





REV.	DATE	DESCRIPTION	DRN. BY	CHD. BY	APPD. BY
00	1-SEP-2017	1 ST ISSUE	D.K.	F.O.	N.N
01	25-SEP-2017	2 nd ISSUE	D.K.	F.O.	N.N
02	16-OCT-2017	3 rd ISSUE	D.K.	F.O.	N.N
03	16-NOV-2017	4 TH ISSUE	D.K.	Y.I.	N.N
04	05-Dec-2017	5 th ISSUE	D.K.	F.O.	N.N
05	09-Jan-2018	6 th ISSUE	F.O.	N.N.	N.N
06	07-Feb-2018	7 th ISSUE	N.Ni	Y.I	N.Na

Tag number:

Unit 1 - 01PAC00AP501, 01PAC00AP502

Unit 2 - 02PAC00AP501, 02PAC00AP502

CLIENT			
CLIENT'S ENGINEER			
EPC CONTRACTOR			
PROJECT	OLKARIA V GEOTHERMAL POWER DEVELOPMENT PROJECT (2 x 70MW)		
PACKAGE	REINJECTION PUMP		
VENDOR	 DMW SERIAL NO. 1111055		
DOCUMENT TITLE	PUMP DATASHEET		
DOC. NO. :	13-OH2T101-00046X		

REINJECTION WATER PUMP DATA SHEET







(1) Ambient air includes H₂S due to geothermal area. So below conditions are required.

*Edges should be tinned and coated.

(2) *A): Starting torque curve to be submitted.

(1) *B): Allowable nozzle force and moment shall not be less than specified value in API 610.

1. <u>Data sheet of Reinjection Pump in Winter condition(Summer condition)</u>				To be supplied	NO. OF PUMPS	2 x 100% Per units	
					Total no of Pumps	4 Nos	
				INSTALLATION	INDOOR/ OUTDOOR		
ITEM				MHPS-IND REQUIREMENTS	SPECIFICATION	REMARKS	
DESIGN CONDITIONS	Type *		Multistage Horizontal Centrifugal Pumps	Single-stage Horizontal Centrifugal Pumps			
	Drive *		Motor	Motor			
	Model No		*1	150x100-364			
	Fluid *	Temperature (°C)	27.9(35.9)	27.9(35.9)			
		Max. Temperature(°C)	60	60			
		Density (kg/m3)	996.3(993.7)	996.3(993.7)			
		Water quality	Geothermal Condensate water	Geothermal Condensate water			
	Capacity*	Max. Discharge (m³/h)	225(115)	225(115)			
	Pump Suction Pressure (bar)		0.93 (0.96) $\Delta_5 \Delta_6$	0.93(0.96) $\Delta_5 \Delta_6$			
	Design Atmospheric Pressure (bar)		0.8 bar	0.8 bar			
	Total Pump Head (m)		180(170)	180(170)			
	NPSH(Available) (m)		16.2	16.2			
	NPSH (Required) (m)		*1	6.6 (4.1) Δ_1	Should be less than 12.5m		
	Total shut of head (m)		*1	Δ 202 (174)	Less than 125% rated head		
	Pump efficiency		*1	72 (62.5) Δ_1	Should be more than 62.3% for summer condition		
	Rotating speed		*1	Δ 2974 (2765)			
	Shaft seal		Mechanical seal	Mechanical seal			
	Pump shaft power (BKW)		*1	153 (85.4) Δ_1			
	Critical Speed		*1	207% of rated speed	More than 125% of rated speed		
	Casing design pressure		*1	31 barg	1.5 times of Shutoff pressure		
	Hydro test pressure		*1	47 barg	1.5 times of design pressure		
	No of impeller		*1	One (1)			
	Rotating direction		*1	CCW (viewed from DE)			
	Starting Torque Nm & Moment of Inertia Kgm2(*A):		*1	Please refer torque curve			
*	Coupling		Spacer type coupling	Spacer type coupling			
	Bearing						
	Type of bearing		*1	Anti-friction			

	Direction / force (Maximum) KN	*1		
	Pump Material			
*	Casing	SCS16 or equivalent	ASTM A743 CF3M 	
*	Impeller	SCS16 or equivalent	ASTM A743 CF3M 	
*	Shaft	SUS316L or equivalent	ASTM A276 316L 	
*	Shaft Sleeves	SUS316L or equivalent	N/A	
*	Base Plate	SS400 or equivalent	ASTM A36	
	Suction Nozzle (*B)	AISI 316 L Stainless steel or equivalent	ASTM A743 CF3M 	Integrated with casing
	Discharge Nozzle (*B)	AISI 316 L Stainless steel or equivalent	ASTM A743 CF3M 	Integrated with casing
	Motor			
	Type	TEFC	TEFC	
	Insulation Type	F	F	
	Limit of temperature raise	B	B	
	Capacity (kw)	*1	180	Shall not be more than 180kW
	Synchronous Speed	Variable Speed	Variable Speed	Determined by vendor
	Voltage (v)	415	415	
	Motor efficiency	*1	95.8 	Not less than 95%
	Utilities			
	Seal Cooling water requirement (l/min) & Temperature of water °C	*1	N/A	
	Interface			
	Pump inlet (*B):			
	a) Flange standard	*1	ASME B16.5	
	b) Type of Flange	*1	#300 RF (Non-serrated)	
	c) Size of Flange	*1	6 inch	
	Pump Outlet (*B):			
	a) Flange standard	*1	ASME B16.5	
	b) Type of Flange	*1	#300 RF (Non-serrated)	
	c) Size of Flange	*1	4 inch	
	Seal water Inlet:			
	a) Flange standard	*1	N/A	
	b) Type of Flange	*1	N/A	
	c) Size of Flange	*1	N/A	
	Air Vent Pipe:			
	a) Flange standard	*1	N/A	
	b) Type of Flange	*1	N/A	
	c) Size of Flange	*1	N/A	
	Drain pipe			
	a) Flange standard	*1	ASME B16.5	
	b) Type of Flange	*1	#300 RF	
	c) Size of Flange	*1	3/4 inch	

