

DIESEL ENGINE

MODEL 4DSP-80

Performances

Ratings		3000 rpm	
		PRIME	STAND-BY
Rated Output	kWm	72	80

Note:

PRIME POWER: The prime power is the maximum power available with varying loads for an unlimited number of hours. The average power output during a 24h period of operation must not exceed 80% of the declared prime power between the prescribed maintenance intervals and at standard environmental conditions. A 10% overload is permissible for 1 hour every 12 hours of operation.

STAND-BY POWER: The stand-by power is the maximum power available for a period of 500 hours/year with a mean load factor of 90% of the declared stand-by power. No kind of overloads is permissible for this use.

Specifications

Mechanical system

Engine model	4DSP-80
Engine type	In-line, 4 stroke, water cooled
Combustion type	Direct Injection
Cylinder type	Dry liner
Air intake type	Turbocharger
Cylinder No.	4
Bore*Stroke(mm)	102*118
Total displacement(L)	3.856
Compression ratio	17.5:1
Firing order	1-3-4-2
Injection timing	15°±1°
Speed governor	Mechanical ≤8%
Exhaust temperature (°C)	≤550
Mean Effective Pressure (KPa)	747
Noise Level(dBA)	≤93
Exhaust gas back pressure(KPa)	7.5
Exhaust flow (m ³ /h)	1320
Cooling air flow (m ³ /h)	720
Air for combustion flow (m ³ /h)	547
Piston Speed(m/s)	11.8
Dry weight (kg)	342
Dimension(L*W*H)(mm)	985*545*961 (with radiator)
Rotation	Counter clockwise viewed from flywheel
Flywheel housing/flywheel	SAE3/ 11.5"

Mechanism

Type	Over head valve
Valves per cylinder	2
Valve lash(cold state)	Air intake valve 0.30-0.40mm Exhaust valve 0.30-0.40mm

Valve timing (crankshaft rotating angel)

Air intake valve open	24.5° before top dead center
Air intake valve close	55.5° after bottom dead center
Exhaust valve open	54° before bottom dead center
Exhaust valve close	26° after top dead center

Specific fuel consumption

rpm	3000
Fuel consumption (g/kWh)	≤218

Oil consumption

Oil consumption(g/kWh)	≤1.63
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Fuel system

Fuel injector pump	BQ pump
Governor model	RSV full range type
Feed pump	Mechanical type
Injection nozzle	multi holes type
Fuel filter	Spin-on type
Fuel	Diesel

Lubrication system

Type	Mixed type, pressure and splash lubrication
Oil pump Displacement/speed (L/min/r/min)	Inner and outer rotor type 50/2000
Oil filter	Spin-on type
Lube oil total system capacity	9L including pipes, filters etc.

