

**FIRE WATER PUMP
DIESEL ENGINE DRIVE
VERTICAL TURBINE**



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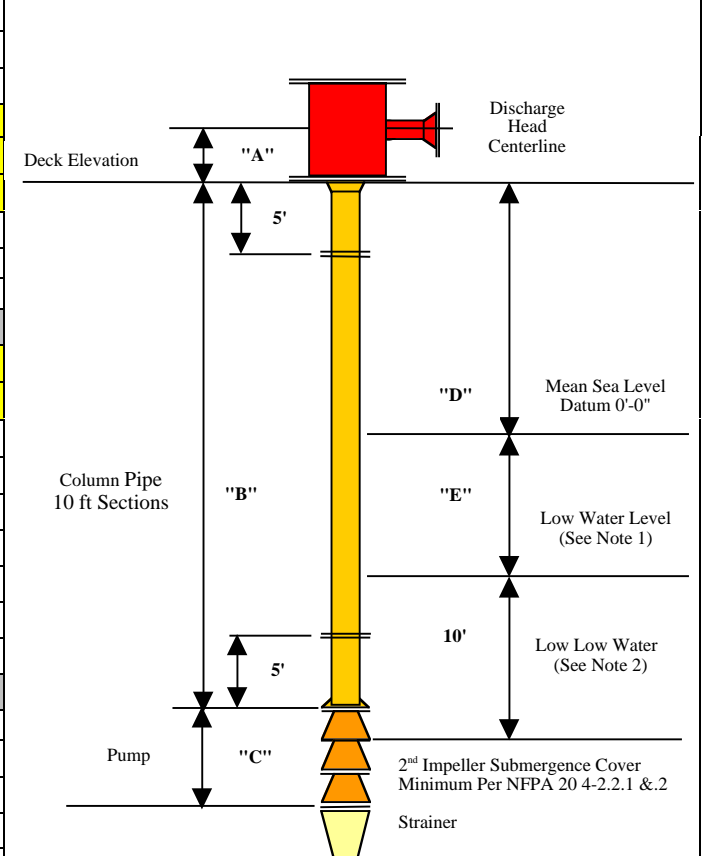
CLIENT:		PLANT:		No. of Pumps Req'd:	
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Site: _____
 Item Name: _____
 Pump Mfr.: _____

Driver Mfr.: _____ Motor: * _____ Furnished By: _____
 Engine: * _____ Furnished By: _____
 Gear: * _____ Furnished By: _____

GENERAL			
Applicable Specs:	* NFPA 20	* AWWA-E101-77	* UL448
Applicable Specs:	* AWS D1.1	* ANSI B31.3	* AISC
Environment:	* Indoors	* Outdoors	* Other
Amb. Air Temp: °F	Win/Sum ____/ ____	Specific Gravity	_____
Protection Req'd:	* Winterization	* Tropicalization	
Water Temp. °F	* Surface ____ °F	* Bottom of Casing ____ °F	
Pump:	* Vertical	* Diesel Dr.	* Motor Dr.

PUMP ELEVATION



PUMP PERFORMANCE			
Proposed Curve No.:		Min flow thrust	Lbs-dn
Design (100%) Flow:	gpm	RO (150%) Flow:	gpm
TRH @ 100% Flow:	ft.	* TRH @ 150%:	ft.
* Min. Flow @ 50% Flow:	gpm	* Shutoff Head:	ft.
* NPSHa @ 150% Flow:	ft.	* NPSHr @ 150%:	ft.
* 100% Flow, shaft HP	hp	* Max. shaft BHP:	hp
* Speed @ 100% Flow:	rpm	* Eff. @ Max HP:	%

PUMP CONSTRUCTION			
* Size:		* Rating:	
Bowls:	ASTM B-148 Ca958 NiAlBz	Bowl Shaft:	Nitronics-50
Impellers:	ASTM B-148 Ca958 NiAlBz	Type:	Semi-Open
Imp. Collets:	Chrome Plated 316SS	Line Shaft:	316SS
Pump Bolting:	K-Monel	Shaft Bearings:	Fluted Rubber
Bowl Bearings:	Bronze	Bearing Ret'r:	B148 Ca958
Suction Bell:	ASTM B-148 Ca958 NiAlBz	Disch. Hd.:	Fab Steel
Strainer:	ASTM B-148 Ca958 NiAlBz	Stuffing Box:	316 SS
Column Pipe:	Badenoch Bronze/NiAlBz	SB.Shaft Sleeve:	316 SS

- Notes:
 1. LWL must equal Low Astronomical Tide or other Client LWL Criteria below LAT.
 2. LLW must also provide for minimum submergence of NPSHr to be verified by FPCo.

