1. SPECIFICATION OF STEAM TURBINE AND ACCESSORIES

1-1. Type of Steam Turbine :

Type :	:	Horizontal, impulse, multi-stage multi-valve, axial flow, condensing, extraction, geared. (Upper exhaust type)	
Manufacturer's model No.	:	C5-R9-ER	R2

1-2. Output :

Rated output : (at generator terminal)	:	6,360 kW	R2

1-3. Operating Conditions :

Speed (turbine/generator)	:	7500/1800 rpm	
Inlet steam pressure	:	600 PSIG	
Inlet steam temperature	:	653 deg.F	
Exhaust steam pressure	:	1.3 PSIA	R2
Max. 1st Extraction pressure Controlled Extraction	:	50 PSIG at turbine nozzle	
Max. Inlet flow	:	93,700 Lb/h	
1st Extraction flow	:	0 & 13000 to 50000 Lb/h	R1
Max. Exhaust steam flow	:	43,700 Lb/h	R1
		at 1.3 PSIA	R2

PERFORMANCE TABLE

OPERATION CASE			1	2	3			
			RATED	NORMAL	Low flow/High temp.			
Inlet steam								
Pressure	(PSIG)		600	600	600			R2
Temperature	(deg.F)		653	653	780			R2
Flow	(Lb/h)		93,700	81,500	37,000			R2
1st Extraction	(Controlled Extraction) at turbine nozzle							
Pressure	(PSIG)		50	50	50			R2
Temp	(deg.F)		298	298	-			R2
Extraction flow	(Lb/h)		50,000	43,500	0			R2
Exhaust press	(PSIA)		1.3	1.3	1.3			R2
Exhaust temp	(deg.F)		111	111	111			R2
Gland leakage	(Lb/h)	*App.*	220	220	220			R2
Exhaust flow	(Lb/h)	*App.*	43,480	37780	36780			R2
Generator power	(KW)		6,360	5370	2070			R2

REMARKS

1. Guarantee Point: Case1
2. The measured steam consumption figures are subject to a tolerance margin of ±2.5% for instrumentation and human errors.

1-4. Direction of Rotation : (Viewed from Turbine to Generator)

Steam turbine	:	C.W.
Generator	:	C.C.W.

1-5. Lubrication, Governor and control oil :

Type of lubrication	:	Forced lubrication
Lubrication oil pressure	:	14.2 psi.G
Control oil pressure	:	142.2 psi.G
Normal required oil flow		
Lube and trip oil	:	360 Lit/min
Control oil	:	100 Lit/min
Kind of oil	:	Turbine oil ISO VG46

1-6. Mechanical Design Condition :

Inlet steam section	:	825	psi.G	850 deg F	R2
1st Extraction steam section	:	71	psi.G	518 deg F	
Exhaust steam section	:	13	psi.G&F.V.	300 deg F	
Cooling water section	:	71	psi.G	176 deg F	
Instrument air section	:	150	psi.G	50 deg C	

1-7. Flange Size

				Nozzle orientation (Viewed from Turbine to Gene.)	
Steam inlet nozzle	:	200 mm	(8 inch)	RIGHT SIDE	(ASME 600Lb) R2
1st Extraction nozzle connection	:	250 mm	(10 inch)	DOWN	(ASME 150Lb) R2
Exhaust nozzle	:	1600 x 480 mm	(RECTANGLE)	Upper	(MFR's STD.)