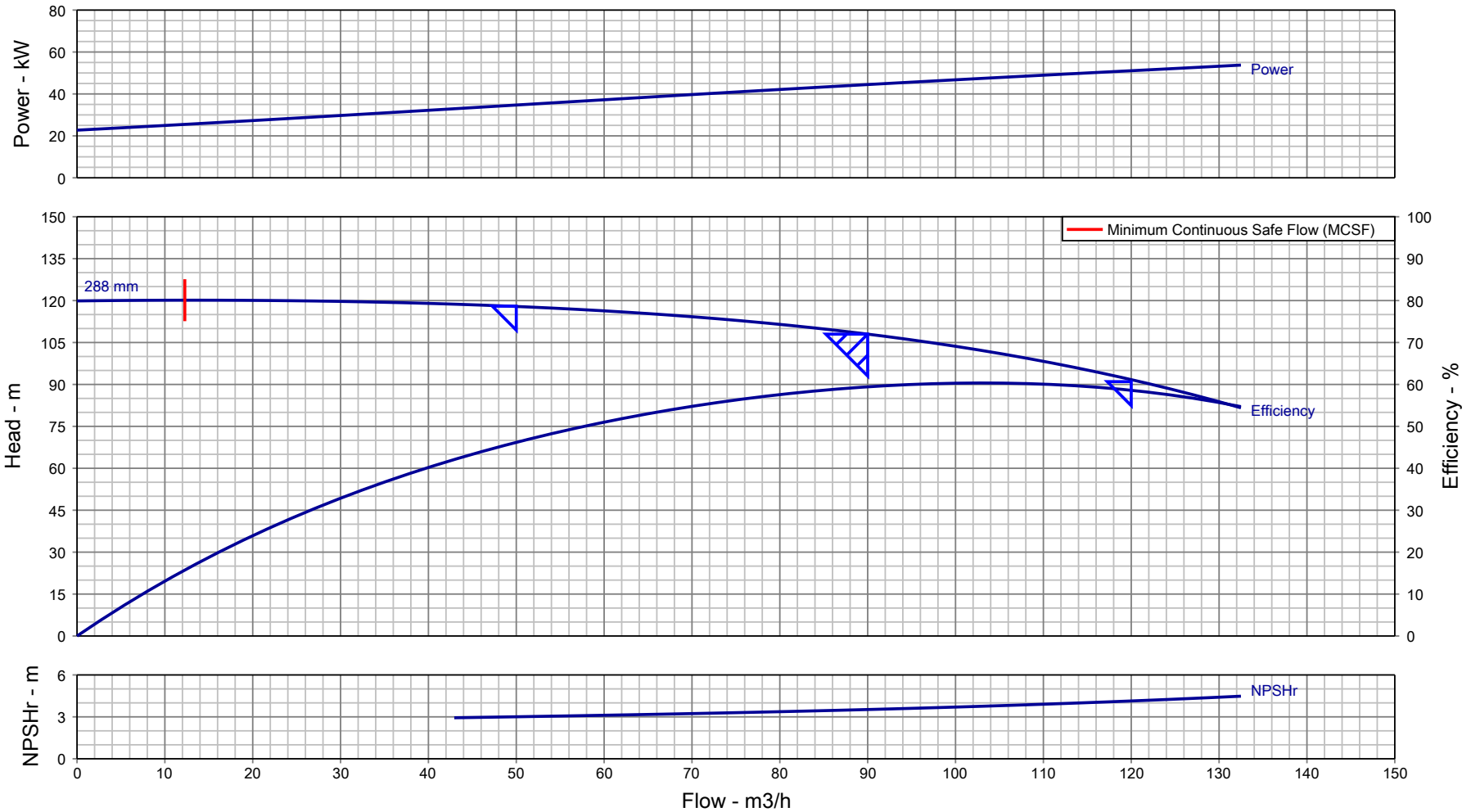
Cooling system

Cooling method	Water cooled, forced circulation
Coolant capacity: engine only	6L
Engine + radiator	14L
Water pump type	Centrifugal type driven by belt
Water pump capacity(L/min)	≥150
Thermostat	Opening temp.73°C
Cooling fan	Φ450mm, 7blades, PA

Electronic system

Charging alternator	14v/500w
AVR	Built-in type
Starting motor	12v/3.7kW
Battery capacity	12v/100Ah

Pump Performance Curve



Customer :	Pump Size/ Stages : CPHM 65/32_2900RPM/ 1	Flow, rated : 90.00 m ³ /h
Customer enquiry :	Speed, rated : 2965 rpm	Differential Head : 108.0 m
Project : Default	Based on curve number : HD13740KA0 Rev 0	Fluid density rated : 0.998 kg/dm ³
Quote number : 312657	Viscosity : 1.00 cSt	Efficiency : 59.43 %
Item number : 001	Cq/Ch/Ce/Cn [HI2010] : 1.00 / 1.00 / 1.00 / 1.00	Power, rated : 44.48 kW
Quantity : 1	Minimum recommended driver rating : 55.00 kW / 73.76 hp	NPSH required : 3.52 m
Date last saved : 09 Oct 2020 8:58 AM	Performance testing standard : ISO 9906 / ANSI-HI 14.6 Gr 2B	Liquid Type/ Application : Water

Notes: 1. Performance at shut off condition is approximate. 2. Rated impeller diameter is approximate. 3. Only duty point is guaranteed as per testing standard.

