H2O	3.85 ft H2O

Physical Information

Dimensions		Weights		Charge	Circuit 1	Circuit 2
Length	147.870 in	Operating Weight	10070.7 lb	Refrigerant	180.8 lb	180.8 lb
Width	47.758 in	Shipping Weight	9477.7 lb	Oil	3.10 gal	3.10 gal
Height	76.972 in	All weights +/- 3%				

Unit Acoustics

Octave Bands	63	125	250	500	1K	2K	4K	8K
Sound Pressure	64 dB	64 dB	72 dB	68 dB	78 dB	75 dB	61 dB	56 dB

Unit Sound Package	Factory installed	A-weighted Sound Pressure	81 dBA

Note: In Accordance with AHRI 575

Test Information

Performance Test Type	Customer inspection

Performance	Test Point 1	Test Point 2	Test Point 3	Test Point 4
Refrigeration Capacity				
Cooling Efficiency				
Total Power				
Leaving Water Evap.				
Entering Water Evap.				
Flow Evap.				
Pressure Drop Evap.				
Leaving Water Cond.				
Entering Water Cond.				
Flow Cond.				
Pressure Drop Cond.				

Warranty

Standard Warranty

Information for LEED Projects

Rated Cooling Efficiency (AHRI)	0.7835 kW/ton
Rated Refrigeration Capacity (AHRI)	228.1 tons
IPLV.IP	0.6265 kW/ton
Refrigerant (R-134a) - ckt 1	180.8 lb
Refrigerant (R-134a) - ckt 2	180.8 lb

Outside the scope of AHRI Water-Cooled Water-Chilling and Heat Pump Water-Heating Packages Certification Program or not optionally certified, but is rated in accordance with AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI).

Trane Select Assist Version Number:	265
Data Generation Date:	11/18/2022

ELECTRIC

RESISTANCE BOILERS

Steam or Hot Water

Boiler Book
10/2019

Table 4. Model WB Ratings 480V, 600V Supplies

Model	Vessel Capacity (gallons)	Rated kW	MBTU/HR	ELEMENTS		# of CONTACTORS	NUMBER and kW of STEPS	3-PHASE AMPERES	
				Qty	kW	480/600V	480/600V	480V	600V
WB-120	16	12	41	3	4	1	1 @ 12	15	13
		18	61	3	6	1	1 @ 18	22	18
		24	82	6	4	1	1 @ 24	30	24
		30	102	6	5	1	1 @ 30	37	29
		36	123	6	6	1	1 @ 36	44	35
		45	154	9	5	2	1 @ 45	55	44
		54	184	9	6	2	1 @ 54	66	53
		60	205	12	5	2	2 @ 30	73	58
		72	246	12	6	2	2 @ 36	87	70
WB-121	16	90	307	15	6	3	2 @ 36, 1 @18	109	87
		108	368	18	6	3	3 @ 36	131	105
		126	430	21	6	4	3 @36, 1 @18	152	122
		144	491	24	6	4	4 @ 36	174	139
WB-122	25	162	553	27	6	5	3 @36, 1 @54	196	157
		180	614	30	6	5	5 @ 36	217	174
		198	676	33	6	6	5 @36, 1@18	239	191
		216	737	36	6	6	6 @ 36	261	209
		234	798	39	6	7	6 @36, 1 @18	282	226
		252	860	42	6	7	7 @ 36	304	243
		270	921	45	6	8	7 @36, 1 @18	326	261
		288	983	48	6	8	8 @ 36	347	278
WB-201	78	324	1105	54	6	9	3 @72, 3 @36	391	313
		360	1228	60	6	10	2 @72, 6 @36	434	347
		396	1350	66	6	11	3 @72, 5 @36	477	382
		432	1474	72	6	12	4 @72, 4 @36	521	417
WB-202	78	468	1597	78	6	13	5 @72, 3 @36	564	451
		504	1720	84	6	14	6 @72, 2 @36	607	486
		540	1842	90	6	15	7 @72, 1 @36	651	521
		576	1965	96	6	16	8 @72	694	555
WB-241	122	600	2047	60	10	20	10 @ 60	723	579
		630	2150	63	10	21	3 @30, 9 @60	759	607
		660	2252	66	10	22	2 @30, 10 @60	795	636
		690	2354	69	10	23	1@30, 11 @60	831	665
		720	2457	72	10	24	12 @60	868	694
WB-242	122	750	2559	75	10	25	5 @90, 5 @60	904	723
		780	2661	78	10	26	6 @90, 4 @60	940	752
		810	2764	81	10	27	7 @90, 3 @60	976	781
		840	2866	84	10	28	8 @90, 2 @60	1012	810
		870	2968	87	10	29	9 @90, 1 @60	1048	838
		900	3071	90	10	30	10 @ 90	1084	868
		930	3173	93	10	31	7 @90, 5 @60	1120	896
		960	3276	96	10	32	8 @90, 4 @60	1157	925
WB-243	142	990	3378	99	10	33	9 @90, 3 @60	1193	954
		1020	3480	102	10	34	10 @90, 2 @60	1229	983
		1050	3583	105	10	35	11 @90, 1 @60	1265	1012
		1080	3685	108	10	36	12 @ 90	1301	1041
		1110	3787	111	10	37	9 @90, 5 @60	1337	1070
		1140	3890	114	10	38	10 @90, 4 @60	1373	1099
		1170	3992	117	10	39	11 @90, 3 @60	1409	1128
		1200	4094	120	10	40	12 @90, 2 @60	1446	1157
WB-361	235	1224	4176	102	12	34	10 @108, 2 @72	1474	1180
		1260	4299	105	12	35	11 @108, 1 @72	1518	1214
		1296	4422	108	12	36	12 @ 108	1561	1249