1-8. Approximate Weight (Dry) :

Steam turbine with baseplate	:	20,000 kg
R. Gear with sole plate	:	8,500 kg
Oil unit	:	7,000 kg
Others	:	3,000 kg

1-9. Reduction Gear

Type	:	Horizontal, Single reduction. Double helical gear type
Service factor	:	API 1.1 (API 677)
Applied standards	:	JIS , AGMA
Quantity	:	One (1) set / One unit

1-10. Emergency Stop Valve

Type	:	Oil pressure operated type with steam strainer and limit switch for indication of closed position.
Quantity	:	One (1) set / One unit

1-11. Journal Bearing

Type	:	Plain metal type, forced lubricated
Quantity	:	Two(2) sets / One init

1-12. Thrust Bearing

Type	:	Multi-segment tilting pad type (Kingsbury type)
Quantity	:	One (1) set / one unit (Double side)

1-13. Speed Governor

Type	:	Electro-Hydraulic Governor
Model No./Mfr name	:	505 E / WOOD WARD (Single CPU)
Adjustable speed range	:	105-95% of rated speed (105% Max speed limit)
Speed regulation	:	4% as droop
NEMA CLASS	:	D

1-14. Overspeed Governor

Type	:	Mechanical eccentric trip weight & Electric signal from governor
Tripping speed	:	109 % of rated speed (Electric) 110±1% of rated speed (Mechanical)
Quantity	:	One (1) set / One unit

1-15. Governing valve :

Type	:	Bar lift and MULTI VALVE
Quantity	:	2 / One unit

1-16. Insulation and Jacketing

Turbine casing and emergency stop valve are insulated and jacketed to maintain jacket temperature below 167 deg F.

1-17. Coupling :

Coupling between turbine and R/gear	:	Flexible type	
Coupling between R/gear and generator	:	Flexible type	R1

1-18. Base Plate or Sole plate

Type		
for Steam turbine	:	Baseplate
for Reduction gear	:	Soleplate
for Genarator	:	Soleplate

1-19. Turning Device

Type	:	Electric(AC) motor driven, Combined of Cyclo & Bevel Gear or worm gear reduction, automatic engage and automatic disengagement.
Motor rating	:	Refer to attached utility list
Quantity	:	One (1) set / One unit

1-20. Oil Reservoir

Type	:	Steel plate fabricated type
Full capacity	:	3 minutes of normal required flow at least
Quantity	:	One (1) set / One unit

Reservoir is furnished with oil level indicator, drain valve, oil charging nozzle, gas vent fan .
Equipments, such as oil pumps, oil filters and etc., will be mounted on top of oil reserver.

1-21. Main Lube Oil Pump

Type	:	Gear type , driven by the shaft end of the reduction gear.
Capacity	:	1.1 times of required lube oil flow, as minimum.
Discharge pressure	:	71 psi.G
Quantity	:	One (1) set / One unit

1-22. Auxiliary Lube Oil Pump

Type	:	Gear type , driven by the AC motor, and mounted on top of oil reservoir.
Capacity	:	1.1 times of required lube oil flow, as minimum.
Discharge pressure	:	71 psi.G
Motor rating	:	Refer to attached utility list
Quantity	:	One (1) set / One unit

1-23. Main Control Oil Pump

Type	:	Trochoid, Gear or Screw type, mounted on base plate and driven by AC electric motor
Capacity	:	1.1 times required lube oil flow, as minimum.
Discharge pressure	:	156 psi.G
Motor rating	:	Refer to attached utility list
Quantity	:	1 set / One unit
(Trochoid type	:	Positive displacement type)

1-24. Auxiliary Control Oil Pump

Type	:	Trochoid, Gear or Screw type, mounted on base plate and driven by AC electric motor
Capacity	:	1.1 times required lube oil flow, as minimum.
Discharge pressure	:	156 psi.G
Motor rating	:	Refer to attached utility list
Quantity		1 set / One unit
(Trochoid type	:	Positive displacement type)

1-25. Emergency Oil Pump

Type	:	Gear type mounted on oil reservoir and driven by DC electric motor
Quantity	:	One (1) set / One unit

1-26. Oil Cooler
(Cleanliness factor : 85%)

Type	:	Shell and tube, fixed tube sheet type
Cooling water - Kind	:	Fresh water
- Quantity		Refer to attached utility list
Cooling Surface	:	100% of required area
Quantity	:	1 set(s)/one unit