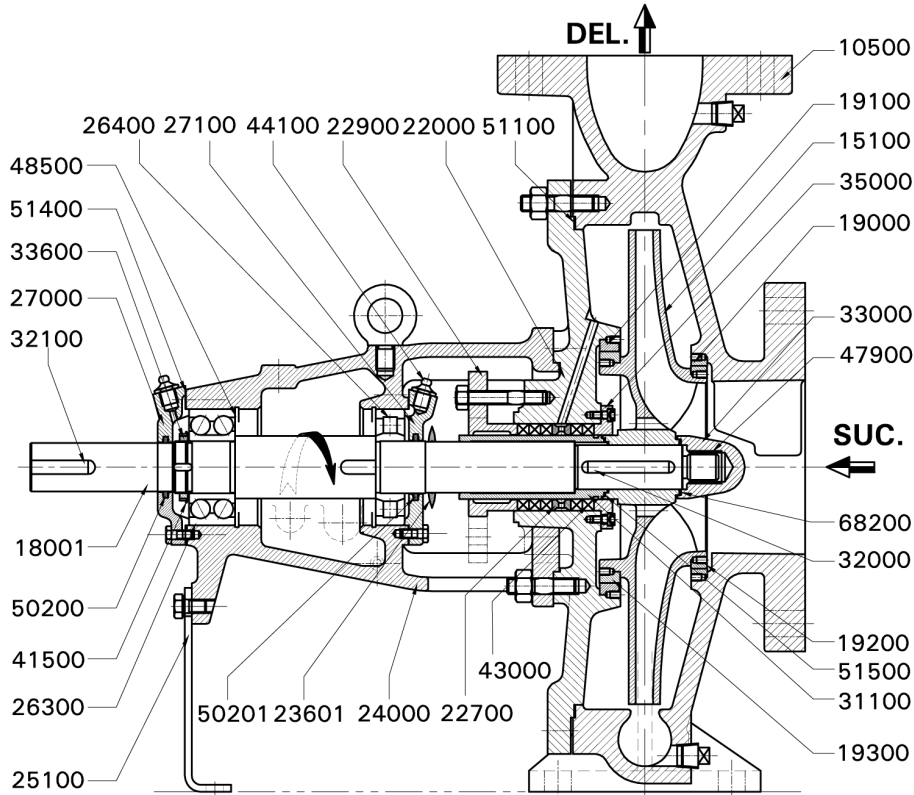


Enriching Lives

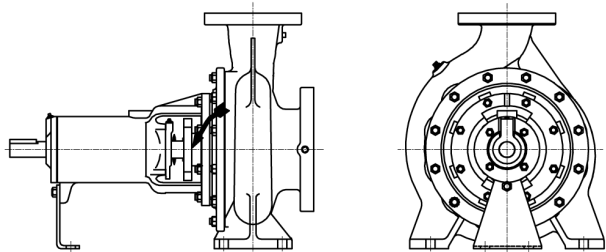
Pump Performance Datasheet			
General			
Customer	:	Quote number	: 312657
Customer Enquiry No.	:	Pump model	: CPHM 65/32_2900RPM
Project	: Default	Stages	: 1
End user	: -	Based on curve number	: HD13740KA0 Rev 0
Tag number	: 001	Date last updated	: 09 Oct 2020 8:58 AM
Service	: -	Quantity of pumps	: 1
Operating Conditions		Liquid	
Flow, rated	: 90.00 m3/h	Liquid handled	: Water
Suction pressure, rated / max	: 0.00 bar.g / 0.00 bar.g	Additional liquid description	: Fresh Water
Discharge pressure, rated	: 10.57 bar.g	Temperature, max	: 20.00 deg C
Head, rated (requested)	: 108.0 m	Solids diameter, max	: 0.00 mm
NPSH available, rated	: Value not specified	Solids in suspension by volume	: 0.00 %
Frequency	: 50 Hz	Specific gravity, rated / max	: 0.998 / 0.998 kg/dm3
Performance		Viscosity, Rated / Max.	: 1.00 cSt / -
Pump speed, rated	: 2965 rpm	Driver & Power Data	
Impeller Dia, Rated (Approx.)	: 288 mm	Driver sizing specification	: Maximum Power
Impeller diameter, maximum	: 329 mm	Margin over specification	: 0.00 %
Impeller diameter, minimum	: 255 mm	Power, rated	: 44.48 kW
Efficiency at duty point	: 59.43 %	-	: -
NPSH required / margin required	: 3.52 m / 0.50 m	-	: -
MCSF	: 12.27 m3/h	Driver Rating	: 55KW
Cq/Ch/Ce: [-]	: 1.00 / 1.00 / 1.00	Pressure Data	
Water eq. duties (Qw/Hw/Ew)	: 90.00 m3/h / 108.0 m / 59.43 %	Maximum working pressure	: 11.76 bar.g
Suction / Delivery nozzle size	: 100 mm / 65.00 mm	Maximum allowable working pressure	: 16.00 bar.g
Noise level	: 85 dB	Maximum allowable suction pressure	: 2.00 bar.g
Vibration level (RMS)	: 5.1 mm/s	Hydrostatic test pressure	: 20.59 bar.g
Test standard	: ISO 9906 / ANSI-HI 14.6 Gr 2B	Construction	
Starting condition	: Closed Delivery Valve	Basic construction	: End Suction Pump-OH1
		Impeller type	: Enclosed
		Selection status	: Near Miss
		Rec. Pipe Size (Suc / Del)	: 150 mm / 125 mm
Material			