Table 13. Model WB Max Flow Ratings Sheet 1 of 2

Model #	Rated kW	System Temperature Drop ^{0}F							
		10	20	30	40	50	60	70	80
		Maximum Flow Rate in GPM							
WB-120	12	8.2	4.5	3	2	1.75	1.5	1.25	1
	18	12.4	6.5	4.5	3.2	2.6	2	1.75	1.6
	24	16.5	8	5.5	4.1	3.2	2.75	2.3	2.1
	30	20.5	10.3	6.75	5.1	4.1	3.4	3	2.6
	36	24.5	12.25	8.2	6.2	4.9	4.1	3.5	3.1
	45	30.9	15.7	10.3	7.7	6.3	5.1	4.4	3.9
	54	37	18.4	12.3	9.2	7.4	6.1	5.3	4.6
	60	41	20.5	13.5	10.3	8.2	6.8	5.8	5.1
	72	49.5	24.2	16.5	12.3	9.8	8.2	7	6.1
WB-121	90	61.5	30.5	20.5	15.4	12.3	10.3	8.8	7.7
	108	73.6	37	24.7	18.5	14.8	12.3	10.6	9.2
	126	86	43	28.7	21.6	17.3	14.4	12.3	10.8
	144	98	49.2	32.9	24.6	19.7	16.5	14.1	12.3
WB-122	162	110.5	55.5	37	27.7	22.2	18.5	15.9	13.7
	180	122.6	61.5	41	30.8	24.6	20.5	17.6	15.4
	198	135.5	67.5	45	33.9	27.1	22.6	19.4	16.9
	216	148	74	49.3	37	29.6	24.6	21.1	18.5
	234	160	80	53.4	40	32	26.7	22.9	20
	252	172	86	57.5	43.1	34.5	28.8	24.6	21.6
	270	184.3	92.4	61.6	46.2	37	30.8	26.4	23.2
	288	196	98.5	65.7	49.3	39.5	32.9	28.2	24.6
WB-201	324	222	111	74	55.5	44.4	37	31.7	27.7
	360	246.5	123	82.2	61.6	49.3	41.1	35.2	30.8
	396	271	135.5	90.4	67.8	54.2	45.2	38.7	33.9
	432	296	148	98.6	74	59.2	49.3	42.3	37
WB-202	468	320	160.3	106.8	80.1	64.1	53.4	45.8	40
	504	345	172.5	115	86.3	69	57.5	49.3	43.2
	540	370	185	123.3	92.5	74	61.6	52.8	46.2
	576	394	197	131.5	98.6	79	65.7	56.4	49.3
WB-241	600	411	205.5	137	102.7	82.2	68.5	58.7	51.4
	630	431	215.5	143.8	107.9	86.3	71.9	61.6	53.9
	660	452	226	150.7	113	90.4	75.3	64.6	56.5
	690	472	236	157.5	118.2	94.5	78.8	67.5	59.1
	720	493	246.4	164.4	123.3	98.6	82.2	70.5	61.6
WB-242	750	514	257	171.2	128.4	102.7	85.6	73.4	64.2
	780	534	267	178.1	133.6	106.8	89	76.3	66.8
	810	555	277.5	185	138.7	110.9	92.5	79.2	69.3
	840	575	287.5	191.8	143.8	115.1	95.9	82.2	71.9
	870	596	298	198.6	150	119.2	99.3	85.1	74.5
	900	615	308	205.5	154.1	123.3	102.7	88.1	77
	930	637	318.5	212.3	159.2	127.4	106.2	91	79.6
	960	657	328.5	219.2	164.4	131.5	109.6	93.9	82.2

Baltimore Aircoil Company

Cooling Tower Selection Report

Version: 8.11.0 NA
Product data correct as of: October 15, 2020

Project Name: BRA-1
Selection Name: 1
Project State/Province: New York
Project Country: United States
Date: November 03, 2020

Model Information

Product Line: Series 3000
Model: XES3E-1222-07M ENDURA
Number of Units: 1

This model includes the ENDURADRIVE® Fan System.
Fan Type: Standard Fan
Fan Motor: (1) 20.00 = 20.00 HP/Unit
Total Standard Fan Power: Full Speed, 20.00 BHP/Unit
IBC 2018 Code Compliance: No
California OSHPD Project: No
Special Seismic Certification: No
Intake Option: None
Internal Option: None
Discharge Option: None

Design Conditions

Flow Rate:	756.00	USGPM
Hot Water Temp.:	97.00	°F
Cold Water Temp.:	82.00	°F
Wet Bulb Temp.:	75.80	°F
Tower Pumping Head:	4.91	psi
Reserve Capability:	40.85	%
Heat Rejection:	5,667,732	BTUH

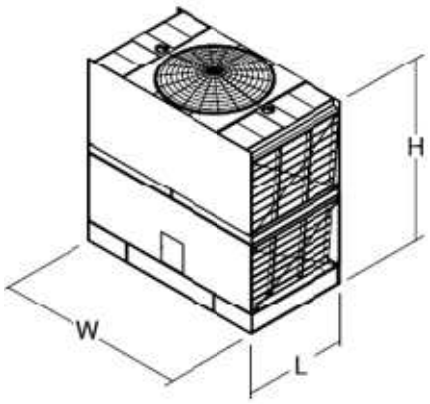
Thermal performance at design conditions and standard total fan motor power is certified by the Cooling Technology Institute (CTI).

Engineering Data, per Unit

Unit Length:	11' 09.75"	
Unit Width:	21' 06.50"	
Unit Height:	12' 09.00"	
Air Flow:	122,978	CFM
Approximate Shipping Weight:	13,480	pounds
Heaviest Section:	13,480	pounds
Approximate Operating Weight:	26,510	pounds

Heater kW Data (Optional)

0°F (-17.8°C) Ambient Heaters:	(2) 10	kW
-20°F (-28.9°C) Ambient Heaters:	(2) 14	kW



Minimum Distance Required for Single Unit:
(For multiple units, refer to Layout Guidelines)

From Solid Wall:	5.5	ft.
From 50% Open Wall:	3	ft.

Energy Rating:
89.35 per ASHRAE 90.1, ASHRAE 189 and CA Title 24.
This XE model is an extremely efficient model, with a base energy rating that meets or exceeds 2x the minimum ASHRAE 90.1 energy rating.

Note: These unit weights and dimensions account for the selected fan type for the standard cataloged drive configuration, but they do not account for other options/accessories. Please contact your local BAC sales representative for weights and dimensions of units with other options/accessories.