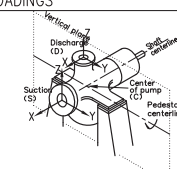
1	<input type="radio"/> CUSTOMER/SITE M/s KENGEN (KENYA)				REV.	DATE	PREP. BY	CHEC. BY	APP. BY
2	<input type="radio"/> PROJECT/UNIT OLKARIA V GEOTHERMAL POWER DEVELOPMENT PROJECT (2 x 70MW)				0	2018/2/7	D.K.	F.O.	N.N.
3	<input type="radio"/> PURCHASER M/s MHPS INDIA <input type="radio"/> WORK/JOB NO.								
4	<input type="radio"/> TAG NO. 01PAC00AP501, 01PAC00AP502, 02PAC00AP501, 02PAC00AP502								
5	<input type="radio"/> SERVICE REINJECTION PUMP								
6	<input type="radio"/> NO. REQUIRED 4Nos (2x100%per Unit x 2) <input type="radio"/> △								
7	<input type="checkbox"/> MFR DMW CORPORATION <input type="checkbox"/> MODEL SMKP-M <input type="checkbox"/> SERIAL NO. 1111055								
8	○ OPERATING CONDITIONS ()								
9									
10									
11	<input type="radio"/> AUTOMATIC START : ITEM NO. ()				<input type="radio"/> INTERMITTENT USE (START/DAY)		<input type="radio"/> PARALLEL RUNNING		Rev
12	LIQUID Condensate water (Geothermal Steam) () HAZARDOUS				CAPACITY NOR. (m3/h)		RATED 225 (m3/h)		
13	CORR./ERO. BY H2S ENVIRONMENT () FLAMMABLE				OTHER				
14	PUMP.TEMP. NOR. 27.9 MIN. - MAX. 60 (Deg.C)				SUCT.PRESS.MIN/MAX./RA 0.93 △ △		barg		
15	SPEC.GRAV.@NOR.TEMP. 0.9963 MAX. -				DISCH.PRESS.		barg		
16	VAPOR PRESS. kg/cm2(a) @ (Deg.C)				DIFF.PRESS.		barg		
17	VISCOSITY (cst) @ (Deg.C)				DIFF.HEAD 180 (m)		NPSHA 16.2 (m)		
18	MELTING POINT (Deg.C)				LOCATION:AMB.TEMP 5 to 40 (Deg.C)		() INDOOR (X) OUTDOOR		
19	CONSTRUCTION				HAZARD AREA CLASS				
20					MATERIALS				
21									
22	<input checked="" type="checkbox"/> PUMP TYPE () OTHER				<input type="radio"/> API CODE:				
23	() OH1 (X) OH2 () OH3 () OH4 () OH5 () OH6				<input checked="" type="checkbox"/> CASE △ A743 CF3M				
24	() BB1 () BB2 () BB3 () BB4 () BB5				<input checked="" type="checkbox"/> IMPELLER/INDUCER △ A743 CF3M /				
25	() VS1 () VS2 () VS3 () VS4 () VS5 () VS6 () VS7				<input checked="" type="checkbox"/> WRG RING CASE/IMP. △ SS316L HARDFACED / SS316L HARDFACED △				
26	<input type="checkbox"/> CASE TYPE () SINGLE-VOL. (X) DBL-VOL. () DIFFUSER				<input checked="" type="checkbox"/> SHAFT △ SS316L <input checked="" type="checkbox"/> SLEEVE SS316L				
27	<input type="checkbox"/> CASE JACKET () FULL () PARTIAL				<input checked="" type="checkbox"/> CASE GASKET SUS316L+GRAPHITE <input checked="" type="checkbox"/> SHAFT TUBE -				
28	<input checked="" type="checkbox"/> NOZZLE SIZE TYPE/RATING FACE POSITION				<input checked="" type="checkbox"/> BRG HOUSING A216 WCB				
29	SUCTION 6" ASME / 300 RF END				<input checked="" type="checkbox"/> CPLG GUARD ALUMINIUM				
30	DISCHARGE 4" ASME / 300 RF TOP								
31									
32	<input checked="" type="checkbox"/> NO.OF STAGES ONE				<input type="checkbox"/> PERFORMANCE				
33	IMPELLER : (X) CLOSED () SEMI-OPEN () OPEN								
34	(X) SINGLE SUCT. () DBL SUCT. () W/INDUCER								
35	DIA.RATED 364 (mm) MAX/MIN 368 / 290 (mm)				RPM △ 2974 NPSH REQ'D 6.6 (m)				
36	<input checked="" type="checkbox"/> BRG RADIAL BALL NO. 6215 △				EFF. 72 (%) RATED POWER △ 153 (kW)				
37	THRUST BALL NO. 7314BDB △				MAX POWER @RATED IMP. 173 (kW)				
38	<input checked="" type="checkbox"/> LUBE (X) FLINGER () FLOOD () RING OIL () PRESS.				MIN.CONT.FLOW TH. 24 ST. 70 (m3/h)				
39	() GREASE () PURE MIST () PURGE MIST				SUCT.SP.SPEED (min ⁻¹ .m3/min.m) 1620				
40	POWER TRANSMISSION (X) DIRECT () GEAR ()				SHUT-OFF HEAD @RATED IMP. 202 (m)				
41	<input checked="" type="checkbox"/> CPLG (X) FLEX.DISK () FLEX.FLG () GEAR () RIGID				MAX.DISCH.PRESS.@RATED IMP. 20.2 barg				