MOC Code	: 01MOC		
Material (Casing / Impeller / Shaft)	: CI IS210:FG260 (012) / CI IS210:FG260 (012) / CS IS1570:40C8 HOT RLD (053)		
-	: -		



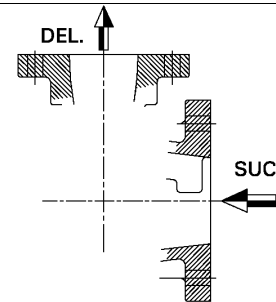
Enriching Lives



PART NO.	PART DESCRIPTION	MAT. CODE	MOC DESCRIPTION
10500	PUMP CASING	012	CI IS210:FG260
15100*	ENCLOSED IMPELLER	012	CI IS210:FG260
18001*	PUMP SHAFT	053	CS IS1570:40C8 HOT RLD
19000*	CSG. WEAR RING - SUC. SIDE	012	CI IS210:FG260
19100*	CSG. WEAR RING - DEL. SIDE	012	CI IS210:FG260
19200*	IMP. WEAR RING - SUC. SIDE	012	CI IS210:FG260
19300*	IMP. WEAR RING - DEL. SIDE	012	CI IS210:FG260
22000	CASING COVER	012	CI IS210:FG260
22700*	LANTERN RING	364	NYLON
22900	SPLIT GLAND	012	CI IS210:FG260
23601	LIQUID DEFLECTOR	370	NATURAL RUB ASTM2000AA-70SHORE/7MPa
24000	BEARING HOUSING	012	CI IS 210-FG 260
25100	SUPPORT FOOT	042	MS IS:5986-Fe410WA (OLD-IS:1079)
26300*	ANGULAR CONTACT BEARING	000	STEEL
26400*	CYLINDRICAL ROLLER BEARING	000	STEEL
27000	BEARING COVER DE	012	CI IS 210-FG 260
27100	BEARING COVER NDE	012	CI IS 210-FG 260
31100*	SHAFT SLEEVE	556	ST ST ASTM A276-410(300BHN)-ANLD
32000*	KEY FOR IMPELLER	053	CS IS1570:40C8 HOT RLD
32100	KEY FOR COUPLING	053	CS IS1570:40C8 HOT RLD
33000	IMPELLER NUT	253	ST ST ASTM A276-410 ANLD
33600*	BEARING LOCK NUT	052	CS IS1570:20C8 HOT RLD
35000*	STUFFING BOX BUSH	012	CI IS 210-FG 260
41500*	LOCK WASHER -BRG.LOCK NUT	050	CS IS1570:10C4 HOT RLD
43000*	GLAND PACKING	810	PTFE BRAIDED WITH GRAPHITE (PTFE-NONAS)
44100	GREASE NIPPLE	444	CS IS:1367 Part3 CL4.6 CDP
47900*	HELICOIL SCREW LOCK INSERT	250	ST ST ASTM A276-304 ANLD
48500*	INTERNAL CIRCLIP	054	SPRING ST IS:4072-80C6
50200*	FELT RING -DE SIDE	375	FELT
50201*	FELT RING -NDE SIDE	375	FELT
51100*	GASKET : CASING COVER	702	NON ASBESTOS FERROLITE NAM37 OR EQ
51400*	GASKET : BEARING COVER	702	NON ASBESTOS FERROLITE NAM37 OR EQ
51500*	GASKET : SH. SLEEVE & IMP.	702	NON ASBESTOS FERROLITE NAM37 OR EQ
68200*	GASKET : IMP. & IMP. NUT	702	NON ASBESTOS FERROLITE NAM37 OR EQ