1-27. Lube Oil Filter

Type	:	Duplex with change-over cock
Filtration	:	40 micron
Quantity	:	One (1) set / One unit (twin element)

1-28. Control Oil Filter

Type	:	Duplex with change-over cock
Filtration	:	10 micron
Quantity	:	One (1) set / One unit (twin element)

1-29. Oil Pressure Adjusting Valve

Type	:	Self acting type
Setting pressure		
-Lube oil	:	14 psi.G
-Control oil	:	142 psi.G
Quantity	:	1 lot / One unit

1-30. Gland Steam Condenser
(Cleanliness factor : 85%)

Type	:	Shell and tube, fixed tube sheet type with AC motor driven exhaust fan
Cooling water - Kind	:	Cooling Tower Water
- Quantity		Refer to attached utility list
Cooling Surface	:	100% of required area
Quantity - exhaust fan	:	1 set(s)/one unit
- condenser	:	1 set(s)/one unit

2. MATERIAL LIST

2-1. Stem Turbine

Turbine HP casing part	:	Cast Alloy steel
Exhaust casing part	:	Carbon Steel
Turbine rotor	:	Cr-Mo forged steel
Blades	:	Mo-13% Cr stainless steel
Nozzles	:	Stainless steel
Diaphragm	:	Carbon steel
Journal bearing	:	Carbon steel lined with babbit metal
Thrust bearing	:	Carbon steel lined with babbit metal
Bearing housing	:	Cast iron
Labyrinth packing	:	Ni-Pb-Bronze or stainless steel fin

2-2. Emergency Stop Valve

Body	:	Cast Alloy steel
Valve	:	Cr-Mo steel
Valve seat	:	Stainless steel
Strainer	:	Stainless steel

2-3. Governor Valve

Body	:	Cast Alloy steel
Valve	:	Stainless steel
Valve seat	:	Stainless steel

2-4. Reduction Gear

Casing	:	Cast iron
Pinion	:	Forged alloy steel
Wheel gear	:	Forged alloy steel
Wheel shaft	:	Alloy steel
Journal bearing	:	Steel lined with babbitt metal
Thrust bearing	:	Steel lined with babbitt metal

2-5. Oil Cooler :

Shell	:	Carbon steel
Tube	:	Copper
Tube sheet	:	Carbon steel plate
Water chamber	:	Cast iron or Carbon steel

2-6. Oil Pump

Casing	:	Cast iron
Rotor	:	Carbon steel

2-7. Oil Filter

Casing	-for Lube oil filter	:	Cast iron
	-for control oil filter	:	Carbon steel
Element	-for Lube oil filter	:	18-8 stainless steel
	-for control oil filter	:	Cartridge paper filter

2-8. Base Plate or Sole plate : Carbon steel plate

2-9. Piping

Pipe for inlet steam line	:	By other	
Pipe for extraction steam line	:	By other	
Pipe for condensate water line, if ar	:	Carbon steel (By other)	
Pipe for gland leakage line	:	Carbon steel (By other)	
Pipe for lube oil and control oil li	:	304 Stainless Steel for upstream of oil filter, Return 304 Stainless Steel for downstream of oil filter	R1

2-10. Gland Steam Condenser

Shell	:	Carbon steel
Tube	:	Aluminum brass
Tube sheet	:	Carbon steel plate
Water chamber	:	Carbon steel