Bell & Gossett GPX™

Gasketed Plate Heat Exchanger Specification Sheet

175 Standard Parkway
Cheektowaga, New York 14227
1-800-447-7700
www.xylem.com/bellgossett

Customer		Date	Wednesday, November 16, 2022
Inquiry Number	830366	Item Number	

Performance of One Unit: AP188 PN: BY5427 **Units Connected in Parallel:** 1

Fluid Name	Water		Water
Total Flow	1,605.74 GPM		1,605.27 GPM
Inlet Temperature	58.00 °F		40.00 °F
Outlet Temperature	42.00 °F		56.00 °F
Operating Pressure	0.00 PSIG		0.00 PSIG
Pressure Drop, Allow./Calc	2.05/2.05 PSIG		2.05/2.05 PSIG
Density	62.42 lb/ft3		62.44 lb/ft3
Viscosity	1.31 cp		1.35 cp
Specific Heat	1.00 Btu/lbm,°F		1.00 Btu/lbm,°F
Thermal Conductivity	0.33 Btu/ft,h,°F		0.33 Btu/ft,h,°F
Specified Fouling Factor	0.00010 hr,ft2,°F/Btu		0.00010 hr,ft2,°F/Btu

Total Heat Exchanged	12,900,000.00 Btu/h
LMTD	2.00 °F
Overall Heat Transfer Coefficient, Clean/Dirty	642.65/569.46 Btu/hr,ft2,°F
Overall Heat Transfer Coefficient, Service	442.14 Btu/hr,ft2,°F
Effective Surface Area	14,578.21 ft2
Excess Surface	28.77 %

Construction

Number of Passes * Channels	1*346		1*346
Total Number of Plates		693	
Pressure, Design/Test	150/195(PSIG)		150/195(PSIG)
Design Temperature, min/max	32/284(°F)		32/284(°F)
Internal Volume	89.20(ft3)		89.20(ft3)
Inlet Connection(Location)	F1, steel studded port for 150# ansi flange 12.00 "		F3, steel studded port for 150# ansi flange 12.00 "
Outlet Connection(Location)	F4, steel studded port for 150# ansi flange 12.00 "		F2, steel studded port for 150# ansi flange 12.00 "

Plate Material	304
Plate Thickness	0.50 mm
Plate Mix	TLX
Gasket Material	NITRILE HT
Empty/Flooded Weight	21,045 / 32,182 lb
Frame Size / Max. Frame Capacity	196.85 inch / 859 plates
Approvals	ASME Sect VIII Div 1 w/U stamp.
Notes	This heat exchanger is certified by the AHRI Liquid to Liquid heat exchangers certification program based on AHRI Standard 400. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third party verified. Certified units may be found in the AHRI directory at www.ahridirectory.org.

Note: Customer to verify fluid/material compatibility.

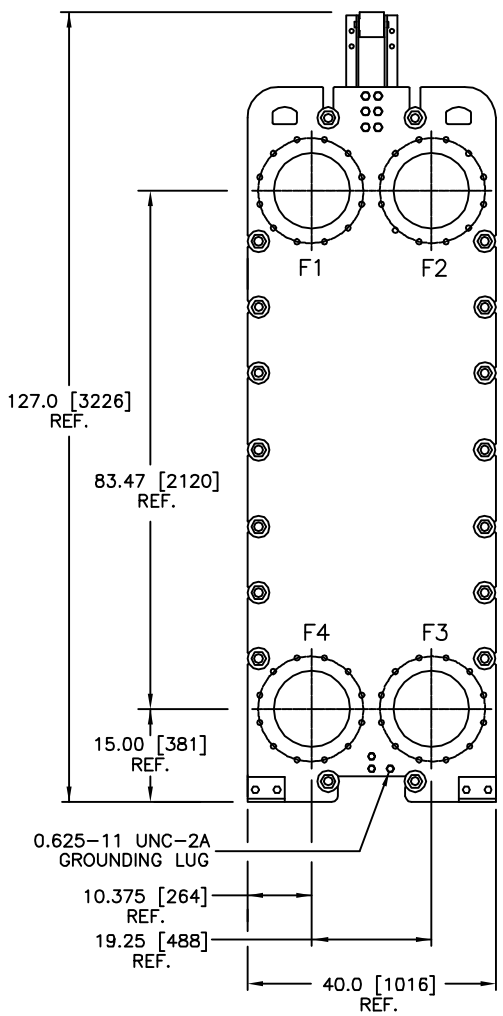
Performance evaluation is dependent on customers' ability to provide sufficiently accurate measurements.