STUFFING BOX SEALING: SELF INTERNAL

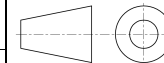


PUMP FLANGES (FF)

- NOTES:**
- * * * INDICATES RECOMMENDED SPARES.
 - FASTENERS IN LIQUID CONTACT ARE IN CS

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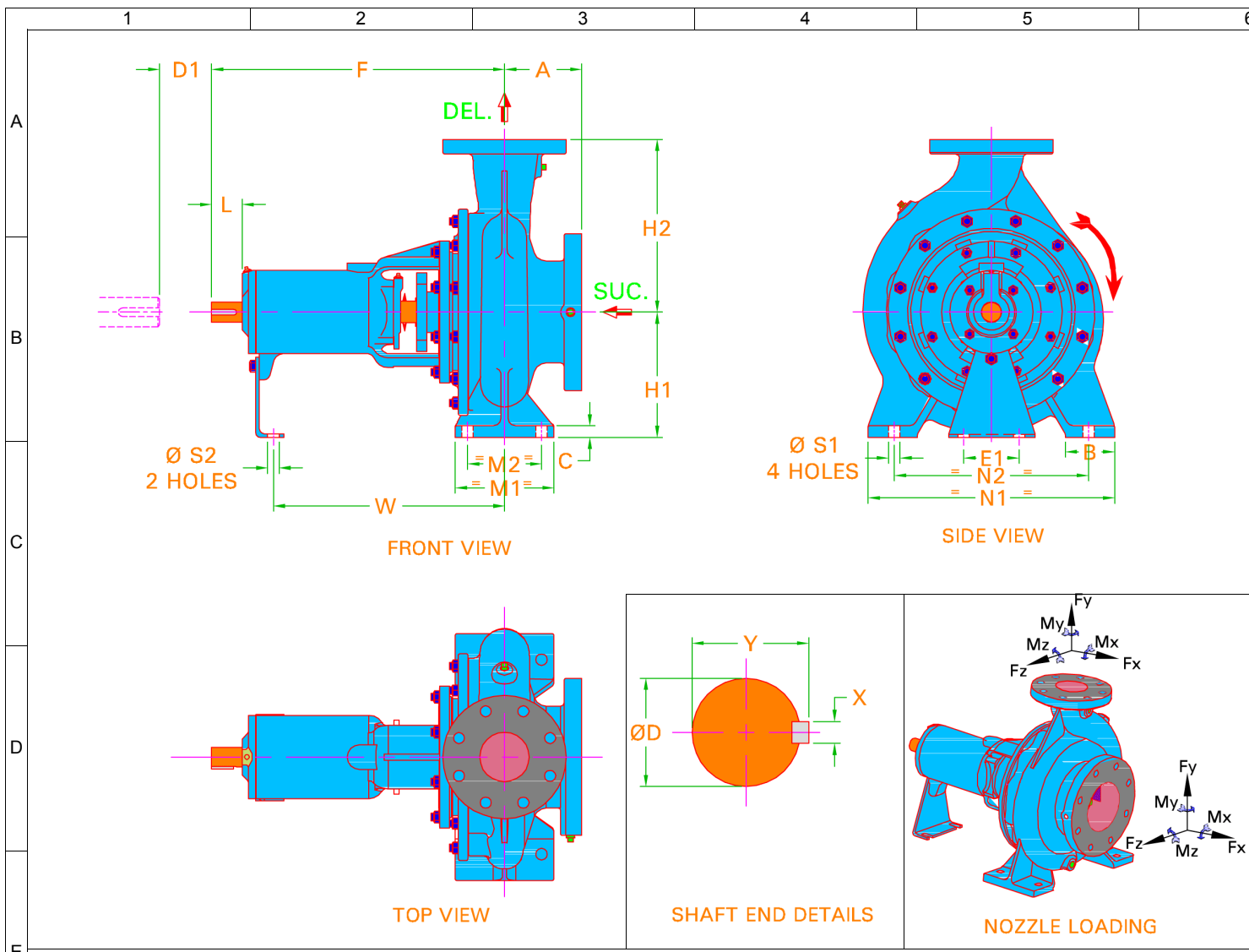
PUMP	CPHM 65/32_2900RPM	MOC	01
ENQUIRY NO./DATE	/	QUANTITY	1
PO. NO./DATE	-	TAG NO.	001
QUOTATION NO.	0	DATE.	-
O/A. NO.	-	MISI.	-
CUSTOMER	-		
END USER	-		
PROJECT	Default		
CONSULTANT	-		
SERVICE	-		



