

WORLD ENERGY RENEWABLES PROJECT

UTILITIES & OFFSITES
MECHANICAL EQUIPMENT DATA SHEET FOR 18-PK-1801 and 18-PK-1839
RENEWABLES AIR COMPRESSOR PACKAGE

DOCUMENT NUMBER: A8KM-UT-080-540655-A

Fluor Project No. : A8KM

FLUOR
IFP – Issued for Purchase
Apr 25, 2022

				HH	KW AAD NS JPK	03.7.	
D	21-Apr-2022	24	Issued for Purchase	HH	KW/AD/NS/JPK	BT	
C	4-Mar-2021	11	Issued for Quotation	HH	KW/AD/NS	BT	
B	7-Jan-2021	11	Issued for Client Review	HH	KW/AD/NS	BT	
A	16-Nov-2020	11	Issued for Review	HH	NS	BT	
REV	**DATE**	**PAGES**	**DESCRIPTION**	**ORIG.**	**CHKD**	**FLUOR**	**CLIENT**
						APPROVED BY	

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PACKAGED, INTEGRALLY GEARED CENTRIFUGAL AIR COMPRESSOR MECHANICAL EQUIPMENT DATA SHEET

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Item No:	18-PK-1801 / 18-PK-1839
Revision:	D Date: 4/21/2022
Unit:	Utilities & Offsites
P.O. No.:	A8KM-4-704-PO
Inquiry No.:	A8KM-4-704-RQ
Sheet:	2 of 24

REV: D

Client: World Energy Paramount Vendor: Ingersoll Rand

Service: Renewables Compressor Package Plant: World Energy Renewables Plant Site: Paramount, CA

Package Unit: ● Yes ○ No Manufacturer/ Type/ Model: Ingersoll Rand / Centrifugal / TA-3000 (MAC)

Information To Be Completed: ○ By Purchaser ☐ By Supplier ☒ By Supplier or Purchaser

GENERAL

Driver Splr.: TECO Driver Type: Electric Motor Rated: 1,000 BHP 3,600 RPM

Number Req'd: 2 x 100% Drive System: ○ Duty: ○

OPERATING CONDITIONS: Parallel Operation with Existing TA-2000 (C-1)

All Data on Per Unit Basis		Rated	Low Amb	Max Amb	Other
● Delivered Flow.	SCFM (14.7psia & 60°F dry)	3,222	3,222	3,222	
○ Weight Flow ○	lb/hr				
	lb/hr				
● Inlet Cooling Temp.	°F	80	80	80	
Inlet Conditions:					
● Pressure	psia	14.7	14.7	14.7	
● Temperature	°F	90	35	105	
● Relative Humidity	%	50	100	20	
● Molecular Weight	M	28.9 (Dry)			
☐ Inlet Volume: ○	cfm				
	cfm				
Discharge Conditions:					
● Pressure	psig	120	120	120	
☐ Temperature	°F				
Performance:					
■ Max BHP Req'd (All Losses Incl)		807	782	810	
■ BHP/100 cfm Air Delivered		22.5	24.7	22.2	
■ Input Speed	rpm	3,555	3,555	3,555	
■ Estimated Surge	SCFM @ abv. speed	1,920	1,950	1,920	
○ Max ΔP across Inlet Filter	psi				
■ ΔP included in calculation					
■ Aftercooler Outlet Temp.	°F	90	90	90	
☐ Performance Curve Number					
■ % Rise to Surge		43.4	44	43	
■ Guide Vane Angle		15.8	47.7	2.4	
■ Guarantee Point		X	**	**	

* Unthrottled performance for driver sizing

CONTROL SYSTEM

Control Method:

● Capacity Modulation (const. disch. press)
- ○ Inlet Throttle Device ○ Damper
- ○ Globe Valve ○ Butterfly Valve
- ● Variable Inlet Guide Vanes

○ Automatic Dual Control
- ○ Disch. Press. _____ to _____ psig

○ Automatic Start and Stop Pressure
- ○ Start _____ Stop _____ psig

○ Other (Describe): _____

Control System Requirements:

● Unit operates in Parallel
- ● w/ C-1, PK-1801 & PK-1839 (2 operating, 1 spare)

● Microprocessor capable of communication with purchaser's DCS
- ○ Comm Protocol _____

Control System Alternatives:

○ Other than Microprocessor based: _____

○ Suitable for Indoor Only

○ Furnished by Purchaser

INTER- AND AFTER-COOLERS

Aftercooler:

● Water-cooled Shell & Tube Heat Exchanger

○ Air-Cooled Intercoolers Req'd
- ● Furnished by Purchaser

☒ Air-Cooled Exchanger Automatic Temperature Control Means:
- ○ Louvers ○ Variable Speed Fans
- ○ Variable Pitch Fans ○ Bypass Valve

☒ Air-Cooler Control Manual Only by:
- ○ Louvers ○ Bypass Valve
- ○ Variable Pitch Fans

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Information To Be Completed: ○ By Purchaser ☐ By Supplier ☒ By Supplier or Purchaser

GENERAL

Driver Splr.: TECO Driver Type: Electric Motor Rated: 1,000 BHP 3,600 RPM

Number Req'd: 2 x 100% Drive System: ○ Duty: ○

OPERATING CONDITIONS: Parallel Operation with TA-3000 (PK-1801 & PK-1839)

All Data on Per Unit Basis		Rated	Low Amb	Max Amb	Other
● Delivered Flow.	SCFM (14.7psia & 60°F dry)	3,222	3,222	3,222	
○ Weight Flow ○	lb/hr				
	lb/hr				
● Inlet Cooling Temp.	°F	80	80	80	
Inlet Conditions:					
● Pressure	psia	14.7	14.7	14.7	
● Temperature	°F	90	35	105	
● Relative Humidity	%	50	100	20	
● Molecular Weight	M	28.9 (Dry)			
☐ Inlet Volume: ○	cfm				
	cfm				
Discharge Conditions:					
● Pressure	psig	120	120	120	
☐ Temperature	°F				
Performance:					
■ Max BHP Req'd (All Losses Incl)		586	583	584	
■ BHP/100 cfm Air Delivered		23.9	26.9	23.4	
■ Input Speed	rpm	3,555	3,555	3,555	
■ Estimated Surge	SCFM @ abv. speed	1,920	1,950	1,920	
○ Max ΔP across Inlet Filter	psi				
■ ΔP included in calculation					
■ Aftercooler Outlet Temp.	°F	90	90	90	
☐ Performance Curve Number					
■ % Rise to Surge		7	6.4	6.9	
■ Guide Vane Angle		63.1	65.9	62.7	
■ Guarantee Point		**	**	**	

* Unthrottled performance for driver sizing

CONTROL SYSTEM

Control Method:

● Capacity Modulation (const. disch. press)
- ○ Inlet Throttle Device ○ Damper
- ○ Globe Valve ○ Butterfly Valve
- ● Variable Inlet Guide Vanes

○ Automatic Dual Control
- ○ Disch. Press. _____ to _____ psig

○ Automatic Start and Stop Pressure
- ○ Start _____ Stop _____ psig

○ Other (Describe): _____

Control System Requirements:

● Unit operates in Parallel
- ● w/ C-1, PK-1801 & PK-1839 (2 operating, 1 spare)

● Microprocessor capable of communication with purchaser's DCS
- ○ Comm Protocol _____

Control System Alternatives:

○ Other than Microprocessor based: _____

○ Suitable for Indoor Only

○ Furnished by Purchaser

INTER- AND AFTER-COOLERS

Aftercooler:

● Water-cooled Shell & Tube Heat Exchanger

○ Air-Cooled Intercoolers Req'd
- ● Furnished by Purchaser

☒ Air-Cooled Exchanger Automatic Temperature Control Means:
- ○ Louvers ○ Variable Speed Fans
- ○ Variable Pitch Fans ○ Bypass Valve

☒ Air-Cooler Control Manual Only by:
- ○ Louvers ○ Bypass Valve
- ○ Variable Pitch Fans

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Sheet:	4 of 24

REV

LOCATION, SITE DATA

Location:

○ Outdoor ○ Unheated ○

○ ○

○ Winterization Required ○ Tropicalization Required

Site Data:

○ Elevation: 69 ft ○ Barometer: 14.7 psia

○ Range of Ambient Temperatures: 35 to 105 °F

	Dry Bulb	Wet Bulb
Normal		
Maximum	95	70
Minimum	35	

Unusual Conditions:

○ Dust ○ Fumes ○ Corrosive Conditions

○ Corrosives Present:

○ Conditions Cause Stress Corrosion Cracking

○ Other:

Area Electrical Classification: T-Code: T3

○ Class: 1 Group: B,C,D Division: 2

○ Non Classified

○ Local Electrical Codes: California Electrical Code

SPECIFICATIONS

Noise Specifications:

○ Max Allowable SPL at 3 feet: 85 dbA

○ Applicable Spec.:

○ Acoustic Housing: ○

Applicable Specifications:

○ API Standard 672

○ Others:

○ Non-ASME Welding if not AWS D1.1:

Painting:

● Supplier's Standard

○ Other:

Baseplate Grout: ○

Preparation for Grout Surfaces:

○

○ Other

Shipment: D

○ ○ Export Boxing Req'd

○ Outdoor Storage over 6 months

UTILITY CONDITIONS

○ **Steam Heating:**

Inlet Min:	psig	°F
Norm:	psig	°F
Max:	psig	°F
Outlet Min:	psig	°F
Norm:	psig	°F
Max:	psig	°F

○ **Electricity:**

	Heating	Control	Shutdown
Voltage	460	120	
Hertz	60	60	
Phase	3	1	

○ **Cooling Water:**

Temp. Inlet:	80	°F
Max Return:	120	°F
Press. Norm.	50	psig
Design:	120	psig
Min. Return	30	psig
Max Allow ΔP:	20	psig
Water Source:	Cooling Tower	

○ **Air/Nitrogen:**

Max. Pressure:	110	psig
Min. Pressure:	80	psig
Gas Composition:	Clean, Dry Instrument Air	

☐ UTILITY CONSUMPTION

Steam:

Oil Heater: lb/hr Other: lb/hr

Electric:

	Power HP	Locked Rotor Amps	Full Load Amps	
Main Lube Oil Pump	Shaft-Driven			D
Aux. Lube Oil Pump				

Oil Heater: 1500 W Space Heater: kW D

Control System Load: W

Cooling Water:

		L.O. Cooler	Inter-Cooler	After-Cooler	Other	Total	
Quantity	gpm						
Outlet Temp.	°F	< 120	< 120	< 120			D
Press. Drop	psi						D
Total CW	gpm		135				D

Air/Nitrogen:

	Inlet Pressure psig	Quantity scfm	
Seal System:		N/A	D
Control Panel:			
Lube Oil Reservoir:			D
Instrument Housing:		N/A	D
Control System:			D
Other: Cond. Pots, valves			D

Total Purge: < 35 scfm scfm D

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Sheet:	5 of 24

REV

CONSTRUCTION FEATURES

☐ **Compressor Speeds:**

Rated Input: 3,555 rpm Trip: ____ rpm

Bullgear Criticals: 1st ____ rpm

Pinion Criticals:

1st Stg. Pinion:	1st	rpm	2nd	rpm
2nd Stg. Pinion:	1st	rpm	2nd	rpm
3rd Stg. Pinion:	1st	rpm	2nd	rpm
4th Stg. Pinion:	1st	rpm	2nd	rpm

Other Undesirable Speeds: ____

	Stage Speed		Impeller Diameter		Tip Speed	
1st Stage:		rpm		in		ft/min
2nd Stage:		rpm		in		ft/min
3rd Stage:		rpm		in		ft/min
4th Stage:		rpm		in		ft/min

☐ **Impellers:**

No. of Impellers: 3 Material: ____

Type (Open, Radial,Backward Leaning, etc.): ____

Type Construction: ____

Method of Attach: ____

Rotation, Viewed from Input Shaft End: ☐ ____

☐ **Compressor Casing:**

Model: ____ Casing Split: ____

		Stg 1	Stg 2	Stg 3	Stg 4
Material					
MAWP	psig				
Hydro Test	psig				
Max Opt Temp	°F				

○ Minimum Design Metal Temperature: ____ °F

☐ Casing Heat Treatment Required

☐ Ultimate Stress for Material ____ psi

☐ Casting Factor ____

Welded Connections - NDT Provided

☒ 100% Radiograph ☒ Mag Particle ☒ Liq. Penetrant

○ ____

■ **Compressor Bearings & Bearing Housings:**

Bearing Housing Material: SAE 4340

Pinion Radial Bearings:

		Stg 1	Stg 2	Stg 3	Stg 4
Bearing Type					
Allow Load	psi				
Actual Load	psi				
Brg. Span	in				

Pinion Thrust Bearings:

		Stg 1	Stg 2	Stg 3	Stg 4
Bearing Type					
Allow Load	psi				
Actual Load	psi				
Thrust Collar					

■ **Integral Gear Housing:**

Material: Ductile Iron Split: at the horizontal CL of the shaft D

■ **Bull Gear**

Rated Power Based on Tooth Surface Durability: ____ hp

Rated Power Based on Tooth Bending: ____ hp

○ Min AGMA Service Factor: ____ ☐ Actual S.F. ____

Gear Rim Material: ____ Hardness: ____

Gear Face Width: ____ in

Gear Center Matl: ____

Mech. Efficiency: ____ % ISO1328 Grade: ____

Pitch Dia.: ____ in Pitch Line Vel.: ____ fps

☐ **Pinions**

	1st	2nd	3rd	4th
Service Factor				
Material				
Hardness BHN R_c				

D

☐ **Bull Gear Shaft:**

☐ ____

Matl: ____ Hardness: ____ BHN R_c

Brg. Span: ____ in Weight (w/Gear): ____ lb

Dia @ Gear: ____ in Dia @ Coupling: ____ in

Shaft Sleeves at Seals: Matl: ____

Shaft Labys: Type: ____ Matl: ____

Bull Gear Radial Brg. Type: ____ Length: ____ in

Allow. Load: ____ psi Actual Load: ____ psi

☐ **Bull Gear Thrust Bearings:**

Location: ____ Type: ____

Splr.: ____ Area: ____ in²

Thrust Collar: ☐ ____

Allow. Load: ____ psi Actual Load: ____ psi

Gas Load: ____ lb Coupling Load: ____ lb

Bearings Fitted with Temperature Sensors

○ Pinion Radial Bearing ○ Bull Gear Radial Bearing

○ Thrust Bearing: ____

☒ **Main Connections**

	Size	ASME Rating	Facing	Position	
Compr. Inlet	8"	125#	RF	Horizontal	D
Compr. Disch	4"	150#	RF	Vertical	D
Pkg. Outlet					
Atm. Blowoff					
Filter Outlet					

☐ **Other Connections:**

	Number	Size	Type
Lube Oil Inlet			
Lube Oil Outlet			
Cooling Water Inlet			
Pressure Gauge			
Temp. Gauge			
Condensate Drains			

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Sheet:	6 of 24		REV

Vibration Detectors

■ Type: Prox. Probes ☒ Model: 3300XL
● Splr.: Bently Nevada
● No. at Each Pinion Bearing: 2 Total No. 6
○ No. at Each Driver Bearing: Total No.
☐ X&Y Radial Probes can be Mounted Adjacent to Impellers for:
☐ 1st Stage ☐ 2nd Stage ☐ 3rd Stage ☐ 4th Stage

Oscillator-Demodulators:

● Splr.: Bently Nevada ☒ Model:
● Monitor Supplied by: IR
● Splr.: IR ☒ Model: Maestro
● Location: Local Panel Enclosure: NEMA 4X
☐ Readout Scale Range: ○ Alarm ☐ Set @ mil
○ Shutdown: ☐ Set @ mil ○ Time Delay sec
○ Per API 670

Bearing-Temperature Monitor

● Required ● Supplied By: IR ○ Per API 670
○ Splr.: ☒ Model:

Axial Position Movement Detector

☒ Type: ☒ Model:
○ Splr.:
☐ Readout Scale Range: ○ Alarm ☐ Set @ mil
○ Shutdown: ☐ Set @ mil ○ Time Delay sec

Dynamics:

● Critical Lateral Speeds are Proven by Prior Units
○ Damped Unbalanced Response Analysis Req'd
● Torsional Vibration Analysis of Train Req'd
○ Residual Unbalance Worksheet Req'd
☒ Notes:

Couplings:

Type: ■ Disk Pak ☒ Diaphragm ○ Other:
Disk Matl.: ■ Stainless Steel ☒ Coated w/
☒ Make: ☒ Model:
○ Non-Lube ○ Lub'd ☒ Lubrication:
☐ Spacer Length in ☒ Limited End-Float Req'd
☐ Cplg. Rating: hp/100 rpm @ 1 S.F. Actual S.F.
☐ Shaft Jct. Rating: @ Driver: hp
@ Input Shaft hp
☒ Mounting Arrangement @ Input Shaft:
@ Driver:
☐ Splr. Max Bore: in Proposed Bore: in
Driver Half - Cplg. Mounted by: ☒
☒ Idling Adapter for Driver Half Coupling Req'd

Piping Requirements:

■ Recmd'd Straight Run of Pipe before Suction: 6D
○ Supplier to Observe Flange Parting
○ Through Studs Required for Piping Flanges

Miscellaneous:

○ Supplier present during Initial Align Check
○ Supplier Check Align at Operating Temp.
○ Base Designed for Column Mounting
○ Thermal Relief Valves Provided by Supplier
○ For Water-Cooled Exchangers
○ For:
○ Purchaser Will Prepare Coordination Meeting Agenda

Shop Inspection and Tests:

● Advance Notification Req'd: Days

	Obsrv'd	Witns'd
● Shop Inspection		
● Hydrostatic	○	○
○ Combined test	○	○
● ASME PTC 10 Test (4 hour test with job motor)	○	●
Includes: Air Filter		
Aftercooler	Yes	
○ Guide Vane Test	○	○
○ At Non-100% Position		
○ Sound Level Test	○	○
○ Spare Rotor Test	○	○
○ Spare Rotor Mech Only	○	○
○ Impeller Overspeed Test	○	○
○ Post Ovrspd. Test NDE of Impellers	○	○
○ Residual Unbalance Check	○	○
○ Oil System Cleanliness	○	○
○ Control System Check	○	○
○ Brg., Seal, Gear Check	○	○
○ Gear Contact Check	○	○
○ Cleanliness Check - Vessels	○	○
○ Cleanliness Check - Piping	○	○
○ Hardness Check of Pinions	○	○
○ of Bull-Gear	○	○
○ of Weld Repairs	○	○
○ NDE of Major Repairs	○	○
○ Gear Tooth Mag-Particle	○	○
○ Final Inspection prior to Paint	○	○
● Inspection of Prep for Shipment	○	○
○	○	○
○	○	○

○ Prior Documentation on Major Repairs not Req'd
○ Retain Final Assembly Clearances
○ Submittal of Inspector's Checklist
Signed by Rep. for: ○ Purchaser ○ Supplier
If Design Requires Disassembly of Pinion for Brg. Inspection,
○

☐ **Weight:** lb

Integ Gear/Compr: Driver:
Gear Uppr. Case: Bull-Gear:
1st Stg. Pinion: 2nd Stg. Pinion:
Intercooler: Bundle:
Aftercooler: Bundle:
Base: Cntrl. Panel:
Max for Maintenance (Identify):
Total Shipping Weight:

☐ **Space Requirements:** in

	L:	W:	H:
Complete Unit:			
Control Panel: (if Sep.)			
Inlet Filter-Silencer:			
Aftercooler: (if Furn.)			
Other:			

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Sheet:	7 of 24

REV

LUBE OIL SYSTEM (NOTE 10) — D

Basic System Requirements - Normal Oil Flow

Lube Oil To:	gpm	psig	BTU/hr
☐ Compr/Gear			
☐ Driver			
☐ Ext Gear			

☐ Oil System Pressures:

Supply: _____ psig Pump RV Setting: _____ psig

Sys. Design: _____ psig Hydrotest: _____ psig

Oil Cooler:

		Shell Side	Tube Side
☐ Operating Press.	psig		
☐ Max Allow Working Press	psig		
☐ Max. Allow. Temp.	°F		
☒ Fouling Factor			

☐ Surface Area _____ ft² Duty _____ BTU/hr

☒ Removable Bundle to be Furnished

☐ ASME Code Stamped ○ Designed to TEMA: _____

☒ Tubes: No.: _____ O.D.: _____ in Length: _____ in

Wall Thickness: _____ in ☐ _____

☒ Materials:

Channels/Heads _____ Shell _____

Tubes _____ Tube Sheets _____

Channel Covers _____ Tube Supports _____

Oil Filters:

☒ Micron Rating: _____ ○ _____

☒ ΔP: psig Clean: _____ Dirty: _____ Collapse: _____

☒ Element: Make: _____ Model: _____

☐ No. Elements: _____ ☒ Media: _____

☒ Core Matl: _____ ☒ HSG Matl: _____

☐ HSG MAWP: _____ psig ☐ Max Allow Temp _____ °F

Oil Heater:

☒ Steam Heater Required ☐ Electrical Heater Required

☐ Rating _____ BTU/hr

☐ Watt Density _____ W/in²

Oil Reservoir:

☒ Retention Time: _____ min ☐ Capacity: _____ gal

☐ Free Surface Area: _____ ft² ☐ Internal Baffles

Lubricant: ☒ _____

☒ Description: _____

☐ Min Allow Oil Temp.: _____ °F _____ SSU

☒ System Component Suppliers:

	Supplier	Model
Main Pump		
Standby Pump		
Electric Motor(s)		
Steam Turbine(s)		
Oil Cooler(s)		
Oil Filters		
Accumulator(s)		
Suction Strainers		
Check Valves		
Transfer Valve(s)		
Pump Coupling		
Pump Relief Valves		
Electric Heater		