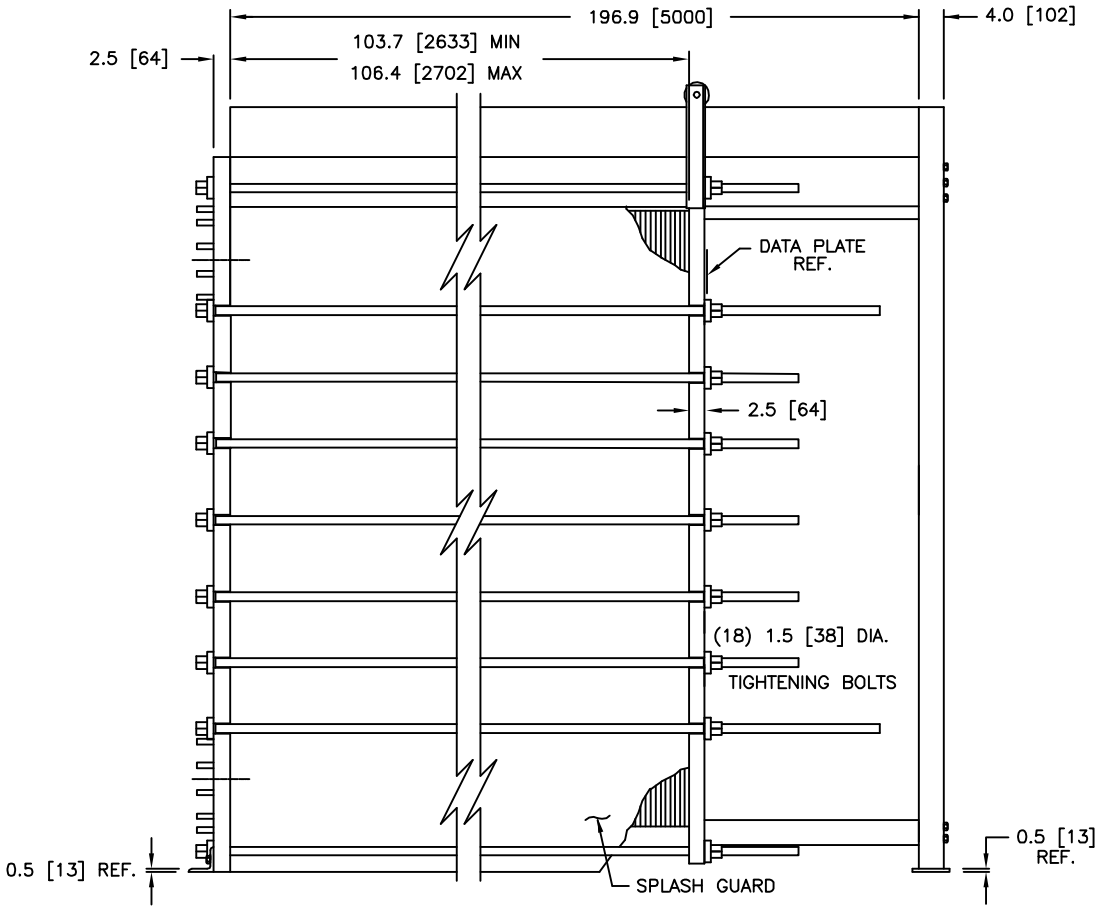
Andrew Walsh

Version No.: GPHE: V5/31/2022

REV NO.	REVISION NOTE	REV BY	REV DATE

NOTE(s): 1. Dimensions shown in inches (in.)





EST. WEIGHT (LBS): 21045 DRY / 32182 WET

UNIT CONSTRUCTION – ASME CODE	
THERMAL PLATES:	0.5mm / AISI304
GASKET TYPE:	NITRILE HT
PLATE MIXTURE:	TLX
MIX (SIDE 1):	1 x 346
MIX (SIDE 2):	1 x 346
PLATE QUANTITY:	693 / 859 MAX
CARRY BAR LGTH:	5000mm
CARRY BAR MTL:	STL
TIE BOLTS:	STEEL (ZINC PLATED)
SPLASH GUARD:	ALUMINUM

DESIGN CONDITIONS:	SIDE–1	SIDE–2
DSGN PRESS. (PSIG)	150	150
TEST PRESS. (PSIG)	195	195
DSGN TEMP. (°F)	284	284
MIN. TEMP. (°F)	32	32

PORT IDENTIFICATION		CONNECTION – TYPE AND DESCRIPTION
F1	SIDE–1 IN	12" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED
F4	SIDE–1 OUT	12" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED
F3	SIDE–2 IN	12" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED
F2	SIDE–2 OUT	12" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED

MADE:	ITT	11/16/22
CHK:	HT	11/16/22

ORDER NO. NA

REV.

Bell & Gossett
Buffalo, NY 14227 USA

MODEL AP188

830366–00

HX-5,6

Bell & Gossett GPX™

Gasketed Plate Heat Exchanger Specification Sheet

175 Standard Parkway
Cheektowaga, New York 14227
1-800-447-7700
www.xylem.com/bellgossett

Customer		Date	Wednesday, November 16, 2022
Inquiry Number	830366	Item Number	

Performance of One Unit: AP81 PN: BY5421 **Units Connected in Parallel:** 1

Fluid Name	Water		Water		
Total Flow	2,273.45	GPM	1,208.97	GPM	
Inlet Temperature	130.00	°F	95.00	°F	
Outlet Temperature	114.00	°F	125.00	°F	
Operating Pressure	0.00	PSIG	0.00	PSIG	
Pressure Drop, Allow./Calc	2.10/2.10	PSIG	2.10/0.66	PSIG	
Density	61.63	lb/ft3	61.80	lb/ft3	
Viscosity	0.57	cp	0.65	cp	
Specific Heat	1.00	Btu/lbm,°F	1.00	Btu/lbm,°F	
Thermal Conductivity	0.37	Btu/ft,h,°F	0.36	Btu/ft,h,°F	
Specified Fouling Factor	0.00010	hr,ft2,°F/Btu	0.00010	hr,ft2,°F/Btu	

Total Heat Exchanged	18,000,000.00	Btu/h
LMTD	10.49	°F
Overall Heat Transfer Coefficient, Clean/Dirty	530.56/479.66	Btu/hr,ft2,°F
Overall Heat Transfer Coefficient, Service	476.65	Btu/hr,ft2,°F
Effective Surface Area	3,598.59	ft2
Excess Surface	0.61	%

Construction

Number of Passes * Channels	1*200	400	1*199
Pressure, Design/Test	150/195(PSIG)		150/195(PSIG)
Design Temperature, min/max	32/284(°F)		32/284(°F)
Internal Volume	21.90(ft3)		21.79(ft3)
Inlet Connection(Location)	F1, steel studded port for 150# ansi flange 12.00 "		F3, steel studded port for 150# ansi flange 12.00 "
Outlet Connection(Location)	F4, steel studded port for 150# ansi flange 12.00 "		F2, steel studded port for 150# ansi flange 12.00 "

Plate Material	304
Plate Thickness	0.50 mm
Plate Mix	TMTL-83
Gasket Material	NITRILE HT
Empty/Flooded Weight	9,706 / 12,433 lb
Frame Size / Max. Frame Capacity	118.11 inch / 485 plates
Approvals	ASME Sect VIII Div 1 w/U stamp.
Notes	This heat exchanger is certified by the AHRI Liquid to Liquid heat exchangers certification program based on AHRI Standard 400. AHRI certified units are subject to rigorous and continuous testing, have performance ratings independently measured and are third party verified. Certified units may be found in the AHRI directory at www.ahridirectory.org.