42	(X) SPACER MFR/MODEL NO. REXNORD OR DIDO /				<input checked="" type="checkbox"/> MAX.ALLOW.WORK.PRESS. 31 barg 60 (Deg.C)				
43	<input type="checkbox"/> ROTATION VIEWED FROM CPLG END () CW (X) CCW				<input checked="" type="checkbox"/> HYDRO.TEST PRESS.CASE/JKT 47 barg				
44	<input type="checkbox"/> BASE PLATE (X) COMMON () SOLE () SEPARATE				<input checked="" type="checkbox"/> CASE PNEUM.TEST PRESS. - barg				
45	VERT.PUMP: <input type="radio"/> SUMP DEPTH - (m) <input checked="" type="checkbox"/> PUMP LENGTH - (m) <input checked="" type="checkbox"/> LINE SHAFT () OPEN () ENCLOSED								
46	<input checked="" type="checkbox"/> GUIDE BUSHING: MAT'L <input type="checkbox"/> LUBE () EXT.WATER () OIL () GREASE () PUMPAGE								
47	<input type="checkbox"/> PUMP THRUST RATED(UP/DOWN) - / - (N) <input type="radio"/> WITH SUCTION STRAINER								
48	<input checked="" type="checkbox"/> SHAFT SEAL () SEAL-LESS								
49	() PACKING: MFR MAT'L SIZE NO.OF RINGS								
50	(X) MECH.SEAL: MFR EBI API CODE - SIZE (SINGLE SEAL)								
51	MAT'L: FACES VS METAL ON-RING								
52	TYPE (X) SINGLE () DUAL UN-PRESS. () DUAL PRESS. () DOUBLE(BACK TO BACK)								
53	(X) CARTRIDGE () HOOK SLEEVE () INSIDE () OUTSIDE () ROTATING () STATIONARY								
54	() MULTIPLE SPRING () SINGLE SPRING () METAL BELLOWS () AUX. SEAL DEVICE								
55	<input checked="" type="checkbox"/> AUXILIARY PIPING <input type="radio"/> INLET CONDITION <input type="checkbox"/> FLOW <input checked="" type="checkbox"/> API <input checked="" type="checkbox"/> MAT'L <input checked="" type="checkbox"/> PURCHASER'S CONNECTIONS								
56	<input checked="" type="checkbox"/> SERVICE <input type="radio"/> FLUID (kPaG) (Deg.C) (m3/h) PLAN NO. (#0) SIZE TYPE/RATING FACE								
57	COOLING N/A								
58									
59	FLUSH (PRIM.) 31								
60	(AUX.)								
61	QUENCHING								
62									
63									
64	<input checked="" type="checkbox"/> PRESS.CASE CON'N () VENT WITH () VALVE () CAP () PLUG () FLANGE (SIZE /RATING /FACE)								
65	(X) DRAIN WITH (X) VALVE () CAP () PLUG (X) FLANGE (SIZE 3/4 /RATING 300 /FACE RF)								
66	<input type="radio"/> MOTOR 4Nos (2x100%per Unit x 2) △				<input type="radio"/> TURBINE (ITEM NO.) NO. (0 + 0)				
67	<input type="radio"/> PRVID.BY Vendor <input type="radio"/> MOUNT.BY DMW				<input type="radio"/> PROVID.BY <input type="radio"/> MOUNT.BY				
68	<input checked="" type="checkbox"/> MFR HHI <input checked="" type="checkbox"/> TYPE/ENCLOSURE TEFC/ IP55				<input checked="" type="checkbox"/> MFR <input checked="" type="checkbox"/> TYPE				
69	<input type="checkbox"/> RATED OUTPUT 180 (kW) POLES 2				<input type="checkbox"/> RATED OUTPUT (kW) <input type="checkbox"/> min ⁻¹				
70	<input type="checkbox"/> PHASE 3 <input type="radio"/> Hz 50 <input type="radio"/> VOLT 415				<input checked="" type="checkbox"/> VERT.THRUST CAP (UP / DOWN) - / - (N)				
71	<input checked="" type="checkbox"/> VERT.THRUST CAP. (UP / DOWN) - / - (N)				<input type="radio"/> CODES / STANDARD / ENG.SPEC				
72	REMARKS 1. Carbon steel material used in the pump are painted as per the MHPS painting specification for H2S environment.								
73	△ 2. i. Vibration limit for the pump : As per ISO 10816-7 Category-1 Zone-A								
74	ii. Noise Limit for the pump : 85dB(A) at Site.								
75	△ 3. Suction Specific speed at 6.6m, 3.75m3/min, 2974min⁻¹ : 1399 △								
76	△ 4. Instruments provided for the Pump : RTD & Temperature Transmitter, Vibration Probe & Vibration Transmitter								
75	<input type="radio"/> Casing Design Press. 31 barg								
76	<input type="radio"/> Casing Design Temp. 60 (Deg.C)								

