MECHANICHAL DATA SHEET FOR FIRE WATER ELECTRICAL PUMPS

1	**GENERAL DATA (NOTE 6)**						
2	ITEM	**10-P-0801 (NOTE 4 & 10)**			NO. OF MAIN / STAND BY UNITS	**1 /**	
3	SERVICE	**FIRE WATER SUPPLY PUMPS**			*INSTALLATION:*	**UNDER SHELTER**	
4	OPERATION:	**CONTINUOUS (NOTE 1)**			PARALLEL	**PARALLEL**	
5	TYPE OF DRIVER	**ELECTRICAL MOTOR**	FOR UNITS		DATA SHEET NO.		
6	TYPE OF DRIVER		FOR UNITS		DATA SHEET NO.		
7	ELECTRICAL SUPPLY:	VOLTAGE **6000 V**			FREQUENCY **50 HZ**	PHASES NO. **3**	
8		*HEATING*	*VOLTAGE*		*FREQUENCY*	*PHASES NO.*	
9	**CHARACTERISTICS OF HANDEL LIQUID (NOTE 13)**						
10	TYPE OF HANDLED LIQUID				**FIRE WATER(NOTE 12)**		
11	PUMPING TEMPERATURE	MIN/ NORM/ MAX (NOTE 2)		°C	/	**AMB** /	
12	DENSITY AT TEMPERATURE MIN/ NORM/ MAX			kg/m^3	/	**998** /	
13	VISCOSITY AT TEMPERATURE MIN/ NORM/ MAX			mPa.s	/	**0.8804** /	
14	VAPOR PRESSURE AT NORMAL PUMPING TEMPERATURE			bar a		**0.1107**	
15	FREEZING POINT / POUR POINT			°C		**Not applicable**	
16	DISSOLVED GAS			(yes-no)		**NO**	
17	CORROSIVE/ EROSIVE/ HAZARDOUS AGENTS			(yes-no)	**NO** /	**NO** /	**NO**
18	SUSPENDED SOLIDS:	TYPE/ DIMENSIONS/ VOLUME%		mm	**NO** /	**NO** /	**NO**
19	**OPERATING CONDITIONS**						
20	SUCTION PRESSURE	MIN/ NORM/ MAX		bar a	**1.117** /	**2.404** /	**2.434**
21	DISCHARGE PRESSURE AT RATED CAPACITY			bar a	/	**9.50** /	
22	DEFERENTIAL PRESSURE AT RATED CAPACITY			bar		**8.383 (NOTE 5)**	
23	CAPACITY	MIN/ NORM/ RATED		m^3/h	/	**908.4** /	**(NOTE 9)**
24	HEAD AT RATED CAPACITY			m		**85.625**	
25	NPSH AVAILABLE			m		**10.063**	
26	MAX ALLOWABLE HEAD AT SHUT-OFF			m		**144.734 (NOTE 11)**	
27	ESTIMATED ABSORBED POWER AT PUMP SHAFT			KW		**424 (NOTE 18)**	
28	FLOW CONTROLLED BY: pressure controller- level controlled- flow controller- other						
29	REACCELERATION/ AUTOMATIC START-UP			(yes-no)	**YES** /	**YES**	
30	START-UP WITH DELIVERY VALVE:			(open- closed)	**OPEN**		
31							
32							
33							
34	**MECHANICAL DATA**						
35	SEALING TYPE				**PACKING**		
36	CONTAMINATION OF LIQUID HANDLED ALLOWED			(yes-no)			
37	AIR ENTERAINMENT ALLOWED			(yes-no)			
38	LEAKS ALLOWED			(yes-no)	**YES**		
39	ANT FREEZING PROTECTION			(yes-no)	**NO**		
40	PUMP DESIGN CODE				**NFPA 20- Latest Edition**		
41	PROJECT SPECIFICATION						
42							
43							
44							
45							