4. SCOPE OF SUPPLY (for one unit)

1 set - Steam turbine proper
1 set - Turning device
1 set - Electric motor for Turning device
1 set - Emergency stop valve with steam strainer
2 sets - Multi type governor valve
1 set - Governor assembly
1 set - Overspeed governor device with hand trip device
2 sets - Hydraulic servo piston
2 sets - Output Coupling (Turbine - R.G. & R.G. - Generator)
1 set - Baseplate for turbine
1 set - Soleplate for reduction gear
1 set - Lagging cover and jacketing (for turbine proper)
1 set - Steam piping within Baseplate
1 lot - Drain valve for turbine
1 set - Gland Condenser with Gland Exhaust Fan
1 set - Oil reservoir
1 set - Drain valve for oil reservoir
1 set - Main lube oil pump with relief valve
1 set - Auxiliary lube oil pump with relief valve
1 set - Emergency oil pump with relief valve
1 set - AC motor for aux. lube oil pump, with coupling, and coupling cover
2 sets - Control Oil Pump
2 sets - AC motor for main & aux control oil pump with coupling & coupling cover
2 sets - Suction valve for control oil pumps
1 set - DC motor for emergency oil pump, with coupling, and coupling cover
1 set - AC motor starter R1
1 set - DC motor starter
1 lot - Non-return valve for oil line
1 set - Accumulator for control oil line
1 lot - Oil pressure adjusting valve
1 set - Lube oil cooler assembly
1 set - Duplex oil filter for lube oil line with change-over cock
1 set - Duplex oil filter for control oil line with change-ovedr cock
1 set - Solenoid valve for remote trip
2 sets - Sight glass for return oil from turbine bearing housing
1 set - Oil Heater
1 set - Oil piping (Pre-fabricated between oil unit & equipment)
(excluding welding, acid & painting at site)
1 set - Reduction gear
1 set - Sight glass for oil return from reduction gear
1 set - Turbine control panel
1 lot - Instrumentation
1 set - Sealing steam control valve along with controller & stop valve
1 set - Air assisted non-return valve for extraction steam lines

1 set	- Foundation bolts, nuts & shims for quotated equipmemets	
1 set	- Commissioning spare parts	
1 set	- Special tools	
1 set	- Expansion joint for Exhaust steam line (Exhaust piping is not included)	R2
1 set	- Surface Condenser	R2
1 set	- Steam Jet Air Ejector with inter/after cooler	R2
2 sets	- Condensate water pump with AC motor	R2
1 set	- Level Control Valve for Condenser Hotwell w/controller	R2
1 set	- Minimum circulation control valve	R2

1. SPECIFICATION OF SURFACE CONDENSER AND ACCESSORIES

1-1. Number of Set :

Quantity : : One (1) set / One (1) unit

1-2. Type of Surface Condenser

Type : : Horizontal, shell & tube, fixed tube sheet type

Water Box Type : *Divided*

1-3. Operating Conditions :

Condenser top vacuum	1.3	psiA		R2
Condenser steam flow	43700	Lb/hr		R2
Condensate water temperature	110.7	deg F		
Kind of cooling water	Cooling Tower Water			
Cooling water quantity	5284	GPM	(1200m3/hr)	R2
Cooling water inlet temperature	87	deg F		
Cooling water outlet temperature	102	deg F		
Cleanliness factor	85	%		
Hotwell retention time	> 1	minutes		

1-4. Construction Feature

Cooling surface area (100% area)	4,350	Ft2	(approx)	(404m2)	R2
No. of pass of flow	2				
Tube sheet distance	Later	inch	(approx)		
Outside diameter of cooling tube	0.75	inch			
Thickness of cooling tube	20	BWG			
No. of cooling tube	Later	pcs	(approx)		
Steam inlet nozzle	Later	mm	(RECTANGLE)		
Cooling water inlet & outlet nozzle	Later	mm	(Later inch)		
Condensate water outlet nozzle	Later	mm	(Later inch)		
Weight (Dry condition)	Later	kg	(approx)		
Weight (Operating condition)	Later	kg	(approx)		

1-5. Material

Shell	:	Carbon steel plate	
Tube sheet	:	Carbon Steel	
Tube	:	304 Stainless steel	R2
Water chamber	:	Carbon steel plate	

1-6. Standard Accessories : (for One (1) Unit)

1 set	-	Feed water valve
1 lot	-	Air vent valve for water chamber
1 lot	-	Drain valve for water chamber and hot well
1 set	-	Level indicator controller (air operating type)
1 set	-	Hotwell level control valve (air operating type)
1 set	-	Atomospheric relief valve
1 set	-	Special tools
1 set	-	Minimum flow control valve for Condensate Water Pump (air operating type)

