



	
DOC NUMBER: <b>569-DB7B-MEC-711-005</b>		CLIENT NUMBER: <b>PRD-MEC-DSH-020</b>	
CLIENT: <b>TAKEDA</b>			
PROJECT: <b>BURITI EPCVM PROJECT</b>			

DATA SHEET  
 CENTRIFUGAL PUMP  
 CONDENSATION WATER PUMP  
 P-C-7B-1 / P-C-7B-2

0	30/JUL/2021	ISSUED FOR CONSTRUCTION	ASO	LUIS	RSP
B	16/JUN/2021	90% DD ISSUE	ASO	LUIS	RSP
A	08/FEB/2021	30% DD ISSUE	ASO	LUIS	MAJ
REV	DATE	DESCRIPTION	EXEC	CHECK	APPROV

 		 	
NUMBER: <b>569-DB7B-MEC-711-005</b>		CLIENT NR: <b>PRD-MEC-DSH-020</b>	
TITLE <b>CENTRIFUGAL PUMP - P-C-7B-1 / P-C-7B-2</b>			SHEET: <b>2/5</b> REV.: <b>0</b>

## 1. REVISION HISTORY

Rev	Reason For Change
A	ORIGINAL ISSUE
B	PAGE 3, line 2.2: changed from normal to design
	PAGE 3, line 2.3 to 2.12: added values for minimum and maximum conditions
	PAGE 3, line 2.3: changed operation flow from 207.0 m <sup>3</sup> /h to 260.0 m <sup>3</sup> /h for design condition
	PAGE 3, line 2.8: changed suction pressure from 0.05 barg to 0.026 barg for design condition
	PAGE 3, line 2.9: changed discharge pressure from 1.60 barg to 2.96 barg for design condition
	PAGE 3, line 2.10: changed differential pressure from 1.55 barg to 3.0 barg for design condition
	PAGE 3, line 2.11: changed total head from 16.0 mH <sub>2</sub> O to 31.0 mH <sub>2</sub> O for design condition
	PAGE 3, line 2.12: changed NPSH available from 10.75 mH <sub>2</sub> O to 10.28 mH <sub>2</sub> O for design condition
	PAGE 3: added note 4.
	PAGE 5, line 15.4: changed electrical motor protection from IPW to IP
	PAGE 5: Added note 6.
0	ISSUED FOR CONSTRUCTION

NUMBER: **569-DB7B-MEC-711-005**

 CLIENT NR: **PRD-MEC-DSH-020**

TITLE

**CENTRIFUGAL PUMP - P-C-7B-1 / P-C-7B-2**

 SHEET: **3/5**

 REV.: **0**

1	GENERAL				
1.1	ITEM N°:	P-C-7B-1 / 2		QUANTITY:	2
1.2	SERVICE:	CONDENSATION WATER - CHILLERS FOR PROCESS			
1.3	LOCAL:	DRUG SUBSTANCE BUILDING (7B)			
1.4	PUMP TYPE:	CENTRIFUGAL			
1.5	MANUFACTURER:	Note 1			
1.6	MODEL:	Note 1	MANUFACTURING STANDARD:		ASME B 73.1
1.7	APLICABLE:	PURPOSE			
1.8	DRIVING:	ELECTRIC MOTOR			
2	OPERATION CONDITIONS (note 1 / 4)				
2.1	FLUID:				
2.2			MINIMUM	DESIGN	MAXIMUM
2.3	OPERATION FLOW (m³/h):		228.9	260.0	228.9
2.4	DENSITY AT OPERATION TEMPERATURE (kg/m³):		995.3	995.3	995.3
2.5	OPERATION TEMPERATURE (°C):		31.5	31.5	31.5
2.6	VISCOSITY AT OPERATION TEMPERATURE (cP):		0.77	0.77	0.77
2.7	WATER VAPOUR PRESSURE AT OPERATION TEMP.(bar abs):		0.046	0.046	0.046
2.8	SUCTION PRESSURE (bar g):		0.070	0.026	0.070
2.9	DISCHARGE PRESSURE (bar g):		2.83	2.96	2.83
2.10	DIFFERENTIAL PRESSURE (bar):		2.8	3.0	2.8
2.11	TOTAL HEAD (mH2O):		28.93	31.0	28.93
2.12	NPSH AVAILABLE (mH2O):		10.69	10.28	10.69
2.13	OPERATION:	CONTINUOUS	CYCLE (h/day):	24 e 365	INSTALLATION: OUTDOOR
3.0	CONSTRUCTION				
3.1	IMPELLER (note 2):	CONSTRUCTION: TYPE: RADIAL		ARRAGEMENT: OVERHUNG TYPE: CLOSED	
3.2		STAGES: SIMPLE		QUANTITY: 1 SUCTION: SIMPLE	
3.3	BIPARTITE CASING (note 3):		RADIAL	SUPPORT: FOOT	VOLUTE: SIMPLE DIFFUSER: NO
3.4	CONNECTIONS:		DN	PN/CLASS	STANDARD NUMBER FACE
3.5	SUCTION:		note 1	150#	ASME/ANSI B16.5 RF
3.6	DISCHARGE:		note 1	150#	ASME/ANSI B16.5 RF
3.7	CASING DRAIN:		note 1	3000#	ASME/ANSI B1.20.1 (NPT) -
3.8	AUXILIARY CONNECTIONS:			TYPE:	PURGE PRES. INDICATOR TEMP. INDICATOR
3.9				SUPPLY	Yes No No
3.10				DN:	note1 - -
3.11	LUBRICATION BEARINGS: note 1				
4.0	PERFORMANCE (note 1)				
4.1	CURVE N°:		MAX. AMT ROTOR SELECTED (mm):		
4.2	REQUIRED NPSH (mcl):		BEST EFFICIENCY POINT (m³/h):		
4.3	EFFICIENCY (%):		MINIMUM STABLE FLOW (m³/h):		
4.4	BRAKE HORSEPOWER - BHP (kW/CV):		DIAMETER MÍN/SELEC./MÁX. (mm):		
4.5	MAX. POWER SELECTED IMPELLER (kW/CV):		SOUND PRESSURE (dB):		
4.6	ROTATION (RPM):		LOAD GD² (kg. M2):		
4.7	VIEW COUPLING ROTATION:				