Note: Customer to verify fluid/material compatibility.

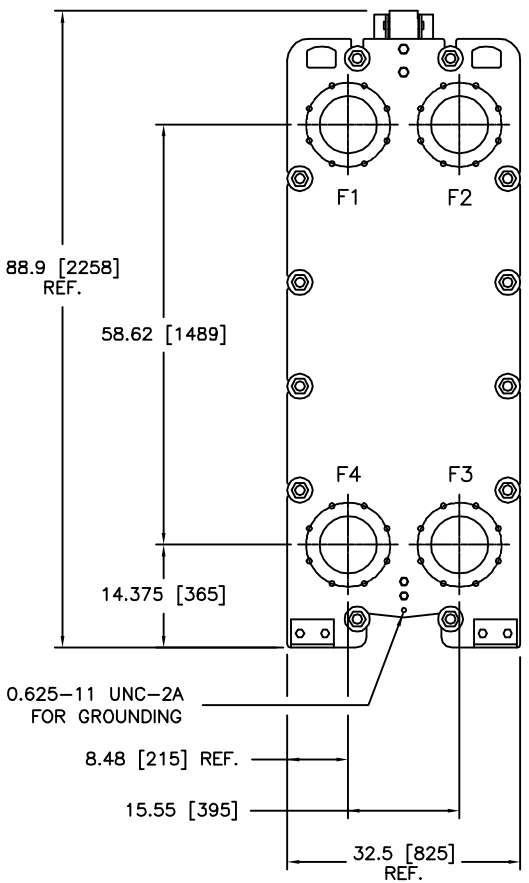
Performance evaluation is dependent on customers' ability to provide sufficiently accurate measurements.

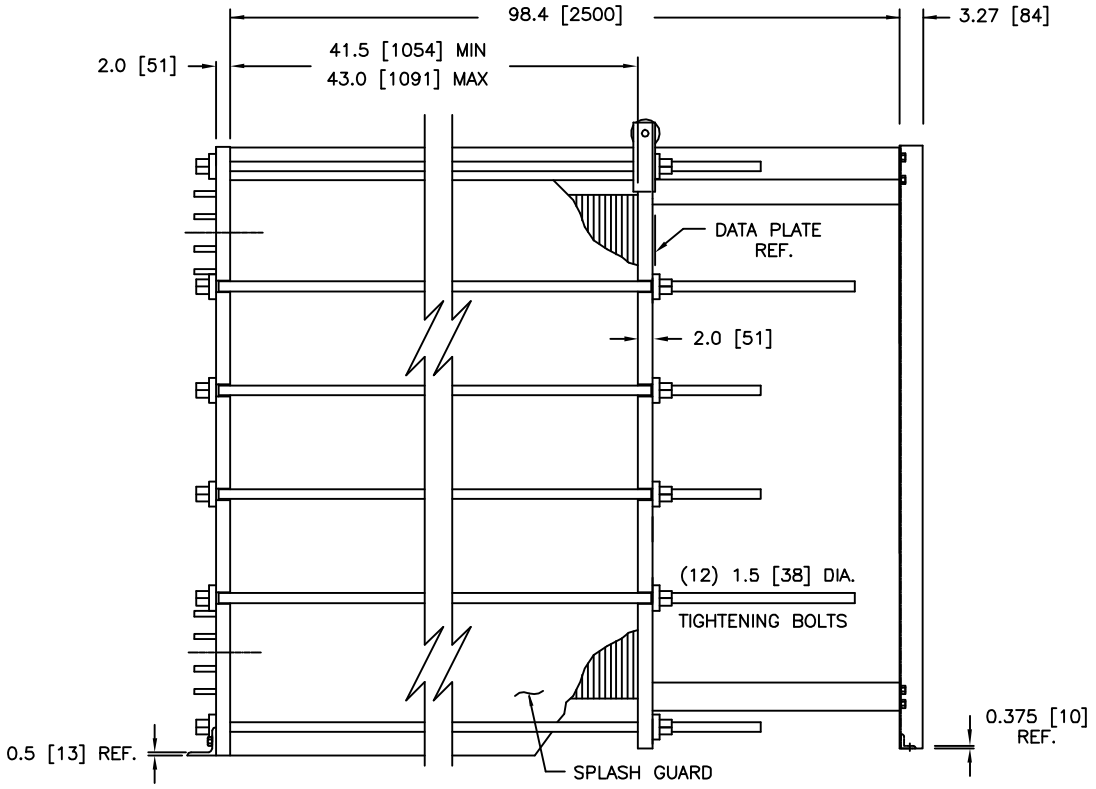
Andrew Walsh

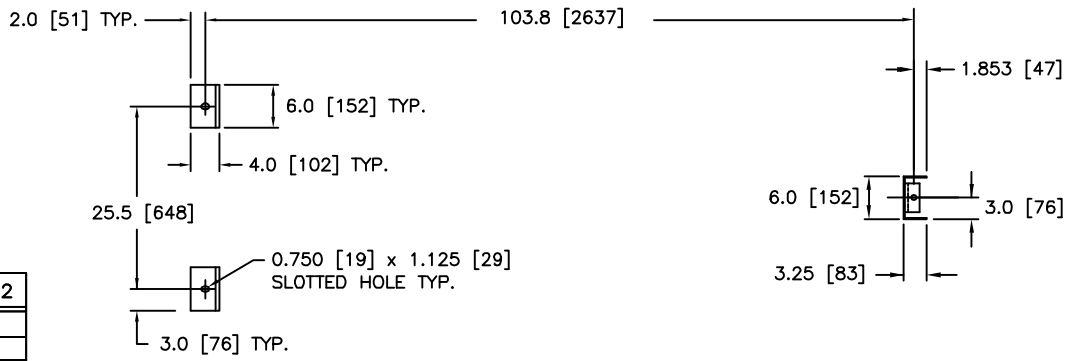
Version No.: GPHE: V5/31/2022

REV NO.	REVISION NOTE	REV BY	REV DATE

NOTE(s): 1. Dimensions shown in inches (in.)