1	**MECHANICAL DATA**			
2	SUCTION LINE: DIAMETER/ RATING/ FACING ANSI		NSP	**14" / 150# / RF**
3	DISCHARGE LINE: DIAMETER/ RATING/ FACING ANSI		NSP	**12" / 150# / RF**
4	VENT/ DRAIN REQUIRED		(yes-no)	**YES / YES**
5	MATERIAL IN CONTACT WITH LIQUID HANDLED (minimum requirement)			**Cast Iron (VENDOR TO VERIFY/CONFIRM)**
6	PUMP CASING MATERIAL (minimum requirement)			**Cast Iron (VENDOR TO VERIFY/CONFIRM)**
7	PUMP IMPELLER MATERIAL (minimum requirement)			**Cast Iron (VENDOR TO VERIFY/CONFIRM)**
8	PUMP INTERNAL PARTS MATERIAL (minimum requirement)			**Cast Iron (VENDOR TO VERIFY/CONFIRM)**
9	CASING CORROSION ALLOWANCE		**mm**	
10	MINIMUM DESIGN METAL TEMP./ AT A PRESSURE OF		**°C / bar g**	
11	COOLING FLUID: TYPE/ DESIGN PRESS./ OPERATING TEMP.		bar g / **°C**	/
12	HEATING FLUID: TYPE/ DESIGN PRESS./ OPERATING TEMP.		bar g / **°C**	/
13				
14	**FLUSHING FLUID**			
15	TYPE			
16	PRESSURE	MIN/ NORM/ MAX	**bar g**	
17	TEMPERATURE	MIN/ NORM/ MAX	**°C**	
18	DENSITY AT TEMPERATURE	MIN/ NORM/ MAX	**kg/m3**	
19	VAPOR PRESSURE AT MAX TEMPERATURE		**bar**	
20	FREEZING POINT/ POUR POINT		**°C**	
21	HAZARDOUS AGENTS		(yes-no)	
22				
23				
24				
25				
26				

1	MFR			MODEL	
2	PURCHASE ORDER NO.			REV.	DATE
3	OFFER NO.			REV.	DATE
4	CODES AND STD FOR CONSTRUCTION			**NFPA 20**	
5	**PERFORMANCE**			**REQUIRED DATA**	**SUPPLIER DATA**
6	CHARACTERISTIC CURVE NO.				
7	RATED CAPACITY (line 22 sh. 3)		**m^3/h**	**908.4**	
8	CAPACITY AT BEST EFFICIENCY POINT		**m^3/h**		
9	MINIMUM CONTINUOUS CAPACITY		**m^3/h**		
10	HEAD AT RATED CAPACITY (line 23 sh. 3)		**m**	**85.625**	
11	MAXIMUM HEAD		**m**		
12	HEAD WITH MAXIMUM IMPELLER DIAMETER @ RATED CAPACITY		**m**		
13					
14					
15	PUMP SPEED		**RPM**		
16	NPSH REQUIRED AT RATED CAPACITY		**m**		
17	EFFICIENCY AT RATED CAPACITY		**%**		
18	ABSORBED POWER RATED CAPACITY		**KW**		
19	MAX ABSORBED POWER WITH IMPELLER DESIGN/ MAX DIAMETER		**KW**	/	
20	ABSORBED POWER BY OIL PUMP / HEATER		**KW**	/	
21	DIFFERENCE: (NPSH AVAILABLE -NPSH REQUIRED)		**m**		
22	MAX OPERATION TIME AT SHUT-OFF		**s**		
23	RATIO: IMPELLER DIAMETER / IMPELLER EYE AREA				
24	SPECIFIC SPEED				
25	SUCTION SPECIFIC SPEED	(SI UNITS: RPM, M^3 ***/ s,m)***			
26	CAPTIVITY RATIO: RATED / AT B. E. P.		**%**		
27	HEAD RATIO: MAX / AT RATED CAPACITY		**%**		
28	IMPELLER RATIO: DESIGN IMPELLER DIAMETER / MAX IMPELLER DIAMETER		**%**		
29	**CONSTRUCTION FEATURES**				
30	MAX ALLOWABLE TEMPERATURE		**°C**		
31	MAX ALLOWABLE PRESSURE AT MAX ALLOWABLE TEMPERATURE		**barg**		
32	HYDROSTATIC TEST PRESSURE		**barg**	**1.5x MAWP**	
33	ALLOWABLE LOADS ON FLANGES AS PER API 610		**(yes-no)**	**2 X API 610**	
34	LATERAL CRITICAL SPEED		**RPM**		
35	MOMENT OF INERTIA		**kg/m3**		
36	AXIAL THRUST ON SHAFT (+ = to driver; - = opposite to driver)		**N**		
37	MAX TORQUE AT 100% OF PUMP SPEED		**N.m**		
38	MASSES:	PUMP/ 1GEARBOX/ BASE PLATE	**kg**		
39		DRIVER/ TOTAL	**kg**		
40	OUTLINE DIMENSIONS OF UNIT:	LENGTH / WIDTH/ HEIGHT	**m**		
41	NOISE LEVEL OF COMPLETE UNIT:	SPLAT 1m/ PWL **(NOTE 7)**	**dB(A)**	**≤85**	
42					
43					
44					