NOTE: ☐ INDICATES INFORMATION COMPLETED BY PURCHASER ☐ BY MANUFACTURE ☒ BY MANUFACTURE OR PURCHASER
 FLANGE RATING : Lb or K SIZE : inch (#0) MATERIAL : P(PIPING) T(TUBING) CS(C.STL) SS(S.STL) CU(COPPER) or ACTUAL MAT'L
 (X) : INQUIRED or APPLIED (*) : VENDOR'S CHOICE (#) : REMARKED (R) : IF REQUIRED

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REVISIONS				
NO.	DESCRIPTION	DATE	APPROVED	CHECKED
1	FOR APPROVAL	27-Sep-2017	N. N.	F. O.
2	FOR APPROVAL	24-Oct-2017	N. N.	F. O.
3	FOR APPROVAL	11-Nov-2017	N. N.	Y. I.

NOZZLE LOADINGS			
FORCES (N)	SUC.		DIS.
	Fx	Fy	Fz
MOMENTS (N-m)	Fx	± 3110	± 1420
	Fy	± 2490	± 1160
	Fz	± 2050	± 1780
	Fr	± 4480	± 2560
	Mx	± 2300	± 1330
	My	± 1180	± 680
	Mz	± 1760	± 1000
	Mr	± 3130	± 1800



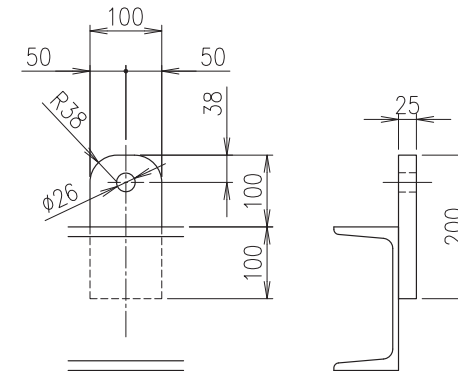
NO.	CONNECTION	MATERIAL	QUANTITY	SIZE & RATING
A	PUMP SUCTION	A743 CF3M or Equiv.	2x100% /Unit x 2 Units = Total 4 Nos	6" ASME #300 RF
B	PUMP DISCHARGE	A743 CF3M or Equiv.	2x100% /Unit x 2 Units = Total 4 Nos	4" ASME #300 RF
C	CASING DRAIN	A182 316L	2x100% /Unit x 2 Units = Total 4 Nos	3/4" ASME #300 RF
D	SKID BASE DRAIN	A105	2x100% /Unit x 2 Units = Total 4 Nos	2" ASME #150 RF

RF: RAISED FACE
(Non-serration)

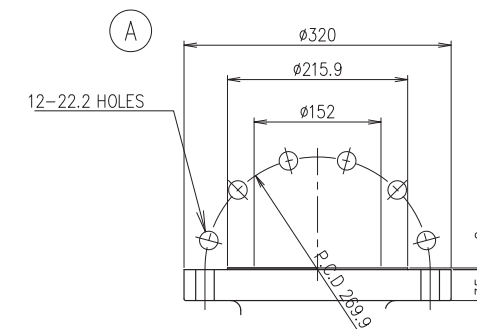
APPROX. MASSES (kg)		
	DRY	WET
PUMP	370	385
BASEPLATE	830	830
MOTOR	1710	1710
AUX. PARTS	100	150
TOTAL	3010	3075

LOADING DATA	
STATIC LOAD	3075kg
DYNAMIC LOAD	615kg
OPERATING LOAD	3690kg

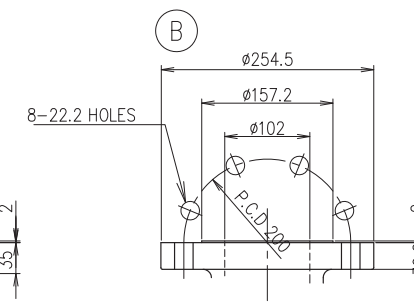
CENTRE of GRAVITY POINT		
	DRY	WET
x	1143	1149
y	0	0
z	444	445



DETAIL OF LIFTING LUG



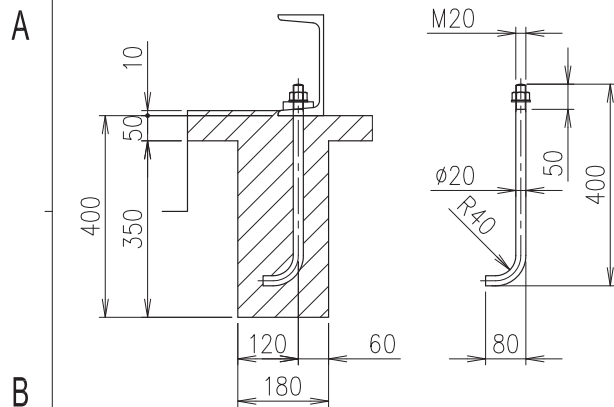
DETAIL OF SUCTION FLANGE (S=1/8)
(150 ASME B16.5-2003 CLASS 300 RF)