COLUMN PIPE			
Material:	BADENOCH-BRONZE	Form:	Wrought 5%Ni - 10% Al - 82%Cu
Length:	* Overall: _____	* 5ft. Top	* 10ft Common
Column Pipe Flanges:	* Parallel & Concentric, face & register (TIR = .003"/10Ft)		
Column Pipe to Discharge Head Connection:	* Micarta Insulation Gasket Kit:		
Column Pipe Flange Bolting:	316SS	* Option 400 Monel	* _____

PUMP COMPONENT DIMENSIONS

ITEM	DESCRIPTION	*By FPCo	By Client
A	Discharge Height Above Deck	' "	
B	Column Pipe Overall Length	' "	
C	Pump Length	' "	
D	Deck Elevation Above MSL		(+)' "
E	LWL Below MSL		(-)' "

DISCHARGE HEAD			
Column Pipe to Discharge Head Connection:	* Material: Fabricated, * CS * 316SS w/ ____ in. * RF or * FF disch. nozzle		
Column Pipe Flange Bolting:	* Hempel 163U baked-on phenolic epoxy coating (5 to 8 mils) inside.		
	Threaded connections: * 316SS full penetration couplings seal welded inside and out.		
	316SS Stuffing Box: * Sn/Pb bushing, 316SS bolt'g, braided graphite-filament packing.		
	Guard: * 316SS expanded metal OSHA guard		