Pumps:	Main	Standby	
☒ Horizontal	X	X	D
☒ Vertical			
☒ Submerged			
☒ Motor Driven	X	X	D
☒ Turbine Driven			
☒ Shaft Driven			
☒ Centrifugal			
☒ Rotary	X	X	D
☒ Flange Connected			
☐ Rated Capacity gpm			
☐ Disch. Press. psig			
☐ BHP @ Max SSU			
☐ Driver Rating hp			
☒ Casing Material			
☐ Speed			
☒ Coupling	X	X	D
☒ OSHA Guard	X	X	D
☒ Mechanical Seal	X	X	D

Standby Pump Control Reset:

○ _____

SILENCERS (NOTE 11) — D

Inlet Air Filter/Silencer:

☐ Splr.: _____ Model: _____

☐ Description: _____

☐ Piping Connection: _____

☐ Clean ΔP, as Quoted: _____ psi

☒ Corrosion Protection: _____

○ Filter will be Remote Mounted by Purchaser at a Distance _____ ft from the Compressor

○ Filter will be Elevated _____ ft above Grade

Discharge Blowoff Silencer:

☐ Splr.: _____ Model: _____

☐ Description: _____

☐ Flange Connection: _____

Mounting: ☒ _____

Supported by: ☒ _____

☐ SPL (dBA) @ 3 ft. from Disch. of Silencer: _____

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PACKAGED, INTEGRALLY GEARED CENTRIFUGAL AIR COMPRESSOR MECHANICAL EQUIPMENT DATA SHEET

Document Number: A8KM-UT-080-540655-A

Contract:	A8KM
Item No:	18-PK-1801 / 18-PK-1839
Revision:	D Date: 4/21/2022
Unit:	Utilities & Offsites
P.O. No.:	A8KM-4-704-PO
Inquiry No.:	A8KM-4-704-RQ
Sheet:	8 of 24

REV

CONTROLS AND INSTRUMENTATION

Local Control Panel:

● Electrical Area Classification
Class: 1 Division: 2 Group: B,C,D

Panel Requirements:

☒ NEMA Type 4x Enclosure Matl.:
☒ NEMA Type 7 (Indoor Explosion-Proof for Hazardous Gas Areas) Required

Panel Features:

○ Vibration Isolators ○ Strip Heater ○ Internal Cooling
○ Weatherhood ■ Purge Connect's ○ Other:

Purge Requirements:

■ Instrument Air (D)
☒ Type X-Reduces the Classification from Div 1 to Non-Hazardous
☒ Type Y-Reduces the Classification from Div 1 to Div 2
■ Type Z-Reduces the Classification from Div 2 to Non-Hazardous
○ Tropicalization Required

■ **Instrument Suppliers:** Per WEP AML Rev. 5 (D)

	Supplier	Size and Type
Pressure Gauges		
Temperature Gauges		
Level Gauges		
Diff. Pressure Gauges		
Pressure Switches		
Temperature Switches		
Level Switches		
Pressure Transmitter	Rosemount	3051 (D)
Temperature Transmitter		
Level Transmitter		
Control Valves		
Pressure Relief Valves		
Thermal Relief Valves		
Temperature Control Valves		
Sight Flow Indicators		
Purge Flow Indicators		
Solenoid Valves		
Annunciator		
Tube Fittings		

Switch Closures:

Alarm Contacts Shall: ○ ____ To Sound Alarm and be Normally ○ ____
Shutdown Contacts Shall: ○ ____ To Trip and be Normally ○ ____
(Note: Normal Condition is when Compressor is in Operation)

○ Shutdown Systems are Not to be Provided with a Means to Permit Testing Without Shutting Down the Unit
○ Non-Shutdown Devices are Not Required to have Valving to Permit Replacement during Operation
○ Isolation Valves are Required for Shutdown Sensing Devices

Miscellaneous Instrumentation:

○ Through Flowing Instrument Sensing Line Required
○ Liquid Filled Gauges are Required for Areas Subject to Vibration
○ Relief Valves may have Bodies in Materials other than Steel ☒ RV Body Matl.:
○ Thermal Relief Valves Required for Components that can be Isolated
○ Flow Indicator Type/Material if other than Bulls Eye Type with Steel Body
○ Purge Required for Annunciator NFPA 496 Purge Type: ○
○ Combination Block and Bleed Valves may be Substituted
○
○

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P.O. No.:	A8KM-4-704-PO
Inquiry No.:	A8KM-4-704-RQ
Sheet:	9 of 24

REV

INSTRUMENTATION SCOPE OF SUPPLY

	Element											Indicator						
	Prov. by		Type			Location			Install by		Prov. by	Location						
	Supplier	Purchaser	Direct Readout	Switch	Transmitter (1)	Supplier Pkg.	Local Panel	Purch. Piping	Supplier	Purchaser	Supplier	Purchaser	Supplier Pkg.	Purch. Piping	Local Panel	Alarm	Shutdown	Repeat Signal (2)
Pressure:																		
Compressor Suction Stage																		
Compressor Discharge Stage																		
Lube Oil Discharge																		
Lube Oil Filter ΔP																		
Lube Oil Supply																		
Air Filter / Silencer ΔP																		
Temperature:																		
Compressor Suction Stage																		
Compressor Discharge Stage																		
Oil Cooler Inlet & Outlet																		
Compressor Pinion Journal Brg.																		
Bull Gear Journal Brg.																		
Bull Gear Thrust Brg.																		
Driver Journal Brg.																		
Driver Thrust Brg.																		
Reservoir																		
Level:																		
Lube Oil Reservoir																		
Separator																		
Vibration:																		
Radial Vibration Each Stage																		
Radial Vibration Bull Gear Shaft																		
Axial Position Bull Gear Shaft																		
Axial Position Stage Pinion																		
Radial Vibration on Driver																		
Axial Position on Driver Shaft																		
Accelerometer on Gear Box																		
Flow:																		
Oil Return																		
Seal Gas																		
Miscellaneous:																		
Standby L.O. Pump Running																		
Panel Purge Failure																		
Annunciator Purge Failure																		
Surge Recognition																		
Oil Heater On																		
Common Remote Alarm Indication																		
Common Remote Shutdown Indication																		

Notes: 1.) Transmitters Supplied by Supplier Shall Include Sensing Element

2.) Supply "Repeat Signal" for Control Room Also

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P.O. No.:	A8KM-4-704-PO
Inquiry No.:	A8KM-4-704-RQ
Sheet:	10 of 24

REV

(INTER-) (AFTER-) COOLER(S)

Service of Unit: _____ Item No.: _____

Size: _____ Type: _____ ☐ _____ Connected In: ☐ _____

Surf/Unit: (Gross/Eff) _____ / _____ ft² Shells/Unit: _____ Surf/Shell: (Gross/Eff.) _____ / _____ ft²

Performance of One Unit

		Shell Side		Tube Side	
○	Fluid Name				
☐	Fluid Quantity, Total lb/hr				
	Vapor - In / Out				
	Liquid - In / Out				
☐	Temperature - In / Out °F				
☐	Specific Gravity				
☐	Viscosity, Liquid cP				
☐	Specific Heat Btu/lb °F				
☐	Thermal Conductivity Btu/ft·hr·°F				
☐	Latent Heat Btu/lb °F				
☐	Inlet Pressure psig				
☒	Velocity fps				
☒	Pressure Drop - Allow / Calc psi				
☒	Fouling Resistance - Min. hr·ft²·°F/Btu				

☐ Heat Exchanged: _____ BTU/hr MTD Corrected: _____ °F

☐ Transfer Rate: Btu/hr·ft²·°F Service: _____ Clean: _____

☐ **Construction of One Shell** Sketch: Bundle Nozzle Orientations

			Shell Side		Tube Side	
Design/Test Press.		psig				
Design Temperature		°F				
No. Passes per Shell						
Corrosion Allowance		in				
Nozzles:		Inlet				
Size &		Outlet				
Rating		Vent-Drain				

Tube No.: _____ O.D.: _____ in Thk. - Min/Avg.: _____ / _____ in Length: _____ ft

Tube Pitch: _____ in ◁ 30° △ 60° ☐ 90° ◇ 45°

Tube Type: _____ Material: _____

Shell Matl.: _____ I.D. _____ O.D. _____ in Shell Cover Matl.: _____ (Integ/Remove)

Channel or Bonnet Matl: _____ Channel Cover Matl.: _____

Tubesheet - Stationary Matl.: _____ Tubesheet - Floating Matl.: _____

Floating Head Cover Matl.: _____ Impingement Protection: _____

Baffles - Cross Matl.: _____ Type: _____ % Cut (Dia.)(Area) _____ Spacing:C/C _____ Inlet _____ in

Baffles - Long Matl.: _____ Seal Type: _____

Supports - Tube.: _____ U-Bend: _____ Type: _____

Bypass Seal Arrangement: _____ Tube - Tubesheet Joint: _____

Gaskets - Shell Side: _____ -Tube Side: _____

- Floating Head: _____

ASME Section VIII Code Requirements: ☐ Design & Test ☐ Stamp ☐ Not Applicable TEAM Class: _____

Weight / Shell: _____ lb Filled w/ Water: _____ lb Bundle: _____ lb

Notes: _____

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Revision:	D Date: 4/21/2022
Unit:	Utilities & Offsites
P.O. No.:	A8KM-4-704-PO
Inquiry No.:	A8KM-4-704-RQ
Sheet:	11 of 24

REV

NEMA FRAME INDUCTION MOTORS TO IEEE 841

Splr.: Model: Serial No.: NEMA Frame:

Driven Equipment Type: Driven Equipment Item No.: Motor Item No.:

○ Operating Conditions

Site Data:

Electrical Supply: Volt: Phase: Hertz:

Electrical Area Classification: ○ Non Classified

○ Class: Group: Division:

Atmospheric Mixture:

Ignition Temperature: °F Temp Code:

Altitude: ○ Less Than: 3300 ft ○ ft

Ambient Temp.: Min.: °F Max.: °F

Unusual Conditions:

Drive System:

○

○ Other

Starting:

○ Full Voltage ○ Reduced Voltage: %

○

○ Voltage Dip %

☐ Performance

No Load Current, Amps:

Full Load Torque: ft·lb

Starts per Hour: Hot Cold

Acceleration Time: sec

Load	Current, Amps	Efficiency	Power Factor
Full			
75%			
50%			
Locked Rotor			

☒ Construction Features

Nameplate: hp RPM: S.F.:

NEMA Torque Design: ○

NEMA Locked Rotor kVA Code Letter:

Efficiency: ○

Noise Design: ○

○ Max Sound Pressure Level - dBA: @ 3 ft.

☐ Expected SPL - dBA: @ 3 ft.

Enclosure: ○

Mounting: ☒

☒

☐

Main Terminal Box Mounting Location: ☒

Fan: ☐ ○ Non-Sparking

Bearing Type: ☐

Bearing Lubrication: ☒

Grease Fitting: ☒ Plugged ○ Alemite ○ Other:

Bearing Shielding: ☐

Motor Rotation: (Facing End Opposite Shaft Extension)

☒

Insulation Class: ○

○ Non-Hygroscopic ○ Tropicalized

☒ Temperature Rise: (Default is 80°C above 40°C by Res @ 1.0)

°C Above: °C by @ S.F.