	CONSTRUCTION FEATURES				REQUIRED DATA	SUPPLIER DATA
2	CASING:	MOUNTING:	centerline- foot- near centerline		**FOOT**	
3		SPLIT:	axial- radial- barrel		**AXIAL**	
4		TYPE:	single volute- double volute- diffuser			
5		THICKNESS/ CORROSION/ ALLOWANCE		**mm**	**/ -**	
6	IMPELLERS:	NUMBER			**1**	
7		TYPE:	open - closed		**CLOSED**	
8		DIAMETER:	MIN/ DESIGN/ MAX		**/ /**	
9		MOUNTING:	overhung- between bearings		**BETWEEN BEARING**	
10		CONFIGURATION:	one way- opposed			
11		1st STAGE SUCTION:	single- double			
12	ROTATION VIEWED FROM COUPLING END			**(CW-CCW)**		
13	CASING WEAR RINGS:		SUCTION/ REAR	**(yes-no)**	**YES / YES**	
14	IMPELLER WEAR RINGS:		SUCTION/ REAR	**(yes-no)**	**YES / YES**	
15	RADIAL / THRUST BEARING TYPE				**BALL / BALL**	
16	LUBRICATION TYPE:		grease - oil ring- forced		**OIL RING**	
17	SUCTION NOZZLE:		SIZE / RATING/ FACING	**NPS**	**14"/ 150# / *RF***	
18			FINISHING/ LOCATION		**125AARH / SIDE**	
19	DISCHARGE NOZZLE:		SIZE / RATING/ FACING	**NPS**	**12" / 150# / *RF***	
20			FINISHING/ LOCATION		**125AARH / SIDE**	
21	SEAL:	TYPE			**PACKING**	
22		MANUFACTURER/ MODEL			**/**	
23		API CODE				
24		API FLUSHING PLAN				
25		STUFFING BOX PRESSURE		**bar**		
26		SHAFT DIAMETER AT SEAL		**mm**		
27	EXTERNAL FLUSHING CONSUMPTION			**m^3/h**		
28	PUMP COOLING API PLAN / CONSUMPTION			**m^3/h**	**/**	
29	HEATING FLUID CONSUMPTION			**kg/h**		
30	COUPLING MANUFACTURER / MODEL				**/ FLEX METAL**	
31	GEARBOX:	TYPE/ MANUFACTURER			**/**	
32		AGMA SERVICE FACTOR				
33		INTEL / OUTLET ROTATIONAL SPEED		**RPM**	**/**	
34		DATA SHEET N0.				
35	**MATERIALS**					
36	API 610 CODE					
37	CASING/ BARREL				**Cast iron (VENDOR TO VERIFY/CONFIRM)**	**/**
38	IMPELLER				**Cast iron (VENDOR TO VERIFY/CONFIRM)**	
39	SHAFT SLEEVE					
40	SHAFT					
41	CASING/ IMPELLER WEAR RING					**/**
42	INTERNAL PARTS					
43	FLUSHING/ COOLING/ OIL PIPING				**/ /**	**/ /**
44	BASE PLATE				**STEEL**	

EXTERNAL OF SUPPLY ([X] INCLUSIONS)

[X] DRIVERS	[ ] GEARBOXES		[X] COMMON BASE PLATES FOR PUMP/ DRIVER/CONTROLLER	
[X] COUPLINGS	[X] COUPLING GUARDS	[X] NOT- SPARKING	[X] FOUNDATION BOLTS	[X] BOLTS FOR DRIVERS AND GEARBOXES
[X] UNIT ASSEMBLY AT FACTORY			[X] CASING DRAINS	[X] WITH VALVES **FLANGED**
[ ] MECHANICAL SEALS			[X] CASING VENTS	[X] WITH VALVES **(IF ANY)**
[ ] MECHANICAL SEALS ACCESSORIES			[X] SHOP TESTS	
[ ] COOLING AND FLUSHING PIPING			[X] SPARE PARTS FOR START-UP	
[ ] LUBRICATION SYSTEM			[X] SPARE PARTS FOR 2 YEARS OF OPERATION	
[ ] SHOP FABRICATION OF PIPING FROM OIL CONSOLE TO PUMP			[X] SPECIAL TOOLS AND WRENCHES	
[X] AUTOMATIC AIR RELEASE			[X] INSTRUCTION MANUALS NO. COPIES (IN ENGLISH) **(NOTE 14)**	
[X] INSTRUMENTS AS PER PID #10-08-A1-SA-0804-N			[X] PAINTING	
[X] PUMP SUCTION LINE STRAINER AS PER PID #10-08-A1-SA-0804-N			[X] DOCUMENTATION	
			[X] LOCAL CONTROL PANEL	