REVISION	ISSUE STATUS	DATE	BY	CHK'D	APP'D

DIESEL ENGINE DRIVER			
* Model:	* T.C.	* T.&A.	* Nat. Asp

FIRE PUMP CONTROLLER			
Manufacturer:	W-Industries	Model:	FPCo standard

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Label: UL/FM Basic	* Engine Modifications: <input type="checkbox"/> Yes / <input type="checkbox"/> No	Type: Pneumatic	Enclosure: Nema 4X	316 SS
* UL/FM HP: hp @ rpm		Area Classification: <input type="checkbox"/> Hazardous <input type="checkbox"/> Non-Hazardous		
* Site HP: hp @ rpm	<input type="checkbox"/> Corrected for Temp/Elev.	Instrument Air Supply: -40°F Dew point	Pressure: 60 psi Minimum	
* No. of Cylinders: Engine Displacement: In ³		Remote Signals: <input type="checkbox"/> Pneumatic <input type="checkbox"/> Electric <input type="checkbox"/> Div I <input type="checkbox"/> Div II		
* Non-labeled: Max. BHP with 10% Deduction @ rpm		Control Valves & Instrumentation: <input type="checkbox"/> Sea Water Trim <input type="checkbox"/> 316SS		
* Bare Engine Weight: Lbs		Timing Devices: <input type="checkbox"/> Primary Kuhnke or equal <input type="checkbox"/> Secondary Volume bottle		
Mech Noise Level @ 1mtr: dBa (req'd) _____ * dBa (estimated) _____		Panel Mount Instmts: <input type="checkbox"/> Tech/Hr Meter <input type="checkbox"/> Water Temp <input type="checkbox"/> Oil Gauge		
Drive end view rotation: <input type="checkbox"/> Clockwise <input type="checkbox"/> Counter Clockwise		Panel Mount Alarms: <input type="checkbox"/> 105% Overspeed <input type="checkbox"/> 110% Overspeed <input type="checkbox"/> Water Temp		
Heat Exchanger: Shell & Tube Type with 90/10 cu/ni tubes & Di-electric anode.		<input type="checkbox"/> Hi-press medium low <input type="checkbox"/> Oil Pressure <input type="checkbox"/> Start Failure <input type="checkbox"/> Fuel Level		
Ht. Exch. Conn: Brz bellows, wire braided flex with Di-electric insulation				
Ht. Exch. Waste: Engine & gear piping w/flex to skid perimeter Waste Cone				
* Cooling Water Req'd @ Max HP: gpm, provided by Ft of Head				
* Fuel Consumption: gph @ Hp		CONTROL & STARTING MEDIUM STORAGE SYSTEM		
Cooling Loop: <input type="checkbox"/> Sch. 40, 90/10 cu/ni pipe with bronze fittings and instruments		ASME Vessel Mfr: Roy E. Hanson	<input type="checkbox"/> USCG	<input type="checkbox"/> ABS Certificate
Combustion Air shutoff <input type="checkbox"/> Auto @5-10% overspeed <input type="checkbox"/> Manual or <input type="checkbox"/> Both		Design Pressure @ 100°F: MAWP, 300 psi	MAOP: 275 psi	Normal W.P. 230psi
Exhaust Man. & Turbo: <input type="checkbox"/> Dry Type Insulation: <input type="checkbox"/> Yes / <input type="checkbox"/> No		ASME Vessel Volume: 26.8 cuft/200 gal.	* Total engine crank duration: sec.	
Lube Oil Drain: <input type="checkbox"/> w/ lockable valve piped or tubed to skid perimeter		Hi-Pressure system Volume bottles: 330 scf @ 2400 psig cylinders, DOT approved		
Pneumatic Switches: <input type="checkbox"/> Speed <input type="checkbox"/> Water Temp <input type="checkbox"/> Oil Press <input type="checkbox"/> Crank terminate		System Charging Medium Compressor: <input type="checkbox"/> Electric (1) <input type="checkbox"/> Pneumatic		
Detection System: <input type="checkbox"/> API 14C detection elements provided by others		* Air Dryer Sys option: <input type="checkbox"/> Yes / <input type="checkbox"/> No (Req'd if instrument air is unavailable) (2)		
		Power Available for Electric System: <input type="checkbox"/> Yes / <input type="checkbox"/> No (See Client Supplied Data)		
		* 180sec Starting medium storage will be provided at _____ °F minimum ambient temp.		
		* 180sec Starting Duration available @ initial DOT cylinder pressure of _____ psig.		
		* Start duration available per cylinder: _____ sec x _____ cylinders = _____ seconds		
TURBOCHARGER (when equipped)				
Type: Water-cooled in Div I & II areas: <input type="checkbox"/> Yes / <input type="checkbox"/> No		Black Start Pressurization: 3-6 hrs	Recharge after engine start attempt: 10-15 min	
Div I & II areas: <input type="checkbox"/> Insulate non W.C. areas with 1" 11-lb./sqft 1200° F fiberglass mat		ASME vessel conn w/valves: <input type="checkbox"/> Inlet/outlet 1" <input type="checkbox"/> PSV 1" <input type="checkbox"/> Drain " <input type="checkbox"/> 0-600 PSI		
		Gauge w/Blk & Bld <input type="checkbox"/> Hi Press supply " <input type="checkbox"/> Inspection Holes 2 @ 2" NPT plug		
		Hi pres system Regulator: Cryogenic Service Required	Capacity: 30,000 scfh	
EXHAUST SILENCER				
Manufacturer: Donaldson	Model: 202-2100-2 (Industrial spark arrest)			
* Connection Size: 125 lb - _____ in.	Type: FF ASA Flange			
Div I & II areas <input type="checkbox"/> Optional 1" 11-lb./sqft 1200° F fiberglass mat insulation.		ENGINE STARTER		
Industrial Grade silencer <input type="checkbox"/> Yes <input type="checkbox"/> No	Ave. Attenuation 12 to 20 dBa	Manufacturer: TDI	* Model: T30 or T100	
Residential Grade option: <input type="checkbox"/> Yes <input type="checkbox"/> No	Ave. Attenuation 18 to 25 dBa	Required Pressure: 30/60 psig	* Consumption rate: SCFS	
		Ambient Temp: (3) 40°F minimum	Optional for below 40°F: <input type="checkbox"/> Yes <input type="checkbox"/> No	
		Start Valve: <input type="checkbox"/> Auto/manual Pilot operated with spring return, no by pass		
ENGINE JACKET WATER HEATER				
* Manufacturer: Model		CS. Regulator: <input type="checkbox"/> Pressure reducing balanced w/2psig minimum differential.		
* Phase/Volts: Watts:		Reg. Capacity: 40,400 scf/hr	Pressure Rated: 275 psig Max	
Enclosure rating: <input type="checkbox"/> Standard <input type="checkbox"/> Explosion proof		(1) Electric driven fully pneumatic systems available where job site facilities have no air		
		(2) Air drying systems available where only utility air system exists.		
		(3) Sub - 0°F ambient temperature environment require minus 60°F dew point instrument		
		medium and other optional special design features.		
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FIRE PUMP ACCESSORIES		OPERATIONAL CONTROLS		
Relief Valve Mfr.: Clayton Model 50A20 trimmed for seawater service		Start Signal: Pressure loss on low firewater pressure or other remote input		
* Relief Valve Size (in/out): _____" x _____" Pressure Range: 20-200 psig		Alarm Indicators: <input type="checkbox"/> Engine overspeed <input type="checkbox"/> Low oil press. <input type="checkbox"/> High water temp.		
Relief Valve Body: <input type="checkbox"/> Carbon St. <input type="checkbox"/> Bronze <input type="checkbox"/> Ductile Iron		<input type="checkbox"/> Overcrank after 90 sec. <input type="checkbox"/> Low starting medium storage <input type="checkbox"/> Low fuel level		

