DIESEL ENGINE MODEL 4DSP-38

Performances

Ratings		3000 rpm	
		PRIME	STAND-BY
Rated Output	kWm	38	41

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.

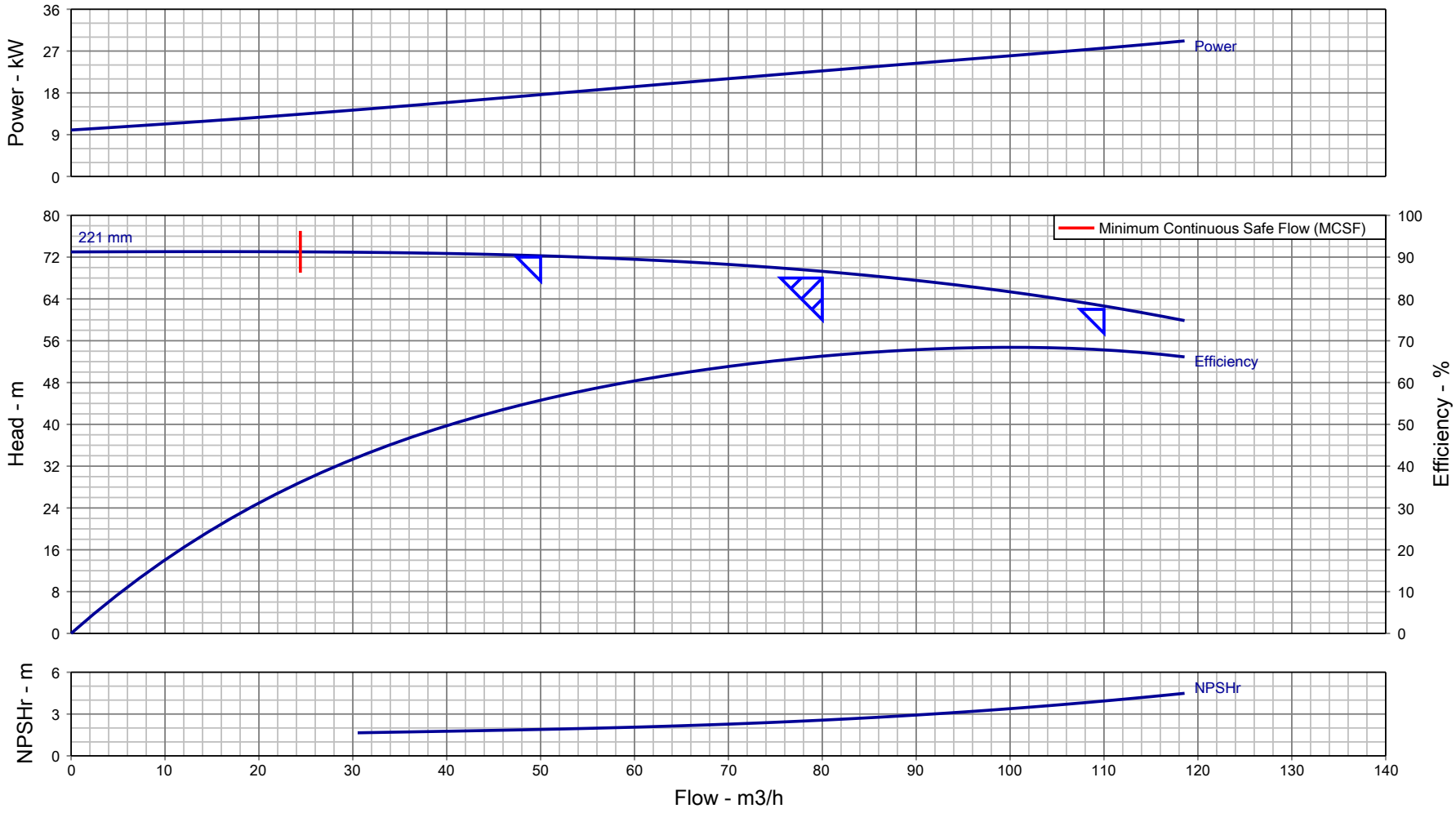
Specifications

Mechanical system

Engine model	4DSP-38
Engine type	In-line, 4 stroke, water cooled
Combustion type	Direct Injection
Cylinder type	Wet liner
Air intake type	Normally Aspirated
Cylinder No.	4
Bore*Stroke(mm)	90*100
Total displacement(L)	2.545
Compression ratio	18:1
Firing order	1-3-4-2
Injection timing	15°±1°
Speed governor	Mechanical ≤8%
Exhaust temperature (℃)	≤600
Mean Effective Pressure (KPa)	539
Noise Level(dBA)	≤93
Exhaust gas back pressure(KPa)	3.5
Exhaust flow (m^3/h)	550
Cooling air flow (m^3/h)	320
Air for combustion flow (m^3/h)	250
Piston Speed(m/s)	9.5
Dry weight (kg)	265
Dimension(L*W*H)(mm)	735*455*1100 (with muffler)
Rotation	Counter clockwise viewed from flywheel
Flywheel housing/flywheel	SAE4/ 7.5″

Mechanism	
Type	Over head valve
Valves per cylinder	2
Valve lash(cold state)	Air intake valve 0.20-0.30mm Exhaust valve 0.25-0.35mm
Valve timing (crankshaft rotating angel)	
Air intake valve open	14.5° before top dead center
Air intake valve close	37.5° after bottom dead center
Exhaust valve open	56° before bottom dead center
Exhaust valve close	12° after top dead center
Specific fuel consumption	
rpm	3000
Fuel consumption (g/kWh)	≤240
Oil consumption	
Oil consumption(g/kWh)	≤0.72
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	Inner and outer rotor type
(L/min/r/min)	21/1500
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	5.5L
Engine + radiator	12L
Water pump type	Centrifugal type driven by belt
Water pump capacity(L/min)	≥80
Thermostat	Opening temp.73℃
Cooling fan	Φ400mm, 7blades, PA
Belt	Twin for safety
Electronic system	
Charging alternator	14v/350w