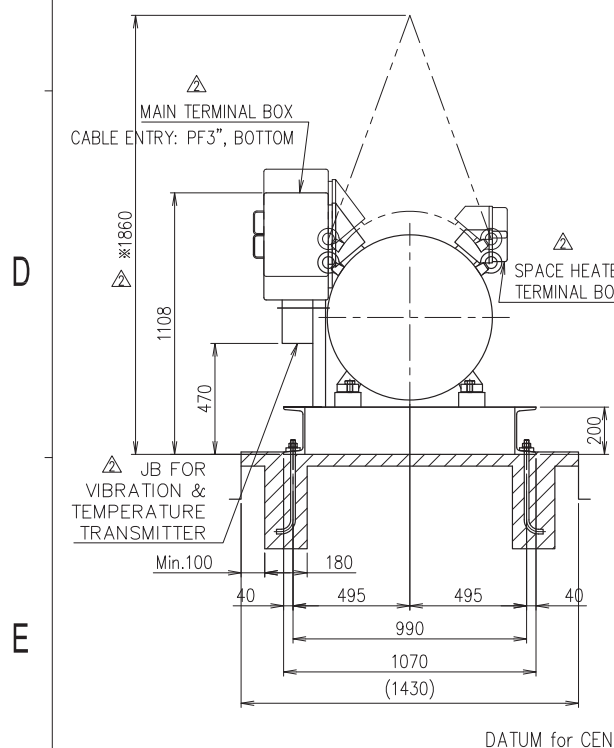
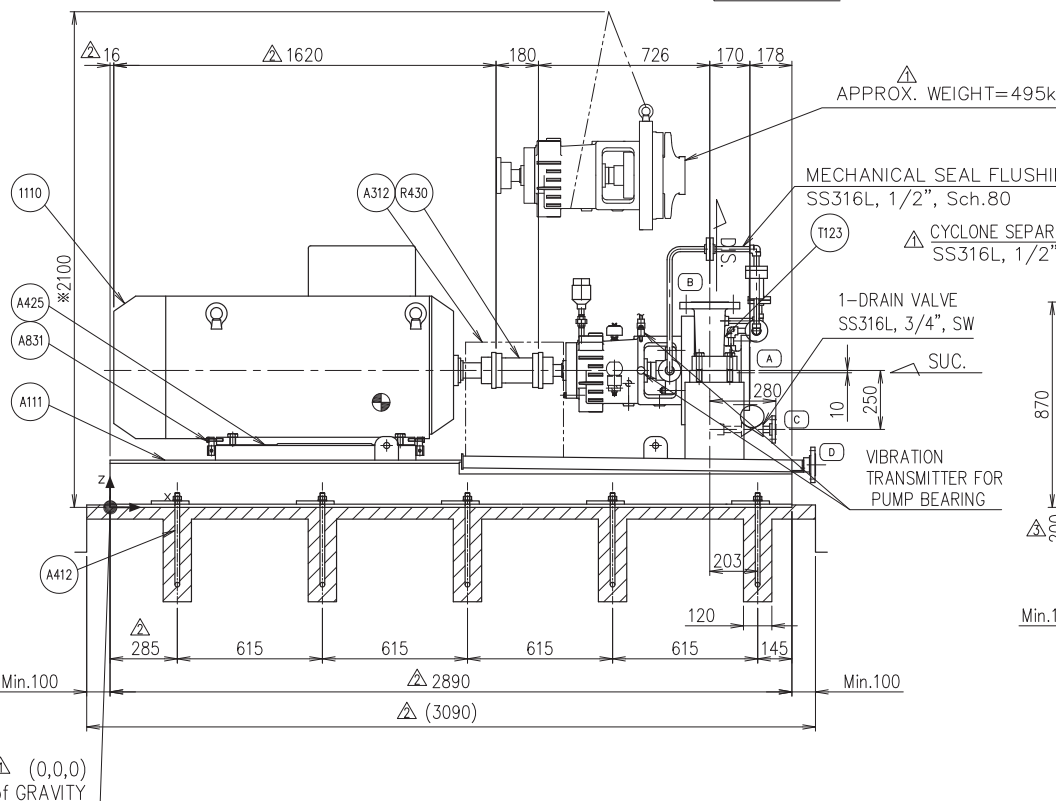
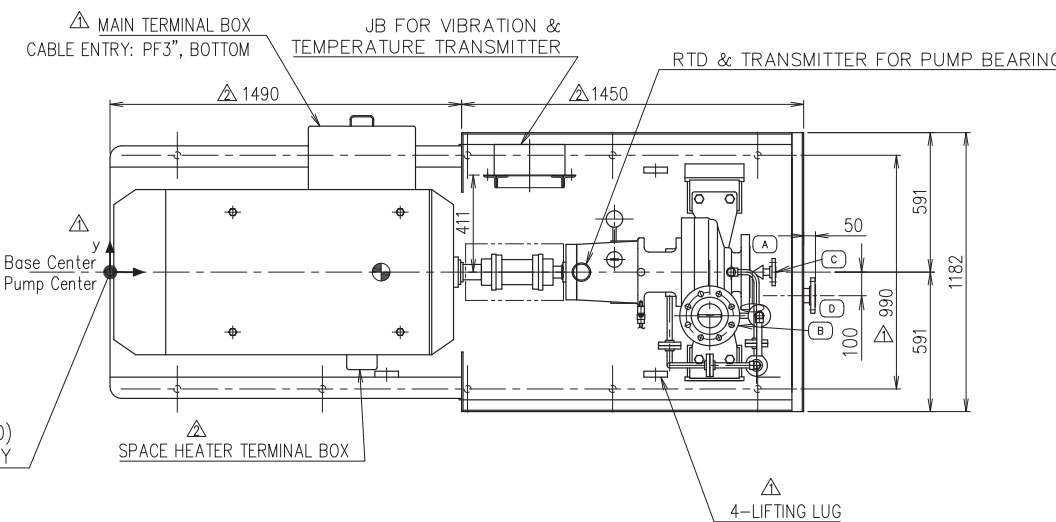
DETAIL OF DISCHARGE FLANGE (S=1/8)
(100 ASME B16.5-2003 CLASS 300 RF)