☒ Motor to be "Thermally Protected"

☒ Motor to be "Over Temp Protected"

☐

○ Space Heater Required ☐ Rated at: Watts

☒ Volt: Phase: Hertz:

☒ Max. Sheath Temperature: °C

○ Separate Junction Box for Space Heater Leads

Motor Thrust Load: ○ lb ○ None

Direction of Thrust: ○

☐ Motor Thrust Rating: lb

Testing

IEEE Testing: ○ Obs. ○ Wit. ○ Submit Cert'd Results

○ Special Testing:

Miscellaneous

Painting: ○ ○ Other

○

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ALLOWABLE PIPING FORCES AND MOMENTS

Orientation of	Compressor Inlet		Compressor Discharge		Package Outlet	
Forces and Moments	Force lb	Moment ft·lb	Force lb	Moment ft·lb	Force lb	Moment ft·lb
Axial						
Vertical						
Transverse						

NOTES

1. Air compressor package includes compressor, an air inlet filter, intercooler(s), aftercooler(s), and interstage and discharge condensate pots.
2. Spare compressor shall be capable to start up and achieve 100% capacity in 1 min.
3. Required net dryer outlet capacity is 4,095 SCFM net dry air. D
4. Downstream system design pressure is 150 psig .
5. The final design temperature is to be specified by vendor based on the highest possible temperature that can be specified without incurring additional cost to the equipment item.
6. Seismic and design loading shall be in accordance with project specification A8KM-PP-000-400002-A, and A8KM-PP-000-200001-A.
7. Latest revision of project document "Basic Engineering Design Data (BEDD)", A8KM-PP-000-100001A, shall be followed.
8. All parts welded to the shell, shall be made of the same material as the shell.
9. 3D model to be provided by vendor.
10. IR's standard Lube Oil System is being supplied. More details will be provided in the detail design engineering phase. D
11. IR's standard inlet air filter / silencer and discharge blowoff valve and silencer will be provided. More details will be provided in the detail design engineering phase. D

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INDUCTION MOTOR
MECHANICAL EQUIPMENT DATA SHEET

Document Number: A8KM-UT-080-540655-A

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Item No:	18-PK-1801-C01M / 18-PK-1839-C01M
Revision:	D Date: 4/21/2022
Unit:	Utilities & Offsites
P.O. No.:	A8KM-4-704-PO
Inquiry No.:	A8KM-4-704-RQ
Sheet:	13 of 24

Rev.

Client: World Energy Paramount | Vendor: Ingersoll Rand

Service: Renewables Compressor Package | Plant: World Energy Renewables Plant | Site: Paramount, CA

Package Unit: ● Yes ○ No | Manufacturer/ Type/ Model:

Information to be Completed: ○ By Purchaser ☐ By Supplier ☒ By Supplier or Purchaser | Applicable To: ○ Proposal ● Purchase ○ As Designed ○ As Built

Bold Italics **= Indicate the Standard's default selections - refer to Annex C for Datasheet Guide**

BASIC DESIGN - General

Applicable Standards (1.3.2; 2.0): ***North American (i.e., ANSI, NEMA)*** Use SI (metric) datasheets for International Standards (IEC, etc.)

Power / RPM ratings are specified by: ○ User/Project ● OEM ○ Other

Nameplate power rating (4.2.1.1): **1000** ● HP ○ kW Motor speed: RPM (Synchronous)

Nameplate Voltage/Ph/Hz rating (4.2.1.2): **4000** Volts **3** Phase **60** Hertz

Nameplate ambient temp. rating [4.3.1.1 b)]: ***40° C*** ● Other: **40** °C ○ Minimum rated operating ambient temp.(4.1.2): °C

Stator insulation class [4.3.1.1 a)]: ***Class F*** ● Other Class:

Stator temperature rise [4.3.1.1 b)]*: ***Class B*** ● Other: * (See underlined sentences in Datasheet Guide for this item)

Duty (4.1.2): ***Continuous*** ○ Other:

Max. sound pressure level @ 1 m. @ no load, full voltage/frequency on sine wave power (4.1.3; 4.1.4): ***85 dBA*** ○ Other: dBA

Voltage and frequency variations (4.2.1.3): ***Per NEMA*** ○ Other:

Motor power source: ***Sine Wave Power*** ○ ASD power (complete below section) ○ Solid state soft starter - complete data on page 6, line 8

Adjustable Speed Drive (ASD) conditions, if applicable (4.1.4; 4.1.5; 4.2.1.2.3, 4.3.1.2):

○ ASD only operation (4.2.4.5) ○ ASD+DOL start capability ○ ASD only w-bypass to utility power ○ ASD w-DOL start & bypass to utility

○ Variable Torque speed range: Min speed RPM ft-lb Max. speed RPM ft-lb

○ Constant Torque speed range: Min speed RPM Max. speed RPM ft-lb

○ Constant Power speed range: Max speed RPM ft-lb

ASD description and information affecting motor design (obtain from ASD Supplier; refer to Datasheet Guide)

ASD type / topology:

ASD output harmonics, describe and/or attach data (4.3.1.2):

ASD maximum voltage spike amplitude and rise-time at drive output (4.3.1.2.1): Volts @ microseconds

ASD Maximum common mode voltage (CMV) at drive output (4.3.1.2.2): Volts

Other ASD information / motor requirements:

Area Classification (4.1.8): ○ Nonclassified ● Classified as: Class **1** Group **B, C, D** Division **II** or Zone

Temperature code (T-code): **T3C** Autoignition temperature (AIT): °C

○ Other:

Site Data (4.1.2; 4.4.8.3; 4.4.10.4): Site ambient temperature: **104** Max **35** Min ● °F ○ °C

Minimum rated storage ambient temp.(4.1.2): ○ °F ○ °C Site elevation: **69** ft.

Relative humidity: **54** % Avg. % Min ○ Use this higher elevation for motor rating: ft.

Motor location: ○ Indoor Building temperature controlled: ○ No ○ Yes Controlled temp.: ○ °F ○ °C ○ Use for motor rating

● Outdoor Roof over motor: ● No ○ Yes ○ Offshore platform / similar marine environment [4.4.1.1 c)]

○ Seismic loading (4.4.2.2), IBC Zone: Importance Factor: ● Other seismic requirements: **See NOTE 1.1**

Unusual Site Conditions, Define:

○ Additional environment considerations, chemicals, etc. (4.1.2):

○ Abrasive dust protection for open enclosures [4.4.1.2.2 c)]:

○ Corrosive agents in environment, re: stress corrosion cracking (4.4.10.1.2):

Other: **1.1 See Project Specification A8KM-PP-000-400002-A for seismic loading and other design criteria.**

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INDUCTION MOTOR MECHANICAL EQUIPMENT DATA SHEET

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Unit:	Utilities & Offsites		
P.O. No.:	A8KM-4-704-PO		
Inquiry No.:	A8KM-4-704-RQ		
Sheet:	14	of	24

Rev.

Bold Italics **= Indicate the Standard's default selections - refer to Annex C for Datasheet Guide**

BASIC DESIGN - Enclosure, Mounting, Electrical system

Enclosure (4.4.1.2) ● Degree of Protection (4.4.1.2.1) IP **55** ● Method of Cooling (4.4.1.2.1) IC **611**

❍ WP-II (Weather Protected Type II) (4.4.1.2.2) ❍ WP-I (Weather Protected Type I) (4.4.1.2.2) ❍ DPG (Dripproof Guarded) (4.4.1.2.2)

Air filters: ***Required for WP-II (5.5.3)*** ❍ Provisions only for WP-I or DPG (5.5.2) ❍ Provide filters for WP-I or DPG (5.5.4)

Air filter capability (5.5.4): ***90% of particles ≥ 10 micron*** ❍ Other:

❍ Purchaser specified filters: Manufacturer: Type: Model:

Differential pressure device (5.5.5): ***Provisions required for WP-II*** ❍ Differential pressure switch (5.5.5) ❍ Combination switch / gauge

❍ Provisions only for WP-I or DPG (5.5.5) ❍ Differential pressure gauge (5.5.5)

❍ Purchaser specified device: Manufacturer: Type: Model:

Enclosure for motors rated 6kV and above: [4.4.1.1 f)]: ***TEFC, TEAAC, or TEAAC (IP44 or higher)*** or ❍ Use enclosure selected in line 2

● TEFC (4.4.1.2.3) ❍ TEPV (4.4.1.2.3) ❍ Other enclosure:

❍ TEAAC (4.4.1.2.3) Heat exchanger tube materials [4.4.10.8 a)]: ❍ Aluminum ❍ Alum. Alloy ❍ Copper ❍ Copper Alloy ❍ Other

❍ Stainless Steel 300 Series ❍ Stainless Steel 316 Series (req'd for offshore) [4.4.10.8 a)]

❍ TEWAC (4.4.1.2.4) Heat exchanger tube materials [4.4.10.8 b)]: ***90-10 Cu-Ni*** ❍ Other

Cooling water conditions ***per 4.4.1.2.4 a):*** ❍ Water & glycol solution ❍ Other cooling water conditions or chemistry (attach documentation)

Cooler location-orientation [4.4.1.2.4 c)]: ❍ Supplier decision ❍ Above stator ❍ Other

Cooler inlet-outlet location (facing NDE): ❍ Supplier decision ❍ Right side ❍ Left side ❍ Other

Tube construction [4.4.1.2.4 d); 4.4.10.8 c)]: ***Single tube*** ❍ Double tube ❍ Redundant coolers [4.4.1.2.4 b)]

Leak detection [4.4.1.2.4 c)]: ***Required*** For double tube coolers: ***inner tube leak detection required*** ❍ Outer tube detection also

Flow sensor with local indicator [4.4.1.2.4 g)]: ***Required*** ❍ Not required Relay contacts: ❍ Norm.Open (NO) ❍ Norm.closed (NC)

❍ Purchaser specified device: Manufacturer: Type: Model:

Cooler air inlet & outlet temperature sensor [4.4.1.2.4 h)]: ***Required*** ❍ Not required ❍ Same as winding ❍ Other

❍ Purchaser specified device: Manufacturer: Type: Model:

System of units for hardware (1.3.1): ❍ U.S. / North American Customary ❍ SI (Metric)

Hardware-fasteners material [4.4.1.1 c)]: ***Stainless Steel 300 series through M12 (1/2 in.)*** ❍ SS 316 series through 1/2 in. for offshore

❍ Provision for pre-start purging [4.4.1.1 e)]: Purchaser specified purge details:

Field piping connection sizes (4.4.3.1): ***Supplier std.*** ❍ Other:

Duct gaskets/bolts provided by (4.4.3.8): ***Supplier std.*** ❍ Other:

Auxiliary motor driven fans (4.4.10.6.3): ❍ Yes ❍ No Ph / Volts.: Phase Volts

Paint system: ***Supplier's paint system*** ● Purchaser specified paint system Paint system spec. no.: A8KM-PP-00-500520-A

Paint color: ***Supplier's paint color*** ❍ Purchaser specified paint color Define paint color and code:

Mounting: ● Horizontal foot mounted ❍ Horizontal flange mounted with feet ❍ Vertical foot mounted

❍ Vertical flange mounted ❍ Shaft down ❍ Shaft up ❍ Solid shaft ❍ Hollow shaft ❍ Non-reverse ratchet (NRR)

❍ Vertical Motor to carry thrust (if selected, complete applicable area of Bearing &/or Driven Equipment / OEM section, pg. 6, lines 39 and 40)

Flange type / bolt circle: ❍ Supplier decision ❍ Other:

❍ Other mounting requirements:

● Baseplate: furnished by (4.4.2.6): **Compressor Supplier** ❍ Soleplate: furnished by (4.4.2.6):

❍ Non-massive Foundation applies (4.4.6.1.3, 4.4.6.2.1.2), Description:

❍ Data for non-massive system dynamic analysis required from machine vendor per 4.4.6.1.3 a), b), c), d)

Electrical System: Primary power source **4160** Volts **3** Phase **60** Hertz Maximum ground fault Amps

Method of system grounding (5.6.2.3) ● Resistance ❍ Reactance ❍ Ungrounded ❍ Solid

3-Phase fault Current at machine terminals (5.1.2) MVA Let-through energy (5.1.2.1): I^2t (Ampere-squared seconds)

Min S.C. at motor bus [4.2.3.2 c)] MVA at V_{base} X/R ratio: Min.motor term. start voltage % rated

Other information:

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P.O. No.:	A8KM-4-704-PO			
Inquiry No.:	A8KM-4-704-RQ			
Sheet:	15	of	24	Rev.