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CROSS SECTIONAL DRAWING

DRAWING NO. **TC78-1**



PUMP DUTIES			
CAPACITY	90.00 m3/h	EFFICIENCY	59.43 %
TOTAL HEAD	108.0 m	PUMP INPUT	44.48 kW
DENSITY	0.998 kg/dm3	NPSHR	3.52 m

FLANGE DRILLING STANDARD AND DETAILS					
SUCTION	BS EN1092 PN16 FF		DELIVERY	BS EN1092 PN16	
	NOM. SIZE	RF DIA.	P.C.D.	NO OF HOLES	HOLE DIA.
SUCTION	100 mm	N.A.	180 mm	8	18.0
DELIVERY	65.00 mm	N.A.	145 mm	4	18.0

ALLOWABLE NOZZLE LOADING						
	FORCES			MOMENTS		
	Fx	Fy	Fz	Mx	My	Mz
SUCTION	170.0 kgf	210.0 kgf	135.0 kgf	883 N.m	490 N.m	392 N.m
DELIVERY	170.0 kgf	210.0 kgf	135.0 kgf	883 N.m	490 N.m	392 N.m

TAPPING DETAILS	
DESCRIPTION	SIZE / TYPE
Suction Gauge	1/2"BSP
Delivery Gauge	1/2"BSP
Casing Drain	1/2"BSP
Casing Vent	NA
Bearing Cooling in / out	NA
Pad Cooling in / out	NA
Priming in	NA
Base Drain	1 BSP



DIRECTION OF ROTATION FROM DE: CLOCKWISE

PUMP	CPHM 65/32_2900R	PUMP WT.	114.0
REC. DRIVER RATING	55KW	RATED SPEED	2965RPM
ENQ. NO./DATE	/	QUANTITY	1
PO. NO./DATE	-	TAG NO.	001
QUOTATION NO.	0	DATE	-
O/A NO.	-	MISI	-
CUSTOMER	-		
END USER	-		
PROJECT	Default		
CONSULTANT	-		
SERVICE	-		



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PUMP OUTLINE DRAWING

NOTES:

- ALL DIMENSIONS ARE IN mm
- DIM 'D1' INDICATES THE DISTANCE REQUIRED TO REMOVE BACK PULL OUT ASSEMBLY.

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A	F	H1	H2	B	C	M1	M2	N1	N2	S1	E1	S2	W	-	D
125	530	225	280	80.00	16.00	160	120	400	315	18.00	110	15.00	370	-	42.00
X	Y	L	D1	-	-	-	-	-	-	-	-	-	-	-	-
12.00	45.00	110	140	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DRAWING NO. TL78-1-