1-7. Mechanical Design Conditions

1)	Shell side	:	13.00	psi.G & Full Vacuum
		:	300	deg F
2)	Tube side	:	71	psi.G
		:	176	deg F

2. SPECIFICATION OF AIR EJECTOR AND ACCESSORIES

2-1. Number of Set

Quantity : One (1) set / One (1) unit

2-2. Type of Air Ejector

Type : 2 stage, twin element, steam jet ejector

Condenser : Common type (one shell) for inter and after condenser

2-3. Operating condition

Condenser top vacuum	:	1.3	psiA
Extracted gas quantity Dry air	:	8.20	Kg/Hr
Extracted gas temperature	:	App. Later	°C
Inlet steam pressure	:	600	psi.G
Inlet steam temperature	:	653	deg F
Steam consumption	:	250	Kg/Hr
King of cooling water	:	Condensate water	
Cooling water quantity	:	Max 20.2	m3/hr
Cooling water inlet temperature	:	App. 110.7	deg F

R2

2-4. Construction Feature

Cooling surface area	:	App. Later	m2
Outside diameter of cooling tube	:	Later	mm
Thickness of cooling tube	:	Later	mm
Steam inlet bore	:	Later	mm (inch)
Cooling water inlet & outlet bore	:	Later	mm (inch)
Weight (Dry condition)	:	App. Later	kg

2-5. Material

Nozzle	:	Stainless steel
Diffuser	:	Carbon steel
Mixing chamber	:	Cast steel
Shell	:	Carbon steel pipe
Tube sheet	:	Carbon steel
Tube	:	Aluminum brass
Water chamber	:	Carbon steel plate

2-6. Accessories : (For One (1) unit)

1 lot	-	Steam inlet valve for ejector
1 set	-	Steam strainer
1 lot	-	Air vent valve for water chamber
1 lot	-	Drain valve for water chamber
1 lot	-	Suction valve for 1st stage ejector
1 lot	-	Discharge valve for ejector
1 lot	-	Foundation bolts and nuts
1 set	-	Special tools
1 set	-	Startup ejector with silencer

2-7. Mechanical Design Conditions

Condenser

Shell side	:	13	psi.G & Full vacuum
	:	248	deg F
Tube side	:	64	psi.G
	:	194	deg F

Ejector

Inlet steam section	:	711	psi.G
	:	668	deg F
Air suction section	:	13	psi.G & Full vacuum
	:	300	deg F

3. SPECIFICATION OF CONDENSATE WATER PUMP

3-1. Number of Set

Quantity	:	Two (2) sets / One (1) unit	

3-2. Type of Pump

Type	:	Centrifugal & Horizontal	

3-3. Operating Condition

Pumping liquid	:	Condensate water		
Liquid temperature		110.7	deg F	R2
Liquid specific gravity	:	1		
Capacity(Max)	:	27	m3/hr	
Discharge pressure	:	50.0	psi.G	
Suction pressure	:	1.3	psiA	R2
No. of stage	:	1		
Pump speed	:	2970	rpm	
N.P.S.H required	:	2	m	
Kind of driver	:			
For main pump	:	AC motor		
For auxiliary pump	:	AC motor		
Net weight	:	Later	kg	Including Driver

3-4. Drive

Kind	:	Electric Motor	
Type	:	T.E.F.C	
Electrical supply			
Voltage	:	AC 460	V
Cycle	:	60	Hz
Phase	:	3	
Pole	:	2	
Speed	:	App. 3570	rpm
Output		11	Kw

3-5. Material

Casing	:	Cast iron
Shaft	:	Stainless steel
Impeller	:	Stainless steel
Gland seal	:	Gland packing (conventional)

3-6. Standard Accessories : (for Two (2) pumps)

2 sets - A.C. motor with coupling and coupling cover

2 sets - Seal water inlet valve
2 sets - Base plate
2 sets - Foundation blots & nuts

3-7. Mechanical Design Condition

Sucion side	:	13.0 psi.G & Full vacuum
Discharge side	:	71.1 psi.G

HYUNDAI IDEAL
ELECTRIC CO.