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BASIC DESIGN - Bearings, Seals

Bearings: Horizontal machines

Bearing type: ***Hydrodynamic (4.4.7.1.1)*** ● Sleeve (4.4.7.1.1) ○ Tilting pad (4.4.7.1.1)

○ Bearing constant-level oilers required (4.4.7.2.2) Type: _____

○ Antifriction (4.4.7.1.3)

○ Other: _____

Trico oiler, minimum 8 oz size, wth positive level positioner not set screw)

Bearings: Vertical machines

Thrust bearing load [4.4.7.1.11 a)] Downthrust Momentary _____ lbs Upthrust Momentary _____ lbs

Continuous _____ lbs Continuous _____ lbs

○ Other: _____

Seals: ○ Special seals for gas purge [4.4.7.3 a)] ○ Non-conducting seals [4.4.7.3 b)]

Other: _____

BASIC DESIGN - Bearing Lubrication

Hydrodynamic Bearings: ***Ring type self lubrication (4.4.8.1)***

Type/viscosity of oil (4.4.8.5; 4.4.8.8; 5.1.4.2) ● Supplier decision ○ Other, define: _____

● Pressurized lube required (4.4.8.4) ● Common with driven equipment (4.4.8.5)

System supplied by (4.4.8.4): ● Driven equipment supplier ○ End user ○ Motor supplier ○ Other _____

Lube System to comply with API 614 (4.4.8.6): ○ Part 3 General Purpose ○ Part 2: Special Purpose ○ ISO 10438-1

Main oil pump driven by: ● Supplier decision ○ Separate, independent motor ○ Main motor shaft

Other lube system information: _____

○ Meet cleanliness requirements of API 614 for 5 GPM & above capacity (6.2.3.2)

○ Purge oil mist (4.4.7.4.1) (describe or attach requirements): _____

Antifriction Bearings: Grease type: ○ Supplier decision ○ Other _____

○ Pure oil mist (4.4.7.4.1; 4.4.7.4.5) ○ Oil mist ready or ○ Oil mist provisions only (bearing grease removal may be required - see guide)

Vertical Motor Bearings: Thrust bearing: ○ Supplier decision ○ Grease lubrication ○ Oil Sump lubrication

Guide bearing: ○ Supplier decision ○ Other: _____

Other: _____

SPECIAL CONDITIONS

○ Shaft and spider one piece forging for 4 or more poles [4.4.5.1.4; 4.4.5.1.2 b)]

○ Special lower vibration limits, define (6.3.3.12): _____

○ Efficiency evaluation factor (8.1.2), EF = _____ cost / kW C = _____ cost / KWH applied at _____ % of full load

○ Test method for expected and guaranteed efficiency data (8.1.3.f): _____

○ Local codes, define (4.1.8): _____

○ External loads imposed on motor enclosure when connected at installation site, define (4.4.4): _____

○ Special overspeed requirement (4.1.5, 4.4.5.2.7): _____

Other: _____

Notes / Other Requirements: **3.1 Main and auxiliary terminal boxes shall be NEMA 4X, 316 SS construction.**

3.2 Main terminal box projection shall extend at least 24" beyond the edge of common baseplate to facilitate bottom cable entry.

D

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INDUCTION MOTOR
MECHANICAL EQUIPMENT DATA SHEET

Document Number: A8KM-UT-080-540655-A

Contract:	A8KM			
Item No:	18-PK-1801-C01M / 18-PK-1839-C01M			
Revision:	D	Date:	4/21/2022	
Unit:	Utilities & Offsites			
P.O. No.:	A8KM-4-704-PO			
Inquiry No.:	A8KM-4-704-RQ			
Sheet:	16	of	24	Rev.

Bold Italics **= Indicate the Standard's default selections - refer to Annex C for Datasheet Guide**

ACCESSORIES

Heaters: ● Frame space heaters (5.4.1; 5.4.2; 5.4.3): Sheath material: ○ Supplier decision ○ Other:

or ● Single voltage design Operating voltage **120** Phase **1**

○ Dual voltage design Operating voltages ____ / ____ Phase ____

○ Bearing heaters (4.4.8.3): Operating voltage ____ Phase ____

● Main terminal box space heaters required: also see main terminal box section, page 5

For classified areas provide code and/or surface temp. (5.4.2): temp. max. Temp. code (from pg.1): **T3C** ***T3*** used for labeled heaters if not specified

Max. surface temp.: ____ °C (less than or equal to 80% of AIT on pg.1 for unlabeled heaters, ***160° C*** if AIT not specified)

Winding Temperature Detectors (5.2): ***RTD - Platinum, 3 Wire, 100 Ohms at 0°C (5.2.1.1)*** ○ Other RTD Material:

Required number per phase (5.2.1.2): ***Three (3)*** ○ Other ____ Wires: ____ Resistance: ____

○ Ground one (1) common lead each element in terminal box (5.2.1.2)

○ Thermocouples: Type: ____ No. per phase: ○ Other ____

Bearing Temperature Detectors (5.3): ***RTD - Platinum, 3 Wire, 100 Ohms at 0°C; One (1) Per Bearing for Hydrodynamic & Thrust Bearings (5.3.1)***

● Other qty. per bearing **2** ● Dual element Type ● Install per API 670 (5.3.1) ○ Ground one (1) common lead ○ Provisions only

○ Other RTD material: ____ Wires: ____ Resistance: ____ ○ Other info: ____

○ Thermocouples: Type: ____

○ Oil temp. indicators (dial thermometers) (4.4.7.1.16) Type: ____ ○ Alarm contacts Number of contacts: ____ ○ NO ○ NC

Location of terminations for bearing temp. det. (5.1.14): ○ Supplier decision ○ Terminal head ○ T-box ○ T-box with winding temp. det.

Antifriction bearings: ○ Use selections above when antifriction bearings are specified

Vibration Detectors (5.8)

Non-contact Shaft Probes (5.8.1):	**Motors operating at 1200 rpm and higher**		**Motors operating at less than 1200 rpm**	
Shaft probes (X-Y) (5.8.1):	***Provisions required***	○ Installed	○ Provisions	○ Installed
Phase reference probe (5.8.1):	***Provisions required***	○ Installed	○ Provisions	○ Installed
Number per bearing (X-Y) (5.8.2):	***Two (2)***	○ Four (4)	***Two (2)***	○ Four (4)
Provide two (2) axial-position probes for hydrodynamic thrust bearings at the thrust end (5.8.2):			***Provisions Required***	○ Installed

Probe lead protection (5.8.1.1): ***Conduit*** ○ Other: ____

Manufacturer of probes, oscillator-demodulator: ○ Supplier decision ○ Purchaser defined, type: ____

Probes provided by: ○ Supplier ○ Other: ____ Installed By: ○ Supplier ○ Other: ____

Oscillator-Demodulator By: ○ Supplier ○ Other: ____ Installed By: ○ Supplier ○ Other: ____

Location of terminations (5.1.14): ○ Supplier decision ○ In osc.-demodulators box ○ In sensor housing ○ Other: ____

Bearing Housing Seismic Sensors: Manufacturer: ____

Sensor: ○ Installed ○ Provisions only ○ Per API 670 (5.8.3) ○ Supplier decision ○ Purchaser defined: ____

Vibration switch: ○ Installed ○ Provisions only ○ Per API 670 (5.8.3) ○ Supplier decision ○ Purchaser defined: ____

Device provided by: ○ Supplier ○ Other: ____ Installed by: ○ Supplier ○ Other: ____

Define mounting / hole size if purchaser defines device: ____ If switch, type: ○ Manual reset ○ Electric reset

D.E. bearing Qty.: ____ Position(s): ○ Horizontal ○ Vertical ○ Axial ○ Other: ____

N.D.E. bearing Qty.: ____ Position(s): ○ Horizontal ○ Vertical ○ Axial ○ Other: ____

Location of terminations (5.1.14): ○ Supplier decision ○ Terminal box ○ Terminal head ○ In sensor housing

Other Monitors and Devices

○ Monitor to alarm for shaft grounding brush replacement (4.4.7.1.9) Describe: ____

○ Other monitors or devices: ____

Alarm and Control Switches (5.6.1): ***SPDT 10 Amp 120VAC & 125VDC*** ○ Other: ____

Auxiliary Equipment T-Boxes (5.1.4.1): Location of aux. boxes (facing non-drive end): ○ Left side ○ Right side ○ Other: ____

● Stainless Steel aux. boxes/encl. (5.1.4.1) Cond./cable entry (5.1.4.1, 5.1.13): ○ Bottom ○ Left or ○ Right side facing non-drive end

Accessory Equipment Wiring Outside Enclosure (5.1.11): ***Rigid Conduit*** ○ Other: ____

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Inquiry No.:	A8KM-4-704-RQ			
Sheet:	17	of	24	Rev.