PUMP SPECIFICATION		
	Winter Condition	Summer Condition
TOTAL HEAD (m)	180	170
FLOW (m³/H)	225	115
SPEED (min-1)	2980	2765

GL+000 = EL+2007.00(m)



DETAIL OF FOUNDATION BOLT



符号 NO.	部品名称 PART NAME	材料 MATERIAL	数量 QUANTITY	備考 REMARKS
T123	PUMP		2x100% /Unit x 2 Units = Total 4 Nos	150x100-364 SMK-P-M
1110	MOTOR		2x100% /Unit x 2 Units = Total 4 Nos	180kW x 415V x 2P
R430	COUPLING		2x100% /Unit x 2 Units = Total 4 Nos	FLEXIBLE COUPLING
A111	SKID BASE	A36	2x100% /Unit x 2 Units = Total 4 Nos	
A312	COUPLING GUARD	ALUMINIUM	2x100% /Unit x 2 Units = Total 4 Nos	
A412	FOUNDATION BOLTS	STAINLESS STEEL	20x100% /Unit x 2 Units = Total 40 Nos	M20x400L
A425	SHIMS	A240 304	2x100% /Unit x 2 Units = Total 4 sets	FOR MOTOR
A831	ALIGNMENT PIECES	A36	16x100% /Unit x 2 Units = Total 32 sets	

Tag No.:
Unit 1 - 01PAC00AP501, 01PAC00AP502
Unit 2 - 02PAC00AP501, 02PAC00AP502

NOTE:
1) PUMP IS SELF VENTING.
2) DIMENSION MARKED "※" SHOWS FOR MAINTENANCE.
(USE THE SUITABLE HANGER CHAINS FOR SAFETY.)

DMW Serial No. 1111055

ORDER	
ITEM	
SECTION	
DRAWN	D. Kshirsagar
CONFERRED	CHECKED F. Oba
	APPROVED N. Nakatani
	ISSUED 23, Aug. 2017
	Hydraulic Machinery Design Department

EMPLOYER	ENGINEER
KenGen Energy for the nation	SGC GEOTHERMAL POWER
CONTRACTOR	
Mitsubishi Corporation	MITSUBISHI HITACHI POWER SYSTEMS
H YOUNG & CO. (EAST AFRICA) LTD.	
140MW Oikaria V GPP Lot-II	
RP-EQUIPMENT GENERAL ARRANGEMENT DRAWING WITH FOUNDATION ARRANGEMENT DRAWING, TERMINAL POINTS & NOZZLE LOADING	
SCALE 1:12	DRAWING NO. 13-OH2T122-00044X
VENDOR	REV. NO 3 SHEET NO 1/1
株式会社電業社機械製作所 DMW CORPORATION	

REV.	DATE	DESCRIPTION	DRN. BY	CHD. BY	APPD. BY
00	15-SEP-2017	1 ST ISSUE	D.K.	F.O.	N.N
01	23-OCT-2017	2 nd ISSUE	D.K.	F.O.	N.N
02	20-NOV-2017	3 RD ISSUE	D.K.	Y.I.	N.N

Tag number:

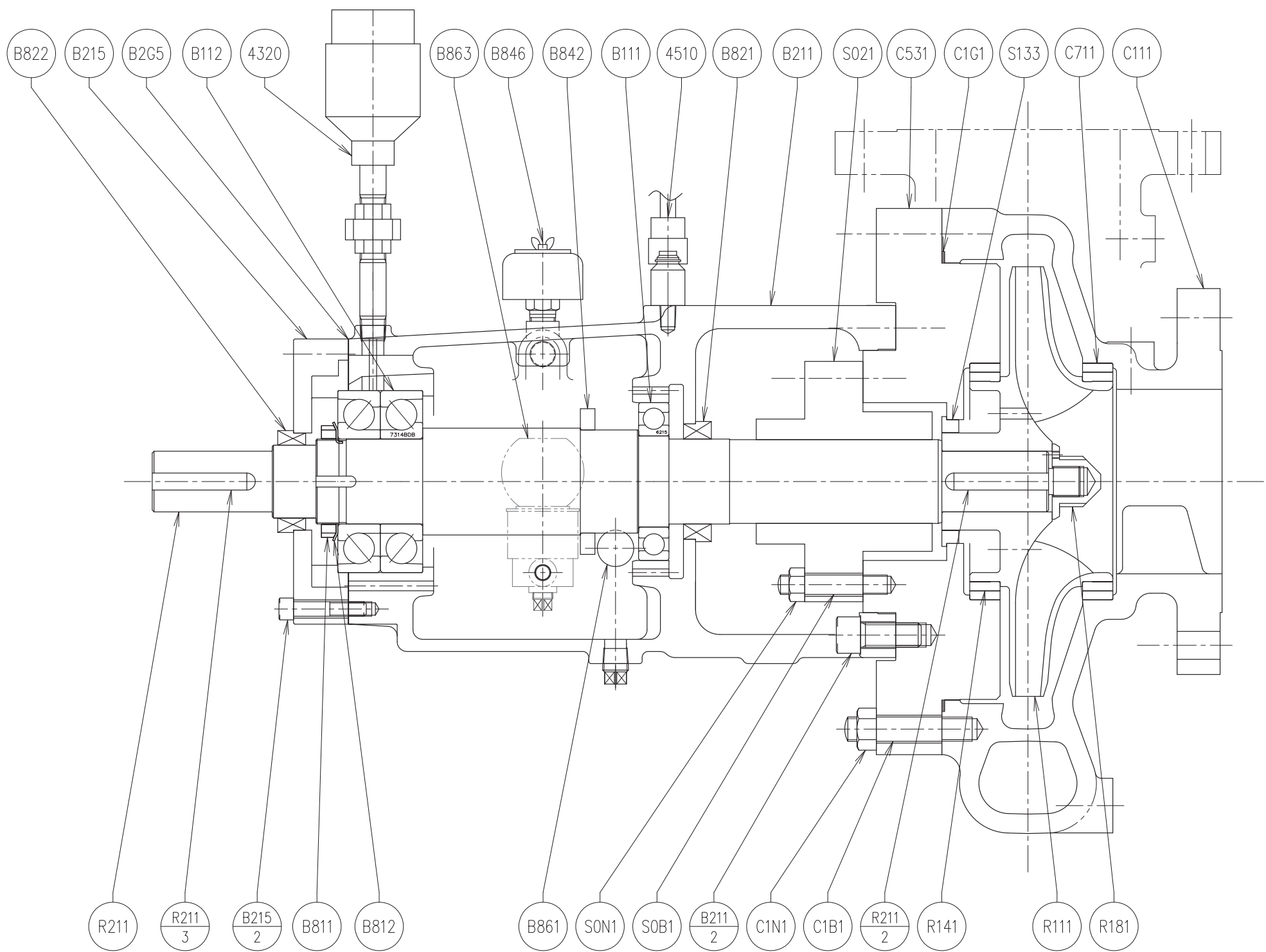
Unit 1 - 01PAC00AP501 , 01PAC00AP502

Unit 2 - 02PAC00AP501, 02PAC00AP502

CLIENT					
CLIENT'S ENGINEER					
EPC CONTRACTOR	  				
PROJECT	OLKARIA V GEOTHERMAL POWER DEVELOPMENT PROJECT (2 x 70MW)				
PACKAGE	REINJECTION PUMP				
VENDOR	 DMW CORPORATION DMW SERIAL NO. 1111055				
DOCUMENT TITLE	Pump Sectional Drawing with Parts List				
DOC. NO. :	13-OH2T123-00048X				

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REVISIONS				
NO.	DESCRIPTION	DATE	APPROVED	CHECKED
1	Revised	23.10.17	N.N.	F.O.
2	Revised	17.11.17	N.N.	Y.I.






Tag No.:
Unit 1 – 01PAC00AP501, 01PAC00AP502
Unit 2 – 02PAC00AP501, 02PAC00AP502

ORDER	
ITEM	
SECTION	
DRAWN	D. Kshirsagar
CONFERRED	CHECKED F. Oba
	APPROVED N. Nakatani
ISSUED	15, SEPT, 2017
	Hydraulic Machinery Design Department

EMPLOYER	ENGINEER	
		
CONTRACTOR	140MW Olkaria V GPPP Lot- II	
		
RP-Pump Cross Sectional Drawing with BOM		
SCALE	DRAWING NO.	REV. NO. SHEET NO.
1:2	13-OH2T123-00048X	2 3/5
VENDOR		