EST. WEIGHT (LBS): 6941 DRY / 8878 WET

UNIT CONSTRUCTION – ASME CODE		DESIGN CONDITIONS:	SIDE–1	SIDE–2
THERMAL PLATES:	0.4mm / AISI304	DSGN PRESS. (PSIG)	150	150
GASKET TYPE:	NITRILE HT	TEST PRESS. (PSIG)	195	195
PLATE MIXTURE:	TKTM–24	DSGN TEMP. (°F)	284	284
MIX (SIDE 1):	1 x 185	MIN. TEMP. (°F)	32	32
MIX (SIDE 2):	1 x 184			
PLATE QUANTITY:	370 / 472 MAX			
CARRY BAR LGTH:	2500mm			
CARRY BAR MTL:	ALUM, S/S PROFILE			
TIE BOLTS:	STEEL (ZINC PLATED)			
SPLASH GUARD:	ALUMINUM			

PORT IDENTIFICATION		CONNECTION – TYPE AND DESCRIPTION
F1	SIDE–1 IN	8" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED
F4	SIDE–1 OUT	8" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED
F3	SIDE–2 IN	8" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED
F2	SIDE–2 OUT	8" PORT, STUDDED FOR 150# ANSI FLANGE, STEEL UNLINED

ORDER NO.	MADE: ITT 11/15/22	CHK: HT 11/15/22	REV.
NA			

Bell & Gossett
Buffalo, NY 14227 USA

MODEL AP100

830231–00

ARMSTRONG

Submittal

Design Envelope Split-Coupled Vertical In-Line Pump

Model: Series Design Envelope Sensorless 4300 0813-030.0

Project name:	undefined	**Representative:**	
Location:		**Phone number:**	
Date submitted:		**e-mail:**	
Engineer:		**Submitted by:**	

Application design data

Tag number:		Configuration:	Single
Service:		Suction pressure:	10 ft
Location:		Fluid:	Propylene Glycol: 20
Qty:	1	Operating temperature:	88 °F
Total system flow:	1751 USgpm	Duty flow per pump:	1751 USgpm
System head:	50 ft	Viscosity:	31 SSU
Environment:	Indoors	Specific gravity:	0.9796
Total dissolved solids:	0 ppm	Safety factor % flow:	0 %
Efficiency at Design:	81.07 %	Safety factor % head:	0 %
NPSHR:	12.61 ft	Absorbed Power/BHP:	26.72 hp
Min. maintained system pressure*:	20 ft	Impeller diameter:	13.19 in
PEIvl:	Not applicable	ERvl:	Not applicable
Standby qty:	0	Pump/motor run qty:	1
Outlet velocity:	11.23 ft/s		

*If minimum maintained system pressure is not known, default is 40% of design head.

Materials of construction

Construction:	Bronze Fitted	Impeller:	Bronze
Rating:	ANSI-125	Pump shaft:	416 Stainless Steel
Connections:	Inlet: 8in, Outlet: 8in	Flush line:	Braided Stainless Steel
Casing (volute):	Cast Iron	Casing gasket:	Confined Non-Asbestos Fiber

Mechanical seal data

Seal type:	Outside Balanced	Rotating face:	Resin Bonded Carbon
Manufacturer code:	C-SSC AB2	Stationary seat:	Sintered Silicon Carbide
Springs:	Stainless Steel	Secondary seal:	Viton
Rotating hardware:	Stainless Steel	Maximum total dissolved solids (TDS)****:	2000 PPM

Electrical data

Supplier:	Factory Choice	Insulation class:	Class F Insulation
Size:	30 hp	Motor type:	Inverter Duty
Frame size:	326TC	Efficiency:	NEMA Premium 12.12
Enclosure:	ODP	Power supply:	460/3/60
Operating speed @ 100% flow:	1168 rpm	Operating speed @ 50% flow***:	772 rpm

***Based on minimum pressure setting of 40% of design head.

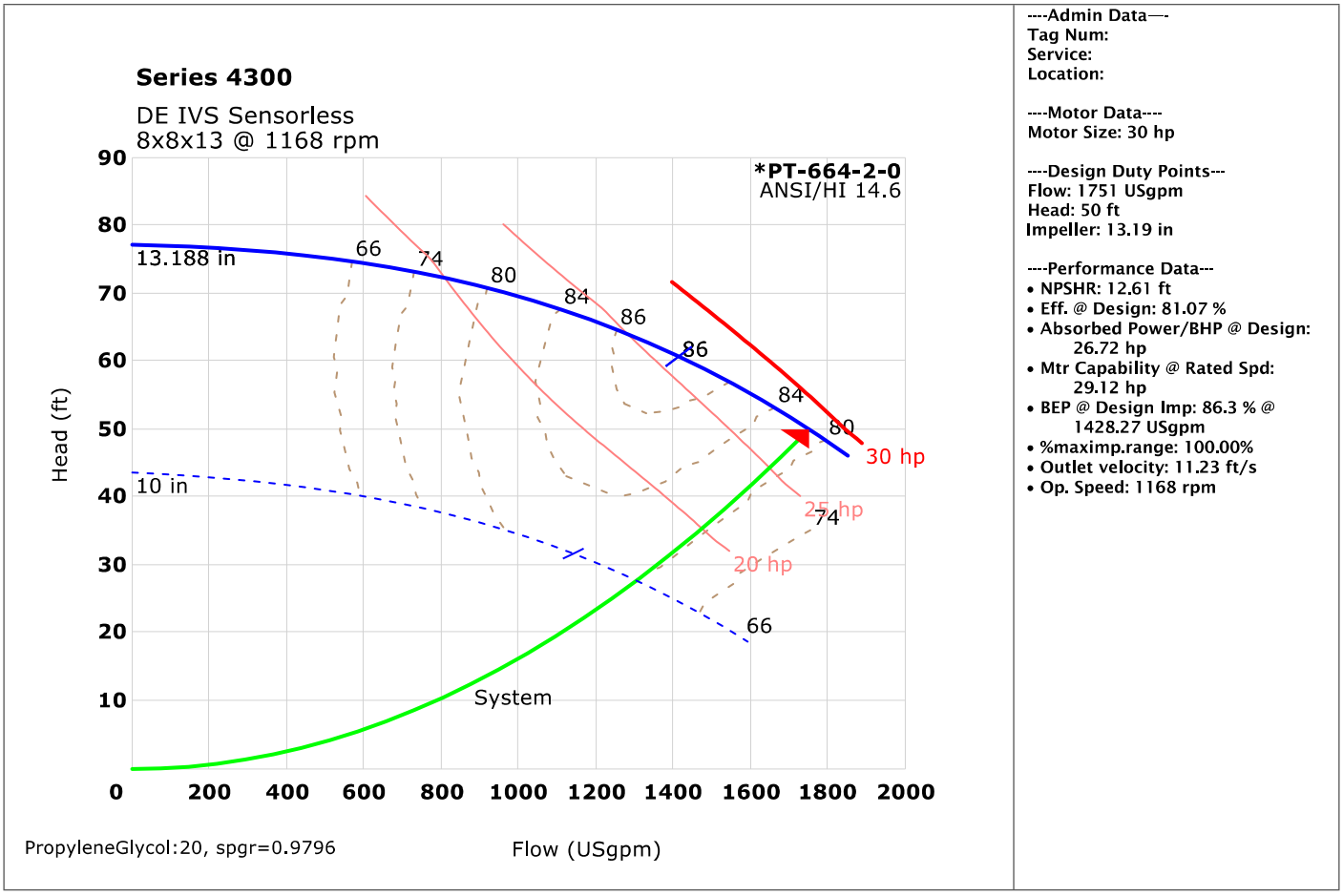
****Note: Please ensure proper seal is selected by inputting Total Dissolved Solids (TDS) in PPM in ADEPT if water quality is poor at site. Also select Flush Line Filter or Cyclone Separator if there are other contaminants in the fluid