MANSFIELD OPERATION
330 EAST FIRST ST
MANSFIELD OHIO 44902
PHONE (419) 522-3611
FAX (419) 522-9386
www.Hyundaiideal.com

6,360kW Generator Specification

Item #1

1 - Type "SAB" Horizontal Brushless Synchronous Generator(s) rated:

7950 KVA, 6360 KW, .80 P.F., 1800 RPM, 3 Phase, 60 Hertz, 13,800 Volts, wye connected, 6 leads 80^0C rise by resistance above a 40^0 C ambient, Class "F" insulation.

Unit to be for continuous duty cycle on Fincantieri steam turbine
Unit designed, built and tested to ANSI, IEEE and NEMA standards

Electrical Features:

1. Field suitable for excitation from brushless exciter
2. Six leads for differential protection
3. VPI insulation, complete stator. Two VPI cycles for the exciter windings.
4. Damper windings

Mechanical Features:

1. Two sleeve bearings, steel backed bracket mounted, suitable for forced feed lubrication from system furnished by customer. HIEC will provide oil in and oil out connections with oil piping header with flanged connections.
2. One bearing to be insulated to prevent shaft currents
3. Mechanical balance per NEMA standards
4. Capable of 125% speed without mechanical damage
5. Totally enclosed with top mounted air to water heat exchanger (TEWAC), including:
    a. Sound level not to exceed 85 dba measured at 3 feet at no load
    b. Stainless steel cooling tubes
    c. IP 55 enclosure
    d. Dual blowers such that the generator will be able to operate at full load with one blower out of service.
6. Provisions made to protect unit from corrosive environment (H_2S and coastal marine)
7. Shaft extension to be flanged

Accessories:

1. Bearing temperature detectors, one per bearing, RTD type, 100 ohm platinum
2. Two grounding pads on frame to be located diagonally opposite of each other
3. Space heaters with sheath temperature limited to 200^0C (T3)
4. Six stator temperature detectors, RTD type, 100 ohm platinum

MANSFIELD OPERATION
330 EAST FIRST ST
MANSFIELD OHIO 44902
PHONE (419) 522-3611
FAX (419) 522-9386
www.Hyundaildeal.com

5. Four air temperature detectors, to be provided in the air inlet and outlet locations for both the generator cooling air as well as the heat exchanger air.
5. Brushless exciter with redundant fused diodes
6. Permanent magnet alternator (PMA)
7. Main terminal box to include:
    a. Three CT's for generator differential protection
    b. One cross current CT
    c. Lightning arrestors
    d. Surge capacitors
    e. Space for stress cones provided by others
    f. Two Voltage transformers, fused type, stationary mounted
    d. Three CT's for transformer differential protection
    e. Three CT's for transducers
    f. Three CT's for generator protection relay
    g. Rupture disc
    h. Drain hole
    i. Space heater
8. Soleplates with mounting hardware (hold down bolts, shims and dowel pins
9. Vertical jacking screws
10. Rotor ground detection system with relay furnished loose for mounting in control panel
11. Furnish and mount vibration equipment, Bently Nevada probes, 2 per bearing located in the X-Y plane. HIEC to supply probes, proximitors, cable and terminal box.
12. Key phasor probe
12. Mounting of half coupling furnished by turbine supplier
13. Stainless steel accessory terminal boxes

1 - Factory witness testing per the specification requirements included
1 - Standard paint system (Ameron Amerlock II), finish color as decided by customer

Following items are included:

1. Compliance to API 546 with the exceptions noted on pages 6 & 7 of this specification.

2. Manifold piping with 150# raised face flange connections (stainless steel supply and return) with sight flow gauges in drains. Ashcroft dial type thermometers provided in each bearing drain.