DMW Serial No. 1111055

BILL OF MATERIAL

PART No.	PART NAME	MATERIAL	QT'Y / UNIT	REMARKS
		ASTM		
R111	IMPELLER	A743 CF3M	1	
R141	IMPELLER WEAR RING	A276 316L	2	
R181	IMPELLER NUT	A276 316L	1	
R211	SHAFT	A276 316L	1	
R211-2	IMPELLER KEY	A276 316L	1	14x9x78L 
R211-3	COUPLING KEY	A576 1045	1	14x9x78L 
C111	CASING	A743 CF3M	1	
C1B1	CASING STUD	SS304	1 set	
C1N1	NUT FOR CASING STUD	SS304	1 set	
C1G1	CASING GASKET	A240 316L+GRAPHITE	1	SPIRAL WOUND
C531	CASING COVER	A743 CF3M	1	
C711	CASE WEAR RING	A276 316L	2	
S021	MECHANICAL SEAL	MFR. STD.	1	
S0B1	MECH. SEAL STUD	A193 B8M	1 set	
S0N1	NUT FOR MECH. SEAL STUD	A194 B8M	1 set	
S133	THROAT BUSHING	A276 316L	1	
B111	RADIAL BEARING	A295,52100	1	#6215
B112	THRUST BEARING	A295,52100	1 set	#7314BDB
B211	BEARING HOUSING	A216,WCB	1	
B211-2	HS BOLT FOR BRG. HOUSING	AISI4135	1 set	
B215	BEARING COVER	A283C	1	
B215-2	HS BOLT FOR BRG. COVER	AISI4135	1 set	
B2G5	BEARING COVER GASKET	NON ASBESTOS	1 set	Type : AF120 
B811	BEARING LOCK NUT	A283C	1	
B812	BEARING LOCK WASHER	A109	1	
B821	BEARING ISOLATOR INBOARD	STAINLESS STEEL	1	
B822	BEARING ISOLATOR OUTBOARD	STAINLESS STEEL	1	
B842	OIL FLINGER	B584,C83600	1	
B846	AIR BREATHER	MFR. STD.	1	
B861	OIL LEVEL GAUGE	MFR. STD.	1	
4323	RTD WITH TRANSMITTER	MFR. STD.	1	
4510	VIBRATION TRANSMITTER	MFR. STD.	2	

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DETAILS

PART	DETAILS
PIPING	SS316L, 1/2", Sch.80
FLANGES	SS316L, SW, ASME #300, RF
VALVE	SS316L, 1/2", Class 800Lbs, SW
CYCLONE SEPARATOR	SS316L, 1/2", SW

No.	CONNECTION	MATERIAL	Q'TY	SIZE & RATING
A	PUMP SUCTION	A743 CF3M	1	6" ASME #300 RF
B	PUMP DISCHARGE	A743 CF3M	1	4" ASME #300 RF
C	CASING DRAIN	A182 316L	1	3/4" ASME #300 RF
D	SKID BASE DRAIN	A105	1	2" ASME #150 RF

PER 1 UNIT

RF:RAISED FACE
(NON SERRATION)

SYMBOL MARK

—	PROCESS LINE
--	SIGNAL LINE Δ
###	ELECTRICAL LINE
Δ	GATE VALVE
	CYCLONE SEPARATOR
	FLANGE
	RESIST. TEMP. DETECTOR
	TEMPERATURE TRANSMITTER
	VIBRATION TRANSMITTER
JB	JUNCTION BOX
TB	TERMINAL BOX

MHPS-I SCOPE DMW SCOPE

Δ Note – Auxiliary piping mounted on the pump will also be supplied by DMW

BEARING HOUSING

NO.	TAG NO.				REMARKS
	UNIT-1		UNIT-2		
	Pump-A	Pump-B	Pump-C	Pump-D	
TE	01PAC00CT001	01PAC00CT002	02PAC00CT001	02PAC00CT002	RTD for Pump Thrust Bearing
TT	01PAC00CT111	01PAC00CT112	02PAC00CT111	02PAC00CT112	TT for Pump Thrust Bearing
VT1	01PAC00CY401	01PAC00CY403	02PAC00CY401	02PAC00CY403	VT for Pump Housing
VT2	01PAC00CY402	01PAC00CY404	02PAC00VY402	02PAC00CY404	VT for Pump Housing
JB	01PAC00GH501	01PAC00GH502	02PAC00GH501	02PAC00GH502	Junction Box for TE, TT, VT
MOTOR	01PAC00AP501-M01/3	01PAC00AP502-M02	02PAC00AP501-M01/3	02PAC00AP502-M02	
VFD	01PAC00AP501-N01	01PAC00AP502-N02	02PAC00AP501-N01	02PAC00AP502-N02	
CYCLONE SEPERATOR	01PAC00AT151	01PAC00AT152	02PAC00AT151	02PAC00AT152	
VALVE	01PAC00AA991	01PAC00AA992	02PAC00AA991	02PAC00AA992	

Δ Tag No.:
Unit 1 – 01PAC00AP501, 01PAC00AP502
Unit 2 – 02PAC00AP501, 02PAC00AP502

NO.	DESCRIPTION	DATE	APPROVED	CHECKED	DRAWN
4	FOR APPROVAL	17/Jan/2018	N. N.	N. N.	F. O.
3	FOR APPROVAL	8/Jan/2018	N. N.	N. N.	F. O.
2	FOR APPROVAL	17/Nov/2017	N. N.	T. F.	T. F.
1	FOR APPROVAL	25/Sep/2017	N. N.	F. O.	D. K.
0	FOR APPROVAL	04/Sep/2017	N. N.	F. O.	D. K.

REVISIONS

	PUMP SPECIFICATION	
	Winter Condition	Summer Condition
TOTAL HEAD (m)	180	170
FLOW (m ³ /H)	225	115
SPEED (min-1)	Δ 2974	2765
EFFICIENRY (%)	72	62.5

DMW Serial No. 1111055

CONFERRED	CHECKED
	F. Oba
	APPROVED
	N. Nakatani
	ISSUED
	4. Sep. 2017
	Hydraulic Machinery Design Department

EMPLOYER	ENGINEER	
CONTRACTOR		
140MW Olkaria V GPPP Lot- II		
PIPING AND INSTRUMENTATION DIAGRAM FOR REINJECTION PUMP		
SCALE	DRAWING NO.	REV. NO
~	13-OH2T139-00041X	4
VENDOR	SHEET NO	
	1/1	