AVR	Built-in type
Starting motor	12v/3.8kW
Battery capacity	12v/100Ah

Pump Performance Curve



Customer	:	Pump Size/ Stages	: DB 65/26/ 1	Flow, rated	: 80.00 m3/h
Customer enquiry	:	Speed, rated	: 2950 rpm	Differential Head	: 68.00 m
Project	: Default	Based on curve number	: HD10216A0 Rev 0	Fluid density rated	: 0.998 kg/dm3
Quote number	: 312657	Viscosity	: 1.00 cSt	Efficiency	: 66.31 %
Item number	: 001	Cq/Ch/Ce/Cn [HI2010]	: 1.00 / 1.00 / 1.00 / 1.00	Power, rated	: 22.73 kW
Quantity	: 1	Minimum recommended driver rating	: 30.00 kW / 40.23 hp	NPSH required	: 2.56 m
Date last saved	: 08 Oct 2020 12:12 PM	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.

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Pump Performance Datasheet

General

Customer	:	Quote number	: 312657
Customer Enquiry No.	:	Pump model	: DB 65/26
Project	: Default	Stages	: 1
End user	: -	Based on curve number	: HD10216A0 Rev 0
Tag number	: 001	Date last updated	: 08 Oct 2020 12:12 PM
Service	: -	Quantity of pumps	: 1

Operating Conditions

Flow, rated	: 80.00 m3/h
Suction pressure, rated / max	: 0.00 bar.g / 0.00 bar.g
Discharge pressure, rated	: 6.78 bar.g
Head, rated (requested)	: 68.00 m
NPSH available, rated	: Value not specified
Frequency	: 50 Hz

Performance

Pump speed, rated	: 2950 rpm
Impeller Dia, Rated (Approx.)	: 221 mm
Impeller diameter, maximum	: 264 mm
Impeller diameter, minimum	: 205 mm
Efficiency at duty point	: 66.31 %
NPSH required / margin required	: 2.56 m / 0.50 m
MCSF	: 24.41 m3/h
Cq/Ch/Ce: [-]	: 1.00 / 1.00 / 1.00
Water eq. duties (Qw/Hw/Ew)	: 80.00 m3/h / 68.00 m / 66.31 %
Suction / Delivery nozzle size	: 80.00 mm / 65.00 mm
Noise level	: 90 dB
Vibration level (RMS)	: 5.1 mm/s
Test standard	: ISO 9906 / ANSI-HI 14.6 Gr 2B
Starting condition	: Closed Delivery Valve