**NOTES:**

- 1) To be filled by supplier.
- 2) The impeller must be dynamically and statically balanced.
- 3) Back Pull Out.
- 4) Pumps with a constant water flow.

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SHEET: **4/5**
**CENTRIFUGAL PUMP - P-C-7B-1 / P-C-7B-2**

REV.: **0**

<b>5</b>	<b>SEALING (Note 1)</b>		
<b>5.1</b>	<b>SHAFT SEALING:</b>	MECHANICAL SEAL	
<b>6</b>	<b>GASKET</b>		
<b>6.1</b>	<b>MATERIAL:</b>	N/A	
<b>6.2</b>	<b>MAX. TEMPERATURE (°C):</b>	N/A	
<b>6.3</b>	<b>MAX. PRESSURE CHAMBER (kgf/cm<sup>2</sup> / MPa):</b>	N/A	
<b>6.4</b>	<b>MAX. PERIPHERAL SPEED (m/s):</b>	N/A	
<b>7</b>	<b>MECHANICAL SEAL (note 2)</b>		
<b>7.1</b>	<b>SEALING PLAN:</b>		
<b>7.2</b>	<b>CONSTRUCTION STANDARD:</b>	ASME B73.1 or EN 12756 or similar	
<b>7.3</b>	<b>SEAL SIZE:</b>		
<b>7.4</b>	<b>CONSTRUCTION:</b>		
<b>7.5</b>	<b>TYPE:</b>		
<b>7.6</b>	<b>MODEL:</b>		
<b>7.7</b>	<b>MANUFACTURER:</b>		
<b>7.8</b>	<b>SUPPLY OF THE SEALING SYSTEM:</b>	PUMP MANUFACTURER	
<b>8</b>	<b>MATERIAL OF MECHANICAL SEAL (note 2)</b>		
<b>8.1</b>		<b>INTERNAL</b>	<b>EXTERNAL</b>
<b>8.2</b>	<b>ROTARY RING:</b>		
<b>8.3</b>	<b>STATIONARY RING:</b>		
<b>8.4</b>	<b>SECONDARY SEALING:</b>		
<b>8.5</b>	<b>SPRING / BELLOWS:</b>		
<b>8.6</b>	<b>BODY:</b>		
<b>9</b>	<b>COOLING (note 2)</b>		
<b>9.1</b>	<b>PLAN:</b>		
<b>9.2</b>	<b>FLOW (m<sup>3</sup>/h):</b>		
<b>9.3</b>	<b>PRESSURE (kgf/cm<sup>2</sup>):</b>		
<b>9.4</b>	<b>BEARINGS:</b>		
<b>9.5</b>	<b>OVERLAY:</b>		
<b>9.6</b>	<b>GASKET BOX:</b>		
<b>9.7</b>	<b>PEDESTAL:</b>		
<b>10</b>	<b>SEALING INJECTION (note 2)</b>		
<b>10.1</b>	<b>SEALING PLAN:</b>		
<b>10.2</b>	<b>FLOW (m<sup>3</sup>/h):</b>		
<b>10.3</b>	<b>PRESSURE (kgf/cm<sup>2</sup>):</b>		
<b>10.4</b>	<b>FLUID:</b>		
<b>10.5</b>	<b>FLUID TEMPERATURE (°C):</b>		
<b>11</b>	<b>AUXILIARY SEALING</b>		
<b>11.1</b>	<b>PLAN:</b>	N/A	
<b>11.2</b>	<b>FLOW (m<sup>3</sup>/h):</b>	N/A	
<b>11.3</b>	<b>PRESSURE (kgf/cm<sup>2</sup>):</b>	N/A	
<b>11.4</b>	<b>FLUID:</b>	N/A	
<b>11.5</b>	<b>FLUID TEMPERATURE (°C):</b>	N/A	
<b>12</b>	<b>HEATING</b>		
<b>12.1</b>	<b>HEATING SYSTEM:</b>	NOT REQUIRED	
<b>12.2</b>	<b>FLUID:</b>	N/A	