IVS controller data

Sensorless control:	Yes - Quadratic press control	Communication port:	RS 485
Communication protocol (*):	Default Field Reconfigurable	Analog inputs:	2 (current or voltage)
Enclosure:	UL Type 12/IP55	Analog outputs:	1 (current)
Fused disconnect switch:	None	Digital inputs:	4 (programmable)
Control orientation:	L1	Digital outputs:	2 (programmable)
Expansion card:	None	Cooling:	Fan cooled through back channel
Absorbed Power/BHP at 50% load/flow and 55% of design head:	14.69 hp	Ambient temperature:	14˚F to 113˚F (up to 3280 ft elevation)
Meets ASHRAE 90.1:	Yes	EMI/RFI control:	Integrated filter to meet EN61800-3
		Harmonic suppression:	Integrated DC link reactor**

(*): If Default - Field reconfigurable is selected, Default from factory will be BACnet MS/TP and can be reconfigured in the field.
** The IVS control is a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. This does not guarantee performance to any system wide harmonic specification or the costs to meet a system wide specification. If supplied with the system electrical details, Armstrong will run a computer simulation of the system wide harmonics. If system harmonic levels are exceeded, Armstrong can also recommend additional harmonic mitigation and the cost for such mitigation.

Performance curve



----Admin Data----
Tag Num:
Service:
Location:

----Motor Data----
Motor Size: 30 hp

----Design Duty Points----
Flow: 1751 USgpm
Head: 50 ft
Impeller: 13.19 in

----Performance Data----
- NPSHR: 12.61 ft
- Eff. @ Design: 81.07 %
- Absorbed Power/BHP @ Design: 26.72 hp
- Mtr Capability @ Rated Spd: 29.12 hp
- BEP @ Design Imp: 86.3 % @ 1428.27 USgpm
- %maximp.range: 100.00%
- Outlet velocity: 11.23 ft/s
- Op. Speed: 1168 rpm

Submittal

close-coupled vertical in-line pump

Model: Series 4380 - 6x6x8 - 4p - 15 hp - PD (Factory Choice Motor)

Project name:	undefined	**Representative:**	
Location:		**Phone number:**	
Date submitted:		**e-mail:**	
Engineer:		**Submitted by:**	

Application design data

Tag number:		Configuration:	Single
Service:		Suction pressure:	0 ft
Location:		Fluid:	Propylene Glycol: 20
Qty:	1	Operating temperature:	130 °F
Total system flow:	780 USgpm	Duty flow per pump:	780 USgpm
System head:	40 ft	Viscosity:	31 SSU
Total dissolved solids:	0 ppm	Specific gravity:	0.9942
NPSHR:	7.6 ft	Absorbed Power/BHP:	9.65 hp
%Mtr Safety*:	40.52%	Efficiency at Design:	81.18 %
Outlet velocity:	8.66 ft/s	Impeller diameter:	7.95 in
PElvl:	0.47	ERvl:	53
Standby qty:	0	Pump/motor run qty:	1

*Motor safety factor above duty point.

Materials of construction

Construction:	Bronze Fitted	Impeller:	Bronze
Rating:	ANSI-125	Casing gasket:	Confined Non-Asbestos Fiber
Connections:	Inlet: 6 in, Outlet: 6 in	Flush line:	Braided Stainless Steel
Casing (volute):	Cast Iron, E-coated	Shaft sleeve:	316 Stainless Steel

Mechanical seal data

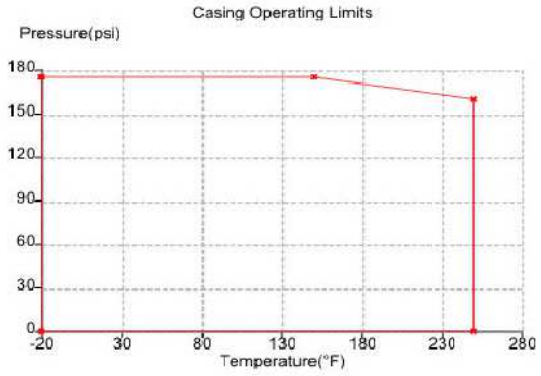
Seal type:	Inside Single Spring	Rotating face:	Resin Bonded Carbon
Manufacturer code:	C-ssc L EPSS 2A	Stationary seat:	Sintered Silicon Carbide
Springs:	Stainless Steel	Secondary seal:	EPDM
Rotating hardware:	Stainless Steel	Maximum total dissolved solids (TDS)*:	2000 PPM