Material

MOC Code	: 16MOC
Material (Casing / Impeller / Shaft)	: CI IS210:FG260 (012) / CI IS210:FG260 (012) / ST ST ASTM A276-410 ANLD (253)
-	: -

Liquid

Liquid handled	: Water
Additional liquid description	: Fresh Water
Temperature, max	: 20.00 deg C
Solids diameter, max	: 0.00 mm
Solids in suspension by volume	: 0.00 %
Specific gravity, rated / max	: 0.998 / 0.998 kg/dm3
Viscosity, Rated / Max.	: 1.00 cSt / -

Driver & Power Data

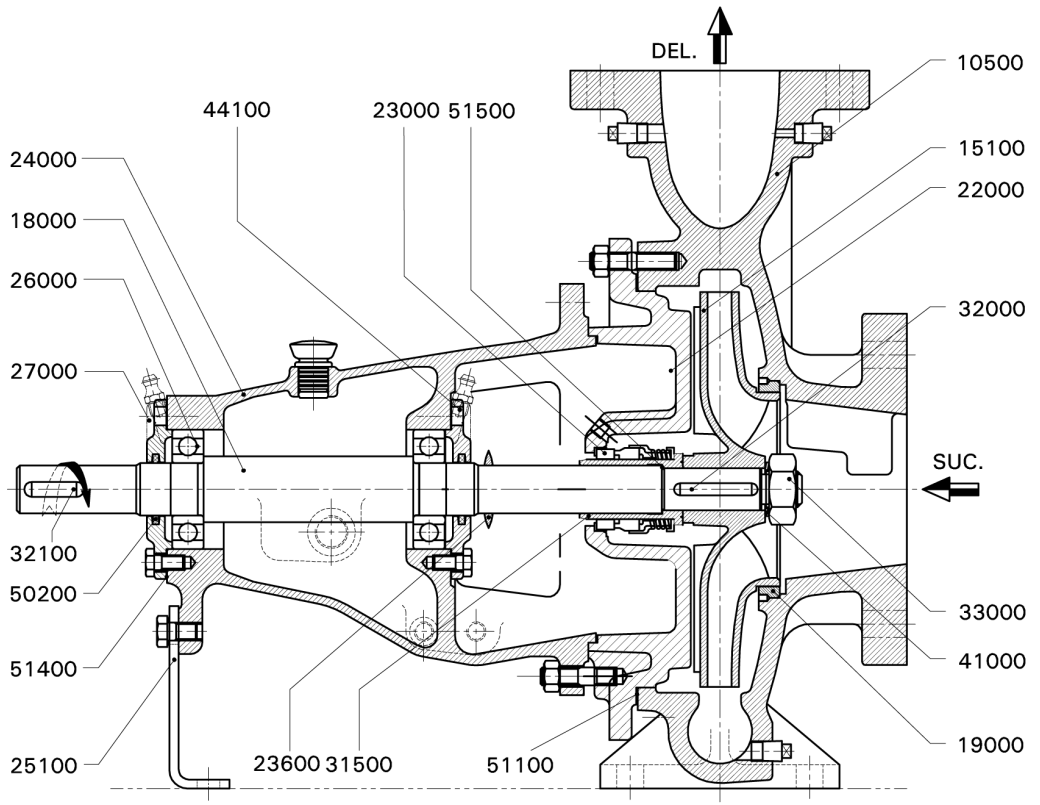
Driver sizing specification	: Maximum Power
Margin over specification	: 0.00 %
Power, rated	: 22.73 kW
-	: -
-	: -
Driver Rating	: 30KW