**NOTAS:**

1) The Supplier shall provide the Data Sheet for the Mechanical Seal and the Sealing System separately.

2) To be filled by supplier.

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TITLE

SHEET: 5/5

CENTRIFUGAL PUMP - P-C-7B-1 / P-C-7B-2

REV.: 0

13	COUPLING (note 4)			
13.1	MODEL:	note 1		
13.2	TYPE:	FLEXIBLE		
13.3	SIZE:	note 1		
13.4	DISPLACEMENT (mm):	5,0		
13.5	MANUFACTURER:	note 1		
14	MATERIALS			
14.1	CASING:	A48CL 30B OU SIMILAR		
14.2	IMPELLER:	A48CL 30B OU SIMILAR		
14.3	SHAFT:	SAE 1045		
14.4	SHAFT SLEEVE:	AISI 316		
14.5	LANTERN RING:	N/A		
14.6	METALLIC BASE:	ASTM A36		
14.7	COUPLING PROTECTION:	BRASS		
14.8	CASE WEAR RING:	AISI 316		
14.9	IMPELLER WEAR RING:	AISI 316		
14.10	AUXILIARY PIPING:	AISI 316		
14.11	NAMEPLATE:	AISI 304		
15	DRIVER 2) 3)			
15.1	TYPE:	ELECTRIC MOTOR (TFVE)	INSULATION CLASS:	F
15.2	POWER (CV):	note 1	SERVICE FACTOR:	1.25
15.3	ROTATION (RPM):	1800	ZONE / TEMP. CLASS / GROUP:	N/A
15.4	TENSION (V)	220/380/440	PROTECTION:	IP 55
15.5	N° OF PHASES :	3	CONSTRUCTIVE FORM / ASSEMBLY:	B3D
15.6	FREQUENCY (Hz):	60	MANUFACTURER:	ACCORDING TO VENDOR LIST
15.7	SPEED CONTROL:	Yes (note 6)	SCOPE:	PUMP MANUFACTURER
17	TESTS			
17.1	HIDROSTATIC:	CERTIFIED		
17.2	PERFORMANCE:	CERTIFIED		
17.3	MECHANICAL OPERATION:	CERTIFIED		
17.4	NPSH:	CERTIFIED		
17.5	DISASSEMBLY AFTER TEST:	CERTIFIED		
17.6	HIDROSTATIC TEST PRESSURE (bar g):	note 1		
17.7	CASING DESIGN PRESSURE (bar g):	note 1		
18	WEIGHTS			
18.1	PUMP (kg):	note 1	DRIVER (kg):	note 1
18.2	COUPLING (kg):	note 1	BASE (kg):	note 1
18.3	COUPLING PROTECTION (kg):	note 1	TOTAL (kg):	note 1
19	PAINTING			
19.1	SPECIFICATION:	note 1		
19.2	SCHEME:	note 1		

**NOTAS:**

1) To be filled by supplier.

2) The Supplier shall provide the Data Sheet for Electric Motor separately.

3) The motor must be dimensioned to meet the demand corresponding to all operating points of the characteristic curve, referring to the selected impeller.

4) The coupling protection must comply with NR-12.

5) Reference document: PRD-MEC-TSP-005 (TECHNICAL SPECIFICATION – WATER PUMPS)

6) The electric motor has a frequency inverter to enable balancing and ramp start. The frequency inverter shall be supplied with communication protocol in Ethernet and compatible with the Wonderware platform (BMS System).