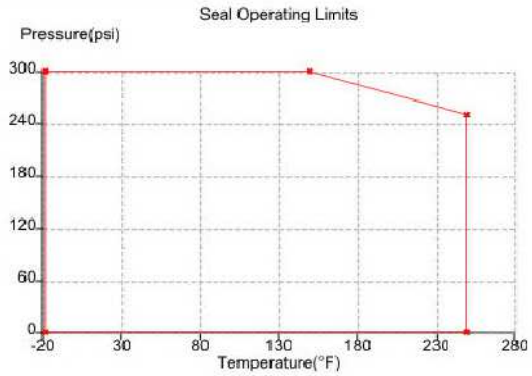
*Note: Please ensure proper seal is selected by inputting Total Dissolved Solids (TDS) in PPM in ADEPT if water quality is poor at site. Also select Flush Line Filter or Cyclone Separator if there are other contaminants in the fluid.

Electrical data

Supplier:	Factory Choice	Insulation class:	Class F Insulation
Frame size:	254JM	Motor type:	Inverter Duty
Speed:	1600 rpm	Size:	15 hp
Enclosure:	ODP	Efficiency:	NEMA Premium 12.12
Power supply:	460/3/60		

Operating limits (temperature - pressure)



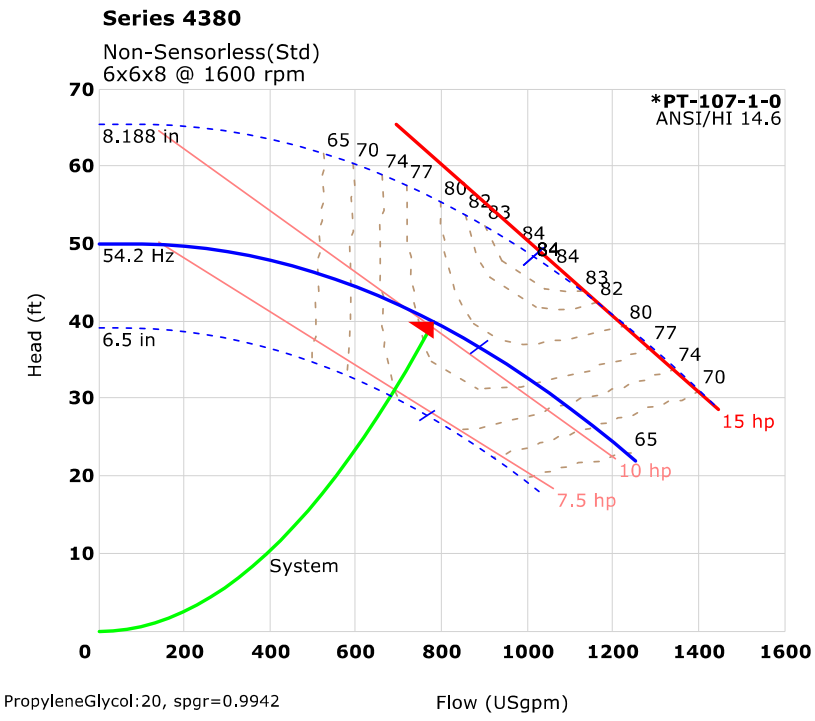


Maximum pressure: 175 psi

Maximum temperature: 250F

All Pump casings are hydrostatically tested to requirements of ANSI/HI 14.6 standard.

Performance curve



----Admin Data—
Tag Num:
Service:
Location:

----Motor Data----
Motor Size: 15 hp

----Design Duty Points---
Flow: 780 USgpm
Head: 40 ft
Impeller: 7.95 in

----Performance Data---
- **NPSHR: 7.6 ft**
- **Eff. @ Design: 81.18 %**
- **Absorbed Power/BHP @ Design: 9.65 hp**
- **Mtr Capability @ Rated Spd: 13.56 hp**
- **Motor safety factor: 40.52%**
- **BEP @ Design Imp: 82.4 % @ 861.56 USgpm**
- **%maximp.range: 85.94%**
- **Outlet velocity: 8.66 ft/s**

CENTRAL ENERGY PLANT

TO DOMESTIC HW SERVING CUP LOCKERS & LAVATORIES (10 GPM; 120F) SEE PLUMBING DRAWINGS FOR CONTINUATION

CONNECTION FOR EMERGENCY BOILER BACKUP

BOILER ROOM

TO WELL FIELD

ROOF MOUNTED COOLING TOWERS

ELECTRIC HEAT TRACING ON ALL OUTDOOR PIPE (TYP.)

TO NEAREST DRAIN

TO FLOOR DRAIN

TO/FROM CUP TERMINAL HEATING UNITS

TO/FROM CUP FAN COIL UNITS

TO/FROM CAMPUS

TO/FROM CAMPUS

8" CW DECOUPLING LINE

Prepared by Owner's on-staff Design professionals

Watchtower Bible and Tract Society of New York, Inc.
900 Red Mills Road
Wallkill, NY, 12589-3299
Tel: 1 (845) 306-3330
InboxHPR.US@jw.org

BR+A
105 Madison Ave
10th Floor
New York, NY 10016
www.brplusa.com

HPR headquarters project | ramapo

JW.ORG

REV	DATE	DESCRIPTION	ISS
10	10.25.22	INFORMATION	JB
9	08.05.22	SUBMISSION	NL
8	02.28.22	INFORMATION	NL
7	01.14.22	INFORMATION	AJT
6	11.18.21	INFORMATION	AJT
5	09.07.21	INFORMATION	AJT
4	04.07.21	INFORMATION	AJT
3	02.19.21	INFORMATION	AJT

Title: CHW & HW FLOW DIAGRAM

Project: CENTRAL ENERGY PLANT
Address: 155 STERLING MINE ROAD SLOATSBURG, NY 10974

Project no. 19009 Revision P10

Sheet M-601

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