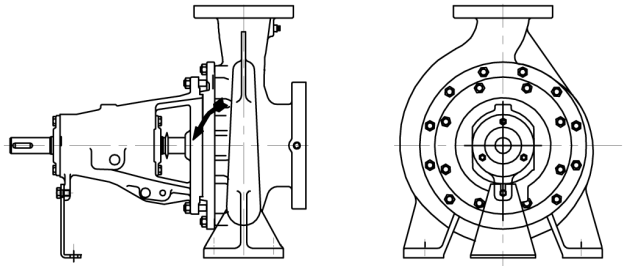
Pressure Data

Maximum working pressure	: 7.15 bar.g
Maximum allowable working pressure	: 16.00 bar.g
Maximum allowable suction pressure	: 1.96 bar.g
Hydrostatic test pressure	: 18.34 bar.g

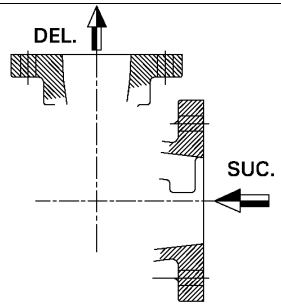
Construction

Basic construction	: End Suction Pump-OH1
Impeller type	: Enclosed
Selection status	: Acceptable
Rec. Pipe Size (Suc / Del)	: 125 mm / 125 mm





STUFFING BOX SEALING: AS PER API PLAN 01



PUMP FLANGES (FF)

NOTES:

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

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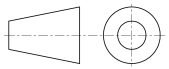
PART NO.	PART DESCRIPTION	MAT. CODE	MOC DESCRIPTION
10500	PUMP CASING	012	CI IS210:FG260
15100*	IMPELLER	012	CI IS210:FG260
18000*	PUMP SHAFT	253	ST ST ASTM A276-410 ANLD
19000*	WEAR RING - SUCTION SIDE	012	CI IS210:FG260
22000	CASING COVER	012	CI IS210:FG260
23000*	MECHANICAL SEAL	998	DIN SEAL
23600*	LIQUID DEFELCTOR	370	NATURAL RUB ASTMD2000AA-70SHORE/7MPa
24000	BEARING HOUSING	012	CI IS210:FG260
25100	SUPPORT FOOT	042	MS IS:5986-Fe410WA (OLD-IS:1079)
26000*	DEEP GROOVE BALL BEARING	000	STEEL
27000	BEARING COVER DE & NDE	012	CI IS 210-FG 260
31500*	SHAFT SLEEVE - MECHANICALSEAL	565	ST ST ASTMA276-410(210/250BHN)-ANLD
32000*	KEY FOR IMPELLER	253	ST ST ASTM A276-410 ANLD
32100	KEY FOR COUPLING	053	CS IS1570:40C8 HOT RLD
33001*	IMPELLER NUT	664	AUS ST ASTMA194/194M-8M-UNS S31600 (NUT
41000*	LOCK WASHER-IMPELLER NUT	054	SPRING ST IS:4072-80C6
44100	GREASE NIPPLE	444	CS IS:1367 Part3 CL4.6 CDP
50200*	FELT RING	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-SHAFT SLEEVE	702	NON ASBESTOS FERROLITE NAM37 OR EQ

PUMP	**DB 65/26**	MOC	16
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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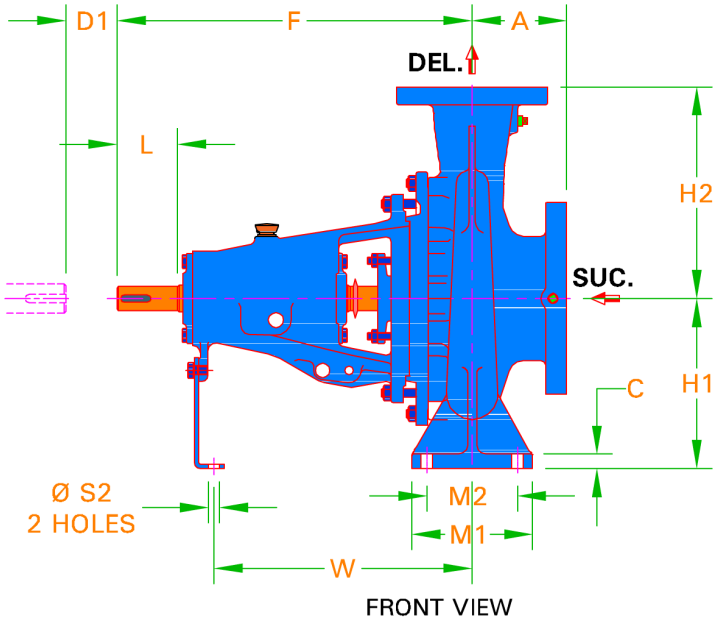
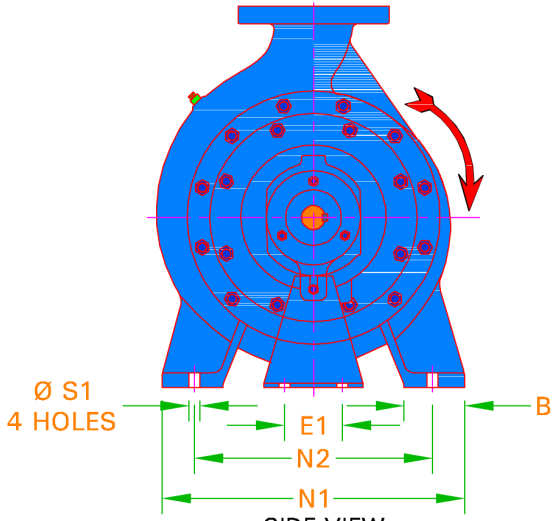
CROSS SECTIONAL DRAWING