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ACCESSORIES - Main Terminal Box (See NOTE 3.1 and 3.2)

Main Terminal Box (5.1.1): Box size: ~~***Minimum size is Type II per NEMA MG 1 Part 20***~~ ***with Copper Bus Bar & Standoff Insulators Required***

Other Size: ❍ Supplier decision for required accessories ❍ For shielded cable term. [5.1.6 e)] ● Other: **One Size Larger than NEMA MG-1 Type II**

Box location facing non-drive end: ❍ Left side ● Right side ❍ Other: _____ ❍ Thermal insulation [5.1.6 a)]

Cable enter from (5.1.4.1): ● Bottom ❍ Top ❍ Drive end side ❍ Non drive end side ❍ Quick disconnect studs or receptacles [5.1.6 f)]

Incoming conductor size: **TBD** Type **TBD** Insulation **TBD** Qty. per phase **TBD** ● Provision for purging [5.1.6 c)]

All phase leads In terminal box (4.3.6): ***Required 750kW (1000HP) and larger*** ❍ Provide in < 750kW (1000HP) ● Removable links [5.1.6 d)]

Copper bus joint plating [5.1.6 i)]: ❍ Supplier decision ● Silver ❍ Tin ❍ None ● Copper ground bus [5.1.6 k)]

● Insulated terminations and interior jumpers [5.1.6 m)] ❍ 6kV & up use insulated bus bar between stator windings and main terminals (4.3.9)

● Main t/box space heaters [5.1.6 b)]: ● Single voltage design Operating voltage **120** Phase **1**

Refer to page 4 for heater T-code, etc. or ❍ Dual voltage design Operating voltages _____ / _____ Phase _____

For the devices following below, the purchaser may make a Provide-Install selection; the default is ***Provide and Install by Supplier***:

	Provided By	and	Installed By
❍ Differential protection current transformers [5.1.6 h); 5.1.8; 5.6.3]			
Type: ❍ Self-balancing ❍ Full differential ❍ Window-Type ❍			
Accuracy class _____ Ratio _____ Quantity: _____			
❍ Surge capacitors [5.1.6 g); 5.6.2.1, 5.6.2.3]: ❍ Microfarads _____ ❍			
❍ Surge arresters [5.1.6 g); 5.6.2.2, 5.6.2.3]: ❍ kV Rated _____ ❍			
❍ Current transformers [5.1.6 h)] for phase current meter ❍			
Accuracy class _____ Ratio _____ Quantity: _____			
❍ Voltage transformers [5.1.6 j)] for voltage meter ❍ Fuses required ❍			
Accuracy class _____ Ratio _____ Quantity: _____			
❍ Partial discharge (PD) detectors [5.1.6 l), 5.6.4.1] ❍			

Describe required system: _____

PD t-box location (5.6.4.3): ***vertical outside surface of main t-box*** ❍ Other: _____

MISCELLANEOUS, SUPPLIER'S DATA

❍ Qty. special tools and lifting devices (4.1.11, 4.1.12, 4.4.2.14): _____ ❍ Proof of non-sparking, corrosion resistant fan (4.4.10.6.1)

● Separate nameplate with purchaser's information - list below (4.4.11.4) ❍ Electronic vibration test data - define digital format below (6.3.3.17)

Purchaser's Tag No. _____

Shipment (6.4.1) ❍ Domestic ❍ Export boxing ❍ Special shipping bearings [6.4.1 k)] ❍ Outdoor storage more than six (6) months (6.4.2)

Proposals (8.1) ❍ Typical drawings & literature with proposal (8.1.8) ❍ Purchaser defined efficiency method [8.1.3 f)]: _____

❍ Separate price for each test on datasheet page 7 (8.1.14) ❍ Packaged price for all tests on datasheet page 7 (8.1.14)

❍ Provide requirements for special weather & winterizing protection (8.1.15) ❍ Provide safe stall time calculation method and limits (4.2.4.3)

❍ Provide quote for supervision of installation and erection (8.1.17) ❍ Provide quote for start-up commissioning service (8.1.17)

❍ Materials to be identified with ANSI, ASTM, or ASME numbers (8.1.18): _____

Contract Data (8.3) ❍ Special identification for transmittals (8.3.2) Define below or specify where this information is to be found

Drawings (8.5) System of units for drawings / data (1.3.1): ● U.S. / N.Am. customary only ❍ SI (Metric) only ❍ U.S. (SI) ❍ SI (U.S.)

❍ Supplier to provide curve data in tabular format (8.5.1) Define preferred digital format : _____

❍ Quantities of documents & drawings, and documentation schedule (or define source for this information) (8.5.1): _____

❍ After purchaser review of drawings, quantity of certified drawings to be provided (8.5.2): _____

Instruction Manuals (8.7) ❍ Quantity of instruction manuals to provide (8.7.1) (typically supplied in digital format): _____

❍ Detailed instructions and photo's, etc. for disassembly and inspection of bearings and seals [8.7.4 c)]

❍ Photos showing machine assembly steps required; including each step of bearing assembly (8.7.5)

● Copies of applicable certifictions, including NRTL, material certications (including PMI), and other certifications for the machine(s) (8.7.6)

Define any/all certifications required, including materials: **Motor shall be UL Recognized.**

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Inquiry No.:	A8KM-4-704-RQ			
Sheet:	18	of	24	Rev.

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LOAD REQUIREMENTS AND STARTING CONDITIONS

Load torque and inertia requirements (4.2.2): ***Per NEMA MG 1 Part 20*** or ○ Per specified load curve & data (lines 25 and 26 below) [4.2.2.1 a)]

Design load curve condition: ● Unloaded (e.g. closed valve or damper) ○ Loaded (e.g. open valve or damper) ○ Partially loaded (e.g. min.flow)

Load re-acceleration required [4.2.2.1 b)]: ***NO*** ○ Yes Re-acceleration load data or curve no.: _____

If yes above, complete the following (4.2.3.5): Max time of voltage interruption _____ Seconds

Voltage at motor terminals during re-acceleration _____ Volts

Motor Starting (4.2.3): ***Starting with 80% of rated voltage at motor terminals (4.2.3.1)*** or ○ Other percent of rated voltage _____ %

○ Other starting method [4.2.3.2 a)]: ○ Autotransformer ○ Captive transformer ○ Reactor ○ Solid state soft starter ○ ASD

Other method % volts: _____ % If Soft Starter, define percent Locked Rotor current limit during acceleration: _____ %

○ Maximum Locked Rotor current other than in 4.2.4.4 a) (450 to 650%): _____ ○ % of Full Load amps or ○ Maximum amps

○ Determine starting capability per [4.2.3.2 b)]: Min. _____ Volts at motor terminals under _____ Amps Locked Rotor current

or [4.2.3.2 c)]: Min. _____ S.C. MVA and _____ X/R ratio with _____ base voltage and _____ % Rated volts at motor terminals

● Provide curves & data [8.1.3 a), b)]: ***at rated voltage & min.start conditions*** ○ Other: _____ % Volts ○ Other: _____

○ No. of consecutive starts other than Table 4 (4.2.4.1): With motor temperature at ambient: ***3*** ○ Other: _____

With motor temperature greater than ambient but less than rated operating temp.: ***2*** ○ Other: _____

○ No.of full voltage starts if more than 5000 required (4.2.4.1; 4.4.5.1.1): _____

Other: _____

DRIVEN EQUIPMENT INFORMATION - OEM DATA

Driven equipment: Tag no.(s): **18-PK-1801-C01** Description **Instrument Air Compressor** Location _____

Driven equipment mfgr.: Ingersoll Rand Type / Model no. TA-3000 RPM 3600

Driven equip. rotation ***viewed from non drive end of motor***: ○ Clockwise ○ Counterclockwise ○ Bi-directional

Required motor rotation ***viewed from non drive end of motor***: ○ Clockwise ○ Counterclockwise ○ Bi-directional Overspeed trip point (if applicable) (4.1.5) _____ RPM

Type of load: Centrifugal: ○ Pump ● Compressor ○ Fan ○ Other _____

Positive displacement: ○ Pump ○ Reciprocating compressor Compressor factor "C": _____

Maximum current pulsation per API 618 (4.2.3.6): ***40%*** ○ Other: _____ %

Provide crank-effort chart or torque-effort curve no. [8.1.3 g)]: _____

Load characteristics per (4.2.2.1): ***NEMA MG 1 Part 20*** ○ Other - provide load speed-torque curve no. [4.2.2.1 a)]: _____

Total driven equipment load inertia reflected to motor [4.2.2.1 c)]: Wk^2: _____ $lb\text{-}ft^2$ or GD^2: _____ $kg\text{-}m^2$ at: _____ RPM

○ Speed increasing or reducing gearbox [4.2.2.1 c)]: Ratio: _____ Note: affect on inertia to be included in total inertia above

Driver connection to load: ● Direct Coupled ○ Gearbox ○ V or cog belt Belt Ratio: _____

Motor shaft extension (4.4.5.1.9): ● Cylindrical fit ○ Taper fit ○ Integral flange

Coupling: Specified by: ○ Purchaser ● Driven equipment supplier ○ Motor supplier ○ Per API 671

Coupling manufacturer: _____ Type: _____ Model: _____

Supplied by: ○ Purchaser ● Driven equipment supplier ○ Motor supplier ○ Other: _____

Motor half coupling mounted by (4.4.9.4): (requires vibration test in 6.3.1.5)

○ Purchaser ○ Driven equipment supplier ● Motor supplier ○ Other: _____

Coupling inertia [4.2.2.1 c)]: Wk^2: _____ $lb\text{-}ft^2$ or GD^2: _____ $kg\text{-}m^2$ (To be included in total inertia above)

Mass moment of half coupling assy. [4.4.6.2.1.1 f)]: _____ $lb\text{-}ft^2$ or _____ $kg\text{-}m^2$ (For damped unbal. response analysis)

Center of gravity of half coupling assy., drawing reference or dimensions (6.3.5.3): _____

Other information: _____

Vertical pumps: Thrust bearing load [4.4.7.1.11 a)] Downthrust Momentary _____ lbs Upthrust Momentary _____ lbs

Continuous _____ lbs Continuous _____ lbs

Other information: _____

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P.O. No.:	A8KM-4-704-PO			
Inquiry No.:	A8KM-4-704-RQ			
Sheet:	19	of	24	Rev.

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ANALYSIS, SHOP INSPECTION, AND TESTS

❍ **(m)** Indicates line item is not required ◁ **(v)** Indicates line item applies to only one machine in a multiple machine application/order

● **(l)** Indicates Purchaser required line item ◀ **(t)** Indicates line item applies to all machines in a multiple machine application/order

