






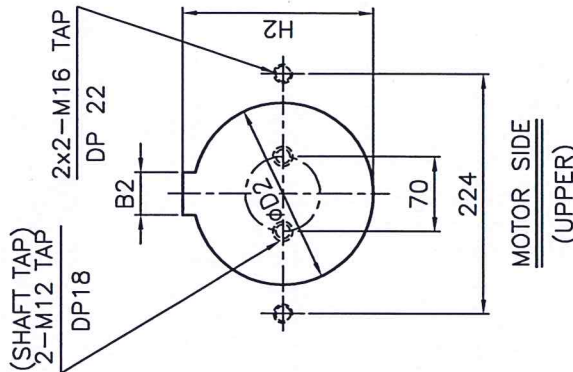
# APPENDIX-7

TORISHIMA PUMP DATA SHEET ( TYPE : SPTV )						Rev.	Date	Approved by	Checked by	Revised by	Rev.	
1	Customer	MITSUBISHI HITACHI POWER SYSTEMS INDIA PVT. LTD.				Location	Outdoor					
2	End User	KENYA ELECTRICITY GENERATING COMPANY LIMITED				No. Required	2x50% per unit	(Total) 4	(Working) 4	(Standby) 0		△
3	Project Name	Olkaria-V 2x70MW Unit 1&2- Geothermal Power Plant (LOT2), Kenya				Driver	Motor					
4	Item No.	01PAC01AP101/102-Unit1 ,02PAC01AP101/102-Unit2				Standards	JIS and Manufacturers' Standards / API / ASTM / ISO					△
5	Service	Hot Well Pump				Pump Type	SPTV900 Vertical Barrel-type Mixed-flow Single-Suction Closed Impeller Pump					△
6	Production No.	PU0196266/74				Installation	One Floor / Dry Pit					
7	OPERATING CONDITIONS						PERFORMANCE					
8	Liquid Name	Geothermal Condensate Water		Flow ( Design )	9600 m <sup>3</sup> /h	Speed	490 min <sup>-1</sup>					
9	Pumping Temp. ( Normal / Max. )	35.9 / 60 °C		Dis. Pressure	0.249 MPaA	Pump Efficiency	86 %					
10	Relative Density at Normal Temp.	0.9937 (kg/m <sup>3</sup> )×1000		Suc. Pressure	0.015 MPaA	Shaft Power(Pump/Motor)	726/762 kW				△	
11	Vapour Press. at Normal Temp.	5.628 kPaA		Diff. Pressure	0.234 MPa	NPSH3 ( at Rated Flow )	5 m				△	
12	Viscosity at Normal Temp.	0.719 mPa·s		Total (at Rated Flow )	24 m	Min. Flow	6570 m <sup>3</sup> /h				△	
13	Ambient Temp.	35 °C		Head		Shut-Off Head	37.3 m				△	
14				NPSH av.	6.5 m	Rotation	CW ( viewed from Coupling side )					
15						POR	7300~10560 m <sup>3</sup> /h				△	
16						AOR	6570~10560 m <sup>3</sup> /h				△	
17	CONSTRUCTION						UTILITY					
18	Nozzle	( Size )	( Rating )	( Facing )	( Position )	To	Liquid	MPaG	L/min			
19	Connections	( Suction )	60" ASME B16.47 Class150 Series B	RF	Side	Mechanical Seal (Start-up only)	Geothermal Condensate	0.25	40		△	
20		( Discharge )	36" ASME B16.47 Class150 Series B	RF	Side						△	
21												
22	Serrated Surface on Dis. Flange	Yes										
23	Impeller	Closed Type Overhang Impeller										
24	No. of Stages	1										
25	Axial Thrust Adjusted by	Balancing Hole(Impeller)				DRIVER					△	
26	Casing ( Type / Mount / Split )	Diffuser / Barrel / Radial				Supplier	Torishima					
27	Pressure ( UNIT : MPaG )					Manufacturer	TMEIC				△	
28	Max Allowable Work'g Pres. (Pump-Barrel)	0.55 - Full Vacuum				Type	TEAAC				△	
29	Hydrotest Pressure (Pump-Barrel)	0.83 - 0.2				Output	830 kW	Poles	12			
30	Shaft Seal ( Type & Ex. Water )	Mechanical Seal / External Water Required (Start-up only)				Voltage	3300 V	Phase	3		△	
31	( Manuf. & Type ) (Q'ty)	TORISHIMA / Semi-Split (Non-API) / 1				Frequency	50 Hz	Insulation	F			
32						IP Grade	IP55				△	
33	Thrust Brg. ( Location / Type ) (Q'ty)	Pump / Roller Bearing / 1				Temperature Rise	B rise				△	
34	( Lubrication )	Oil Bath / Cooling Water Not Required				SPARE PARTS ( per all pumps )						
35						Refer to Spare parts list						
36						TOOLS ( per all pumps )						
37	Radial Brg. ( Type / Lubrication )	Rubber	/ Self			Special Tool	2	Set(s)		△		
38	( Number of Bearings )	2	( Shaft Enclosing Tubes )	Yes		APPROX. WEIGHT						
39	Driving Method	Direct				Pump	15900	kg				
40	Coupling Type	Flexible Coupling with Spacer				Barrel	3010	kg				
41	Baseplate	Barrel				Motor Stool	2960	kg		△		
42	Location of Nozzle ( Suc. / Dis. )	Above Floor / Above Floor				Sole Plate	1310	kg				
43	Vibration(at motor DE bearing )	3.5 (in preferred operating range) mm/s r.m.s.				Coupling	350	kg		△		
44	Noise Level	85 ( at 1m from equipment ) dB(A)				Motor	8800	kg		△		
45						Total	32330	kg		△		
46	MATERIALS											
47	( Part Name )	( MATERIAL )	( ASTM eq. )	( Part Name )	( MATERIAL )	( ASTM eq. )						
48	Impeller	SCS16A	A744 Grade CF3M	Riser Pipe (Body)	ASTM A240M Type 316L	-					△	
49	Diffuser Casing	SCS16A	A744 Grade CF3M	Riser Pipe (Flange)	ASME SA-182M F316L	-					△	
50	Shaft	SUS316L	A276 Type 316L	Bellmouth	SCS16A	A744 Grade CF3M						
51	Casing Wearing Ring	SUS316L	A240M Type 316L	Barrel(Body)	A240M Type 316L	-					△	
52	Impeller Wearing Ring	SUS316L	A240M Type 316L	Barrel(Lifting Hook)	A240M Type 316L	-					△	
53	Bearing Sleeve	SUS316L	A276 Type 316L	Barrel(Flange)	A36	-					△	
54	Discharge Bend (Body)	ASTM A240M Type 316L	-	Sole Plate	SS400	A36M					△	
55	Discharge Bend (Flange)	ASME SA-182M F316L	-	Bolt & Nut	SUS316L	A276 Type 316L					△	
56	Motor Stool	SS400	A36M								△	
57	ACCESSORIES ( per one pump )											
58	Foundation Bolt(For Pump)	16 Set(s)	VT	2 Pc(s)	Foundation Bolt(For Support)	16 Set(s)					△	
59	Sealing Water Unit	1 Set(s)	RTD	1 Pc(s)	Level Gauge	1 Pc(s)					△	
60	REMARKS											
61	2)For detailed material of construction refer to SECTIONAL DRAWING(Dwg. No.09100021509)											△
62	3)For instruments refer to P&ID (Dwg. No. 0920021590)											△
63	4)Corrosive and erosive agent is not applicable.											△
64												
Approved by		Checked by		Made by		Date		Dwg. No.		REV.		
K.Matsuda		I.Umeki		R.Ohga		17 Dec. 2017		Q4C0007357 -2/7		4		