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Gauge Mfr.: Wika	Model: Glycerin filled	Remote Alarms:	☑ Controls not In auto ☑ Engine running ☑ Common Trouble			
Gauge Size: 4" dia.	Pressure Range: 0-300 psig	Emergency shut-down:	☑ @ 15 to 20% overspeed ☑ Manual restart			
Waste Cone Type: ☑ Open ☑ Closed Fabricated CS, Marine epoxy ☑ Yes ☑ No		Combustion Air shut-down:	☑ @ 5 to 10% overspeed: ☑ Auto restart			
* WasteCone Size (in/out): _____" x _____"		Non emergency shut-down:	☑ After 5-minute delay with engine at "Idle" Speed			
Air Relief Type: Reversed check valve	Location: C.W. piping	Audible alarm horn:	☑ Yes / ☑ No			
AIR INTAKE			SKID			
Type:	☑ Marine, dry type single stage filter	Remote:	☑ Yes / ☑ No			
Options:	☑ Corrosion Free Marine dry type single stage filter					
Options:	☑ Inlet hood, and mounting brackets					
Gas Detection:	LEL Combustion gas detection, by gas detection system, by others					
Spark Arrester:	☑ Naturally Aspirated engines require for Div 1					
			Sea-state acceleration: Horizontal 0.7g / Vertical 1.8g			
			Seismic: Zone 4 * C of G Longitudinal " Vertical "			
			All loads are less than: AISC allowable (Specific Torsional Anal's not included)			
			Specific Torsional Analysis option: ☑ Yes / ☑ No			
			Other: Skid drain pan w/ 2" FNPT Conn. / 316SS fasteners with flat washers			
GEAR DRIVE AND COUPLING			FUEL SUPPLY SYSTEM			
Gear Mfr.:	Model:	VHS	Tank:	☑ 10-11 gauge welded CS ☑ 316SS optional for corrosion		
Type:	Marine	Thrust capacity	Lbs down	Capacity:	☑ 8 hour supply ☑ ABS capacity, 18 hour supply	
Service Factor:	1.5	Bearing Life:	☑ 20,000 hrs min	Supply Conn:	Industrial ball float type auto-fill _" connection with 8" service hatch	
Non-Rev-Ratchet:	☑ Sprague type	Heat Exchanger:	☑ 90/10 Cu/Ni coil	Pipe & fittings:	316SS Sch 40 & 150# Cl w/ braided wire shield bellows flex conn's	
Certification:	FM ☑ Yes / ☑ No	AGMA	Accessories: ☑ Vacuum break/vent ☑ dial type fuel level gage ☑ low fuel switch			
Eng. Coupling:	Dynamically balanced, double universal joint					
U-Joint Mfr:	Dana or GWB	Model:	☑ 2" Emergency fill ☑ fire safe _" fuel supply & 1" drain valves			
Bearing life:	2,500 hours min	Service Factor	1.5	Option:	☑ Sight glass type fuel & water level gauge	
Guard:	Non-sparking, fiberglass OSHA guard, red gelcoat					
			COATINGS			
			Substrate:	SSPC-SP5	Finish: 2-4 mils polyurethane "Red"	
			Prime:	2-4 mils inorganic zinc	2 nd Coat: 2-4 mils high build epoxy	
CLIENT SUPPLIED DATA (utilities and ambient conditions)						
Pressurized Air Available: Yes ☑ / No ☑			Design Conditions: Max. Temp.: _____ Min. Temp.: _____			
Power Gas: Yes ☑ / No ☑ Type: _____			RH: _____			
	Dew Point	Pressure	Flow	Water Conditions: Max. Temp.: _____ Min. Temp.: _____		
Instrument Air				SG: _____		
Utility Air						
Power Gas:						
Electrical Power: Yes ☑ / No ☑ Volts/ph/cyl.:						
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