Make selections in only one column for each item

	Required (6.1.3.3; 6.3.1)		Witnessed (6.1.3; 6.1.3.1; 6.3.1.1)		Observed (6.1.3; 6.1.3.2; 6.3.1.1)	
Coordination meeting (8.2)	●					
Design review (8.4)	❍					
Lateral critical speed analysis [4.4.6.2.1; 8.6.2 b)]	●					
Torsional analysis data (4.4.6.2.2) Analysis by:	❍					
Submit test procedures and acceptance criteria 6 weeks before tests (6.3.1.4)	❍					
Demonstrate accuracy of test equipment (6.3.1.15)	❍	◁	❍	◁	❍	◁
Stator core test (6.3.4.1)	❍	◁	❍	◁	❍	◁
Surge comparison test - required for all machines (6.3.4.2)	●	◁	❍		❍	
Special surge test of coils (6.3.4.2.1)	❍	◁	❍	◁	❍	◁
Power factor tip-up test (6.3.4.3)	❍	◁	❍	◁	❍	◁
Stator inspection prior to VPI (6.3.4.5)	❍	◁	❍	◁	❍	◁
Sealed winding conformance test (6.3.4.4)	❍	◁	❍	◁	❍	◁
Partial discharge test for machines 6kV and greater (6.3.4.6)	❍	◁	❍	◁	❍	◁
Rotor residual unbalance verification test (4.4.6.3.4)	●	◁	❍	◁	❍	◁
Unbalance response test with half coupling mass (6.3.5.3) (Purchaser must also select one of below)	❍	◁	❍	◁	❍	◁
❍ Purchaser to supply the contract motor coupling hub plus a mass moment simulator for half coupling spacer for test (6.3.5.3)						
❍ Other arrangement (Define here & refer to Datasheet Guide for this test):						
Vibration test with half coupling (6.3.1.5) (req'd if Supplier mounts cplg. 4.4.9.4)	●	◁	❍	◁	❍	◁
Inspection of equipment, piping for cleanliness before final assembly (6.2.3.3)	❍	◁	❍	◁	❍	◁
Routine test **- a**lways required for all machines (6.3.2)	●	◁	❍		❍	
Bearing dimensional & alignment checks before tests [6.3.2.1 k)]	❍	◁	❍	◁	❍	◁
Bearing dimensional & alignment checks after tests [6.3.2.1 l)]	❍	◁	❍	◁	❍	◁
Purchaser supplied vibration monitoring / recording (6.3.3.7)	❍	◁	❍	◁	❍	◁
Complete test (6.3.5.1.1)	●	◁	❍	◁	❍	◁
Includes: Efficiency, LR current, PF & torque, FL Current, FL Slip, BD Torque, Heat Run, Speed v. Torque, Noise test at NL						
DC high-potential test (6.3.5.1.2)	❍	◁	❍	◁	❍	◁
Rated rotor temperature vibration test (6.3.5.2.1) (If not using Complete test)	❍	◁	❍	◁	❍	◁
Bearing housing natural frequency test (6.3.5.4.1)	●	◁	❍	◁	❍	◁
Heat exchanger performance verification test (TEWAC enclosures) (6.3.5.5)	❍	◁	❍	◁	❍	◁
Overspeed test (6.3.5.6; 4.1.5)	❍	◁	❍	◁	❍	◁
Final rotating assembly clearance data storage [6.2.1.1 e)]	●	◁				
Material inspection (6.2.2) Radiographic test (6.2.2.2), define parts:	❍	◁	❍	◁	❍	◁
Ultrasonic inspection of shaft forging (4.4.5.1.8; 6.2.2.3.1)	❍	◁	❍	◁	❍	◁
Ultrasonic test (6.2.2.3.2), define parts:	❍	◁	❍	◁	❍	◁
Magnetic particle test (6.2.2.4), define parts:	❍	◁	❍	◁	❍	◁
Liquid penetrant test (6.2.2.5), define parts:	❍	◁	❍	◁	❍	◁
Hydrostatic test (6.2.2.6), define parts:	❍	◁	❍	◁	❍	◁
Certified data prior to shipment [8.6.2 a)]	❍	◁				
All required test and inspection equipment (6.1.4) ***provided by supplier***	❍ Other:					
Notes:						

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Inquiry No.:	A8KM-4-704-RQ
Sheet:	20 of 24

Rev.

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MOTOR SUPPLIER / MANUFACTURER PROPOSAL DATA

Manufacturer: TECO | Type / Model No.: | Frame size / Designation: 500

Qty. 1 | 1000 HP | 3600 RPM (Synch.) | 2 Poles | 4000 Volts | 3 Phase | 60 Hz

Full Load speed: | RPM | Insulation class: ***F*** | Temperature rise: | Class ***B*** | Service factor: ***1.0***

Enclosure: TEFC | Full Load torque (FLT): | ft-lb | Rotor inertia [8.1.3 c)]: | lb-ft² ○ Wk² ○ GR² ○ GD²

Locked rotor torque (LRT): | % FLT | Pull-Up torque (PUT): | % FLT | Breakdown torque (BDT): | % FLT

Calculated Expected Data [8.1.3 f)] at the following Loads: ○ For recip. comp., calc. eff. is based on pulsating current conditions from pg.6

Load Point	50%	75%	100%	Other: %
Efficiency	%	%	%	%
Power Factor	%	%	%	%
Current	Amps	Amps	Amps	Amps

Area Classification (4.1.8): ○ Nonclassified ○ Classified: Class | Group | Div. | or Zone

Autoignition temp: °C or Temp.code

○ Guaranteed efficiencies [8.1.3 f)] at % Load = % Test method [8.1.3 f)]:

Max. sound pressure level (4.1.3): ***85 dBA @ 1 m. No-Load, Full Voltge/Frequency, Sine Wave Power*** ○ Other: dBA

Motor power source: ***Sine Wave Power*** ○ ASD Power only ○ ASD only w-bypass to utility power ○ ASD + DOL start capability ○ ASD w-DOL start and bypass to utility power

○ Variable torque speed range: Min. speed RPM ft-lb Max. speed RPM ft-lb

○ Constant torque speed range: Min. speed RPM Max. speed RPM ft-lb

○ Constant power speed range: Max. speed RPM ft-lb ○ Avoiding lateral natural frequencies by at least 15% not practical over specified speed range (4.4.6.1.2)

Method of efficiency determination to be used [8.1.3 f)]:

Base frequency(ies) and harmonics assumed present in the supply waveform(s) [8.1.3 f)]:

Separately Powered Auxiliary Fan(s) (4.4.10.6.3): Driver Information (where applicable)

Quantity	Location	Encl.	HP	RPM	Volts	Phase	Hertz

TEAAC Heat Exchanger Tube Material [4.4.10.8 a)]:

TEWAC Heat Exchanger Requirements (4.4.1.2.4): Tube materials [4.4.10.8 b)]: ***90-10 Cu-Ni*** ○ Other tube material:

○ Cooling water conditions ***per 4.4.1.2.4 a)*** ○ Other cooling water conditions:

Bearings (4.4.7.1): ***Hydrodynamic (4.4.7.1.1)*** ● Sleeve (4.4.7.1.1) ○ Tilting pad (4.4.7.1.1) ○ Antifriction (horizontal) (4.4.7.1.3)

○ Antifriction thrust bearing (vertical) (4.4.7.1.5) ○ Hydrodynamic thrust bearing (vertical) (4.4.7.1.10)

Thrust bearing load capability [4.4.7.1.11 a)] Downthrust Momentary lbs Upthrust Momentary lbs

Continuous lbs Continuous lbs

Lubrication (4.4.8): ***Ring Type Self Lubrication (4.4.8.1)*** Machine bearings require pressure lube system ● Yes ○ No

● Pressurized lube system (4.4.8.4) ● Common with driven equipment (4.4.8.5) System supplied by (4.4.8.4): ● Others ○ Motor supplier

Type/viscosity of oil (4.4.8.5; 4.4.8.8; 5.1.4.2): Oil rings included ○ Yes ○ No

Oil requirements per bearing (8.1.4): Flow: GPM Pressure: PSI Volume: QTS

Heat loss to be removed per bearing: kW

Oil mist provisions (4.4.7.4) (see Guide): ○ Purge oil mist, hydrodynamic brg's ○ Pure oil mist, antifriction brg's ○ Oil mist ready, antifriction brg's.

○ Grease, Type: ○ Oil mist provisions only, a/f brg's.

Magnetic stator slot wedges used (4.3.10): ○ Yes ○ No

When enclosure pre-start purging is specified, vendor defined maximum allowable pressure [4.4.1.1 e)]:

Low ambient temperature precautions (4.4.10.4):

Special winterizing requirements (8.1.15):

Machine net weight (8.1.5): lbs

Special tools included in proposal (4.1.11, 8.1.13):

Machine proposed is in strict compliance with API 541 5th edition? (8.1.9) ○ Yes ○ No ○ List of applicable exceptions attached

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INDUCTION MOTOR MECHANICAL EQUIPMENT DATA SHEET

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Item No:	18-PK-1801-C01M / 18-PK-1839-C01M			
Revision:	D	Date:	4/21/2022	
Unit:	Utilities & Offsites			
P.O. No.:	A8KM-4-704-PO			
Inquiry No.:	A8KM-4-704-RQ			
Sheet:	21	of	24	Rev.

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❍ ***AS-DESIGNED*** ❍ ***AS-BUILT***

USER	0	APPLICATION	0
LOCATION	Renewables Compressor Package	SUPPLIER	0
PROJECT NAME	Yes	SUPPLIER REF. No.	0
SITE / PLANT	0	NUMBER of UNITS REQUIRED	0
		MOTOR TAG No.(s)	#REF!

MOTOR RATING - ELECTRICAL AND PERFORMANCE DATA

Quantity ____ Type / Model no. ____ Frame size / Designation ____ Motor power: ❍ Utility-Grid ❍ ASD

Nameplate power / RPM rating (4.2.1.1): ____ ❍ HP ❍ kW ____ RPM Full Load ____ RPM synchronous ____ Poles

Nameplate Voltage/Ph/Hz rating (4.2.1.2): ____ Volts (4.2.1.2) ____ Phase ____ Hertz

Insulation class [4.3.1.1 a)]: ***Class F*** ____ Temperature rise [4.3.1.1 b)]: ***Class B*** ____ Enclosure (4.4.1.2): ____

Full-Load torque (FLT) ____ ft-lb Percent FLT at: Locked-Rotor (LRT) ____ Pull-Up (PUT) ____ Breakdown (BDT) ____

Expected Data [8.1.3 f)] at the following Loads (100% Voltage):

Load Point:	Locked-Rotor	50%	75%	100%	Other: ____ %	Data is:
Efficiency:	____ %	____ %	____ %	____ %	____ %	❍ Calculated
Power Factor:	____ %	____ %	____ %	____ %	____ %	❍ Previously tested unit
Current:	____ Amps	____ Amps	____ Amps	____ Amps	____ Amps	❍ Tested this order

Guaranteed efficiency [8.1.3 f)] ____ % Efficiency at ____ % Load Efficiency determination test method [8.1.3 f)]: ____

For reciprocating loads [8.1.3 f)] ____ % Efficiency at ____ % Load with ____ % Current pulsation Max. current variation [8.1.3 g)]: ____ A

For motors operating on ASD power [8.1.3 f)]: Base frequency(ies) and harmonics assumed in the supply waveform(s) [8.1.3 f)]: ____

Curve No.'s [8.1.3 a), b)]: Speed-Torque ____ Speed-Current ____ Speed-Power Factor ____

When specified: Calculated rotor-response curve no. [8.6.2 b)]: ____ Acceleration curve No. ____

Acceleration time [8.1.3 d)]: At rated voltage: ____ sec. At minimum starting voltage/MVA: ____ sec. At ____ % Voltage ____ Sec

Thermal capacity / limit curve no. (4.2.4.2) ____ Rotor inertia - Wk^2 [8.1.3 c)] ____ $lb\text{-}ft^2$

Locked-Rotor withstand time, cold [4.2.4.2 a); 8.1.3 e)] at 100% Voltage ____ Sec at 80% voltage ____ Sec at ____ % voltage ____ Sec

Locked-Rotor withstand time, hot [4.2.4.2 b); 8.1.3 e)] at 100% Voltage ____ Sec at 80% voltage ____ Sec at ____ % voltage ____ Sec

Starting Capability (4.2.4.1): Consecutive successful starts with :

Locked-Rotor current at 100 % Voltage ____ Amps

Motor initially at ambient temperature ***3*** ____ Locked-Rotor current at 80 % Voltage ____ Amps

Motor temp. above ambient but not exceeding rated operating temperature ***2*** ____ Locked-Rotor current at ____ % Voltage ____ Amps

Wait time after all consecutive starts exhausted [4.2.4.2 d), e)]: With motor running ____ Minutes With motor stopped ____ Minutes

Max. Sound Pressure Level (4.1.3) ***85*** dBA @ 1 m., no-load ❍ Other: ____

Induction Motor Equivalent Circuit Data: Phase-to-Phase resistance ____ Ohms, @ ____ °F

____ kVA base at rated voltage and 77°F Subtransient reactance X"d ____ Total winding capacitance to ground ____ uF

Locked-Rotor at rated voltage:	Stator R		Rotor R		Magn R	
	Stator X		Rotor X		Magn X	
Rated load at rated voltage:	Stator R		Rotor R		Magn R	
	Stator X		Rotor X		Magn X	

Residual Voltage Open-Circuit Time Constant: Motor Only ____ sec. With Surge Capacitors ____ sec.