INSPECTION AND TESTING **[X] INCLUSIONS)**

- [X] HYDROSTATIC TEST
- [X] PERFORMANCE TEST (WITNESS)
- [X] NPSH TEST (IF REQUIRED)
- [X] MECHANICAL RUNNING TEST (4 HR)(WITNESS)
- [X] DISMANTELLING AFTER MECHANICAL RUNNING TEST **(NOTE 16)**
- [X] SITE PERFORMANCE TEST

NOTES

1) Fire pumps are in continuous operation in case of fire only

2) Pumps Design temperature 65º C.

3) Deleted

4) Pumps shall comply with NFPA 20 requirements (latest revision)

5) The worst case is considered for differential pressure

6) This document is based on process data sheet Nº 10-08-DSH-SA-0801-N.

7) Including driver.

8) Pumps, drivers, materials are requested to be listed for fire pump service by U.L.and approved by F.M.

9) The pump shall be performance tested at rated speed. The pump shall furnish not less than 150% of rated capacity at a pressure not less than 65% of rated head

10) Hazardous Area Classification: Non- hazardous.

11) Shut off pressure shall not exceed 140% of rated head. PSV, if any , corresponding flow detector will be provided by pump vendor

12) For fire water quality refer to Utilities Specification Nº 10-00-DSH-PR-0002-L

13) A certified test curve indicating the flow, head, power and efficiency will be provided after finalizing with pump supplier

14) As per related material requisition

15) All the instrumentation & signal interfaces in the relevant package battery limit shall be considered.

16) COMPANY / PURCHASER inspectors shall have the right to order dismantelling the pumps, after mechanical running test, if test resultrs are not in accordance with NFPA 20 and related project specification.

17) Start ,Stop & Select shall be provided on the local control panel.

18) Shall be finalized by vendor, with considering 50% efficiency, at least

19) Suction strainer and discharge PSV according to PID should be supplied by pump vendor

DESIGN DATA

Rated Power:		kW	–								
Rated Voltage (Un):	6000	V	–	Combined fluctuation V & Hz:	*+/- 10% & +/- 2%*		Frequency:	50Hz			
System neutral point:			–	N. of poles:		–	Shape:				
Duty: continuous ■	–	intermittent ☐	–	Duty cycle period:		s	–	Cyclic duration factor:		%	
Cooling:											
Execution and degree of protection	Frame:	IP55									
	Terminal box:	IP66									
Lubrication:											
Star - up: direct ■	–	Y/D ☐	–	auto- transformer ☐	–					☐	
Main. Voltage at terminals:				***80***	% Vn	–	I.s.c. max at terminals	100	kA	1 s	
DATA OF DRIVEN MACHINE	Type					–	■ Coupling:	direct ■	–	gear ☐	– belt ☐
	I = mr^2:	kgm	–	Base plate:	common ■	–	not common ☐	–			☐
	Stalling torque (Tr):										
	Thrust to:		–		kg	–					

PERFORMANCE AND CONSTRUCTION ATA

MFR. And construction type:											
Rated current:					A	–	start- up current:	A	p.u.	± **5**	%
Rated torque (Tu):					N m	–	Locked rotor torque (Tl):	**Nm**			p.u.
Minimum torque (Tu):		aprox.		N m	p.u.	–	Maximum torque (Tb):	**Nm**			p.u.
Load					locked rotor	–	Full load speed:				RPM
Efficiency p.u.						–	Specific Start- up time(t_{AS}):				s
Power factor						–	Locked rotor time: t_{RB}				s
Successive start- ups N.:		cold/warm	–	Insulation class:	F	–	Temperature rise:	B			
Overall noises level:		dBA -									
Lubricant:						–	Lubricating interval:				
Type of bearings D.E.:						–	N.D.E.:				
Direction of rotation with phases time sequence and connection: L1- U, L2- V, L3- W(1):											
Terminal box	Quality/ entry diameter N		/			mm	–	Position			
	Entry type:	cable gland ■	–	cone ☐	–	threaded ☐	thread type:				
Enclosure dimensions:						–	I = mr^2	kgm^2	–		
Mass: Total		kg	–	Rotor	kg	–					
paint: Color:											

ACCESSORY AND ANCILLARY EQUIPMENT

Anti - condensation heater ■	N. of phases:	–	V	–	W	–	
Resistance temperature detectors (RTD):	☐	Quantity N.:	–	Type:			
Bearing thermometer: ☐	electrical contact ☐						