3. Special tools defined as rotor removal kit:

4. Voltage regulator DECS 200 type with manual back-up, furnished loose for mounting by others.

5. Neutral grounding transformer and secondary resistor

HYUNDAI IDEAL
ELECTRIC CO.

MANSFIELD OPERATION
330 EAST FIRST ST
MANSFIELD OHIO 44902
PHONE (419) 522-3611
FAX (419) 522-9386
www.Hyundaildeal.com

Item #2

1 - Ideal Generator Instrument and Relay Cubicle for 6,360 KW, 13,800 V, 3 Phase, 60 Hz Generator. The Unit to be NEMA 12 enclosure, front access, bottom cable entry and to include the following components:

Generator Digital Meter, Electro Ind. , Shark
Generator AC voltmeter, 1% accuracy
Generator Frequency meter
Generator AC ammeter
Generator Power Factor Meter
Bus AC voltmeter
Bus frequency meter
Synchroscope
Two synchronizing lights
Three AC voltmeters
DC ammeter for exciter field
DC voltmeter for exciter field
Three current transducers with 4-20 MA output signal for EMCS
Var transducers with 4-20 MA output signal
Three current transducers with 4-20 MA output signal
Three voltage transducers with 4-20 MA output signal
Power factor transducer with 4-20 MA output signal
Frequency transducer with 4-20 MA output signal
Watt transducer with 4-20 MA output signal
Generator AC voltmeter switch
Three AC voltmeter switches
Synchronizing switch
Voltage regulator on/off switch
Voltage regulator raise-lower switch
Speed control switch
Generator circuit breaker control switch with two indicating
Emergency stop pushbutton
Primary Generator protection and monitoring relay, Multilin, Model G60 protection to include:
Overcurrent with voltage restraint, reverse power, loss of excitation, negative sequence, over/under frequency, over/under voltage, ground overvoltage, differential. Monitoring to include current, voltage, watts, vars, powerfactor, frequency, watthours, varhours, and communications to the PLC through a RS232 or RS485
Three Voltage balance relays, Type BE1-60
Synchronizing check relay, Type BE1-25
Lockout Relay, Type HEA with indicating light

MANSFIELD OPERATION
330 EAST FIRST ST
MANSFIELD OHIO 44902
PHONE (419) 522-3611
FAX (419) 522-9386
www.Hyundaildeal.com

Lockout Relay, Type HEA with indicating light
Mounting and wiring of Voltage regulator system, Basler DECS 200
Mounting and wiring of Rotor ground detection relay
Synchronizing and load control module, Woodward, Type DSLC
Ground bus
Space heaters with thermostat
Interior lighting with switch
Small wiring and miscellaneous accessories

Item # 3 Generator Instrument & Relay Cubicle

1. Temperature and Vibration Monitor, Bently Nevada, Model 3500 System
   Rack
   Power Supply
   Keyphasor Module
   Relay Module
   Proximity Monitor
   RTD Module
   Communication Gateway Modbus
   VGA Display Monitor

Item #4 Controls Options

1. Power System Stabilizer, Basler PSS-100 including metering software. Power system study, setting analysis and field programming is not included. This device requires a Basler DECS 200N. Additional cost for the DECS 200N is included in the quoted price:

Item #5 Spare Parts

1. Start-up / commissioning spare parts (generator), defined as:
   1. One set of exciter diodes, reverse and forward
   2. One surge suppressor
   3. One bearing RTD

2. Operating spares / two years (generator), defined as:
   1. One set of bearing liners with seals
   2. Two sets of exciter diodes, reverse and forward
   3. Two surge suppressors
   4. Two bearing RTD's
   5. Two CT's

3. Capital and Insurance Spares (generator), defined as:
   1. One set of bearing liners with seals

STEAM CONSUMPTION CURVE

STEAM CONDITION : 600psiG & 653degF & 1.3psiA