MOUNTING, WEIGHTS

Mounting: ❍ Horizontal foot mounted ❍ Horizontal flange mounted with feet ❍ Vertical foot mounted

❍ Vertical flange mounted ❍ Shaft down ❍ Shaft up ❍ Solid shaft ❍ Hollow shaft ❍ Non-reverse ratchet

Flange type: ____ Flange bolt circle diameter: ____

❍ Soleplate furnished with motor ❍ Baseplate furnished with motor ❍ Adapter plate furnished with motor

Weights: Motor net: ____ lbs. Stator ____ lbs. Rotor ____ lbs. Shipping ____ lbs.

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Sheet:	22	of	24	Rev.

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BEARINGS, HOUSINGS AND SEALS

Bearings: Type: ❍ ***Hydrodynamic (4.4.7.1.1)*** ❍ Antifriction (4.4.7.1.3) AFBMA number(s):

❍ Split sleeve (4.4.7.1.1) Drive end:

❍ Tilting pad (4.4.7.1.1) Non-drive end:

Hydrodynamic bearings: Oil rings included (4.4.8.1) ❍ Yes ❍ No

Bearing, drive end: Capable of self-lube ❍ Yes ❍ No Manufacturer Model / part no.

Bore diameter: Min in. Max in. Bore length in. Type

Design clearance with Shaft: Min in. Max in. Bearing loading: PSI

Bearing, non-drive end: Capable of self-lube ❍ Yes ❍ No Manufacturer Model / part no.

Bore diameter: Min in. Max in. Bore length in. Type

Design clearance with shaft: Min in. Max in. Bearing loading: PSI

❍ Special seals for gas purge [4.4.7.3 a)] ❍ Non-conducting seals [4.4.7.3 b)] ❍ Other seal type

Thrust bearing: ❍ Antifriction (4.4.7.1.5) ❍ Hydrodynamic (4.4.7.1.10) Bearing loading: PSI

Thrust bearing load capability (4.4.7.1.11) Downthrust Momentary lbs Upthrust Momentary lbs

Continuous lbs Continuous lbs

Position: ❍ Non-drive end ❍ Drive end Manufacturer Model / part no.

LUBRICATION SYSTEM

❍ ***Hydrodynamic Bearing Ring Type Self Lubrication (4.4.8.1)*** ❍ Constant-level oilers (4.4.7.2.2)

❍ Pressurized lube (4.4.8.1, 4.4.8.4) Oil rings provided: ❍ Yes ❍ No Bearings designed to operate w/o lube system: ❍ Yes ❍ No

❍ Common with driven eqpt. (4.4.8.4) System supplied by (4.4.8.4): ❍ Driven eqpt. supplier ❍ End user ❍ Motor supplier ❍ Other

❍ Motor only lube system Required / recommended type/viscosity of oil (4.4.8.5; 4.4.8.8):

Total bearing oil requirements (8.1.4): GPM PSI Heat loss to be removed per bearing kW

❍ Motor prepared for supplemental purge oil mist (4.4.7.4.1) Other lube system information:

❍ Antifriction bearings: ❍ Grease Type:

❍ Pure oil mist (4.4.7.4.5) ❍ Oil mist ready or ❍ Oil mist provisions only

Grease removal required before operation with oil mist? ❍ Yes ❍ No

❍ Vertical motor bearings: Thrust bearing: Guide bearing: Mfgr. recommended lubricant:

❍ Oil sump lubrication ❍ Oil sump lubrication Type/viscosity of oil:

❍ Grease lubrication ❍ Grease lubrication Grease type:

VIBRATION DETECTORS

❍ **Non-contact Shaft Probes (5.8.1):** Number per bearing: ***TWO (2) (5.8.1)*** ❍ Four (4) (5.8.2)

Shaft Probes: ❍ Provisions ❍ Installed Manufacturer: Model:

Phase reference probe (5.8.1): ❍ Provisions ❍ Installed Manufacturer: Model:

Oscillator-Demodulators: ❍ Provisions ❍ Installed Manufacturer: Model:

❍ **Bearing Housing Seismic Sensors (5.8.3):** ❍ Per API 670 (5.8.3)

Sensor: ❍ Provisions ❍ Installed Type: Manufacturer: Model:

Vibration Switch: ❍ Provisions ❍ Installed Type: Manufacturer: Model:

D.E. bearing Qty.: Position(s): ❍ Horizontal ❍ Vertical ❍ Axial ❍ Other:

N.D.E. bearing Qty.: Position(s): ❍ Horizontal ❍ Vertical ❍ Axial ❍ Other:

Recommended Vibration Settings: Alarm Shutdown Inches per sec. ❍ Other

Alarm Shutdown Mils. ❍ Other

Frequency of shaft resonance closest to operating speed: Hertz

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P.O. No.:	A8KM-4-704-PO			
Inquiry No.:	A8KM-4-704-RQ			
Sheet:	23	of	24	Rev.

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ACCESSORIES & SETTINGS

Heaters: Single voltage design: Dual voltage design (if specified):

	Operating voltage	kW	Phase	Operating voltages	kW	Phase	Sheath material
❍ Frame heaters (5.4.1; 5.4.2; 5.4.3):				/			
❍ Main t/box heaters:				/			
❍ Bearing heaters (4.4.8.3):				/			

Temperature Detectors:

Winding Temperature Detectors (5.2): ❍ ***RTD-Platinum, 3 Wire, 100 Ohms at 0°C (5.2.1.1)*** No.per phase (5.2.1.2): ***Three (3)*** ❍ Other

❍ Other RTD material: Wires: Resistance: No.per phase (5.2.1.2): ***Three (3)*** ❍ Other

❍ One common lead each element grounded in box. (5.2.1.2)

❍ Thermocouples: Type: No.per phase (5.2.1.2): ***Three (3)*** ❍ Other

❍ Other

Recommended Settings: Alarm: Shutdown:

Bearing Temperature Detectors (5.3): ***RTD - Platinum, 3 Wire, 100 Ohms at 0°C; One (1) Per Bearing for Hydrodynamic & Thrust Bearings (5.3.1)***

❍ Other qty. per bearing ❍ Dual element used ❍ Installed per API 670 (5.3.1) ❍ One (1) common lead grounded ❍ Provisions only

❍ Other RTD material: Wires: Resistance: ❍ Other info:

❍ Thermocouples: Type:

❍ Dial type thermometers (4.4.7.1.16): Type ❍ Alarm contacts Number of contacts ❍ NO ❍ NC

Antifriction bearings: ❍ Above selections applied to antifriction bearings

Recommended Settings: Alarm: Shutdown:

Enclosure Accessories

WP-II, WP-I, DPG/ODP (4.4.1.2.2) Air filters: ❍ Provided (5.5.4): ***Required for WP-II (5.5.3)*** ❍ Air filters not provided (5.5.4)

Filter capability (5.5.4): ***90% of particles > 10 micron*** ❍ Other ❍ Air filter provisions only (5.5.2)

Filter manufacturer: Type: Model:

Differential pressure device (5.5.5): ***Provisions Required for WP-II*** ❍ Provisions only supplied ❍ Device not provided

❍ Differential pressure switch provided (5.5.5): ❍ Differential pressure gauge provided (5.5.5) ❍ Combination switch / gauge provided

Device manufacturer: Type: Model:

Recommended Settings for Differential Pressure Switch: Alarm: Shut-Down:

TEAAC Enclosure (4.4.1.2.3) Heat exchanger tube materials [4.4.10.8 a)]:

TEWAC Enclosure (4.4.1.2.4) Heat exchanger tube materials [4.4.10.8 b)]: ***90-10 Cu-Ni*** ❍ Other

Tube construction [4.4.1.2.4 d); 4.4.10.8 b), c)]: ***Single tube*** ❍ Double tube

Leak detection [4.4.1.2.4 c)]: ***Required*** Double tube leak detection: ***Inner tubes only*** ❍ Outer also

Cooler location/orientation [4.4.1.2.4 c)]: ❍ Redundant coolers [4.4.1.2.4 b)]

Water flow (GPM): Max Min Water pressure (PSI): Max Min

❍ Flow sensor local indicator provided [4.4.1.2.4 g)] ❍ Provisions only Manufacturer: Type: Model:

❍ Relay contacts provided: ❍ Normally open ❍ Normally closed

High flow alarm set point GPM Low flow shutdown set point GPM

❍ Cooler air inlet & outlet temperature sensor [4.4.1.2.4 h)]: ***Required*** Manufacturer: Type: Model:

Sensor type:

❍ Cooling water conditions per 4.4.1.2.4 a] ❍ Water/Glycol solution ❍ Other cooling water conditions (purchaser specified)

When enclosure pre-start purging is specified, supplier defined max. allowable pressure [4.4.1.1 e)]:

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Sheet:	24	of	24	Rev.

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STATOR WINDING AND ROTOR REPAIR DATA

Stator Coil Information [8.6.2 d), reference Annex G]: Coil dimensional drawing no.: _____

Total copper weight: _____ lbs. Copper strand size: _____ Insulation: _____

Number of strands per coil turn: _____ Number of turns per coil: _____

Turn insulation description: _____

Ground-Wall insulation description: _____

Thickness turn insulation: _____ mils Thickness strand insulation: _____ mils Thickness groundwall insulation: _____ mils

Coil configuration: _____ Rows by _____ Columns

Finished coil dimension in slot, W x H x L (also give tolerances): _____

Total number of stator slots: _____ Winding throw: _____ Winding connection: _____

Slot filler description - thickness: Top _____ mils Side _____ mils Middle _____ mils Slot dimensions: _____

Slot wedge material: _____ Magnetic slot wedges: ❍ No ❍ Yes

Stator bore diameter: _____ Stress grading description if applicable: _____

Special end-turn racing: _____

Other: _____

Rotor Information: Total Conductor Weight: _____ lbs. Number of Bars: _____ Strand or bar size: _____

Conductor material: _____ Ring material: _____ Retaining ring alloy, if applicable: _____

Shaft material: _____ Ring dimensions premachining: _____

Notes:

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