 <p><b>Mitsubishi Corporation</b></p>	 <p><b>MITSUBISHI HITACHI POWER SYSTEMS</b></p>	 <p><b>H YOUNG &amp; CO. (EAST AFRICA) LTD.</b></p>		
<p>140MW Olkaria V GPPP Lot-II</p>				
<p>GENERAL ARRANGEMENT DRAWING</p>				
<p>SCALE <b>N. T. S.</b></p>		<p>DRAWING NO. <b>0910021550</b></p>	<p>REV. NO <b>5</b></p>	<p>SHEET NO <b>1/1</b></p>
<p>VENDOR</p> <div style="text-align: center;">  <p><b>TORISHIMA</b></p> </div>				







SPEC. – 830kW/490rpm	MAX. BORE	ø178
TYPE	SPTV900	WEIGHT 276 kgf/set
GD 2	16.4 kgf.m <sup>2</sup>	Q'TY 4 Sets

12	WENCH BOLT	M12x20	PURCH.	2	0.1
11	PLATE-B	ø194x20	S45C	1	4.5
10	PLATE-A	ø194x20	S45C	1	4.5
9	MIDDLE PLATE	ø240xø44.5	S45C	1	6.6

SURFACE TOUGHNESS	FRESH STATE		SURFACE TOUGHNESS
	Re	ReH	
0.5-3	40.1	40.1	△
3-6	40.1	40.1	△
6-30	40.2	40.2	△
30-120	40.3	40.3	△
120-400	40.5	40.5	△
400-1000	40.8	40.8	△
1000-2000	41.2	41.2	△
2000-4000	42	42	△

z/o Kgl/set	4	Sets

150 kgf.m

12	WENCH BOLT	M12x20	PURCH.	2	0.1
11	PLATE-B	ø194x20	S45C	1	4.5
10	PLATE-A	ø194x20	S45C	1	4.5
9	MIDDLE PLATE	ø240x44.5	S45C	1	6.6

TYPE	SPRINGS	WEIGHT
GD 2	16.4 kgf.m <sup>2</sup>	Q'TY

**NARA CORPORATION**