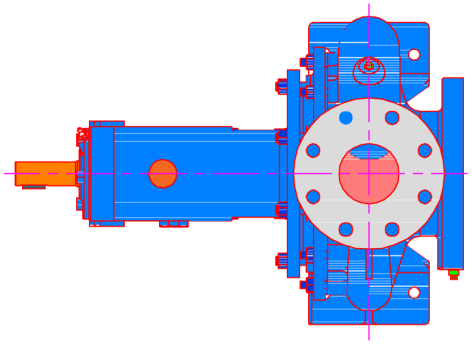
DRAWING NO. **TC02-1**



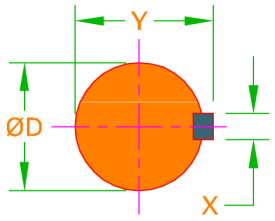
FRONT VIEW



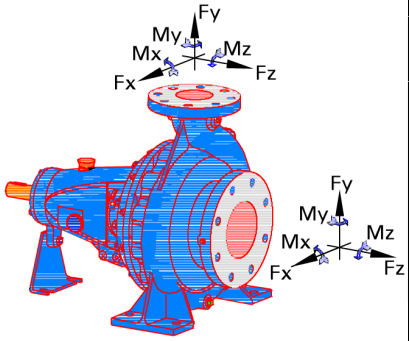
SIDE VIEW



TOP VIEW



SHAFT END DETAILS



NOZZLE LOADING

NOTES:

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

A	F	H1	H2	B	C	M1	M2	N1	N2	S1	E1	S2	W	-	D
100	470	200	250	80.00	16.00	160	120	360	280	18.00	110	14.00	342	-	32.00

X	Y	L	D1	-	-	-	-	-	-	-	-	-	-	-	-
10.00	25.00	80.00	140	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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PUMP DUTIES

CAPACITY	80.00 m3/h	EFFICIENCY	66.31 %
TOTAL HEAD	68.00 m	PUMP INPUT	22.73 kW
DENSITY	0.998 kg/dm3	NPSHR	2.56 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
SUCTION	80.00 mm	N.A.	160 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	M
SUCTION	68.00 kgf	170.0 kgf	136.0 kgf	1,020 N.m	510 N.m	510
DELIVERY	57.00 kgf	142.0 kgf	114.0 kgf	843 N.m	422 N.m	422

TAPPING DETAILS

DESCRIPTION	SIZE / TYPE
Suction Gauge	1/2"BSP
Delivery Gauge	1/2"BSP
Casing Drain	3/8"BSP
Casing Vent	NA
Bearing Cooling in / out	NA
Pad Cooling in / out	NA
Priming in	NA
Base Drain	NA

DIRECTION OF ROTATION FROM DE	CLOCKWISE

PUMP	**DB 65/26**	PUMP WT.	81.00
		GD^2	0.02 kg
REC. DRIVER RATING	30KW	RATED SPEED	2950R
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

DRAWING NO.	TL02-1-