

Seal Application Order / Enquiry Form (SAF)

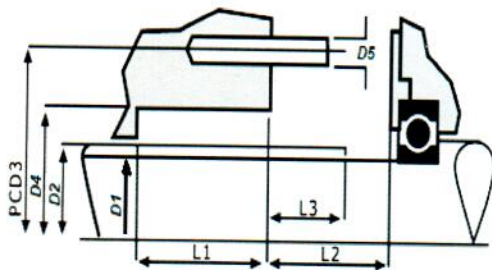
SECTION 1: Customer Details

Pos: 303-P301AB

API information required (Mandatory)

End User	Petrotel-Lukoil S.A.	Location:	Onshore-outdoor			
Industry sector	Refinery	Ambient temperature:	min -35°C			max +45°C
Location	Ploiesti, Prahova-Romania	Position:	Horizontal		x	Vertical
Area of Plant *	Sulfur recovery unit 3	Direction of rotation:	CCW		x	CW
Pump Duty *	Withdrawal					
Company:	PETROTEL-LUKOIL S.A.	Phone no:	+40-766257243			
Engineer:	IORGOIU CIPRIAN	Email:	ciorgoiu@petrotel.lukoil.com			

SECTION 2: Seal Dimensional & Type Details

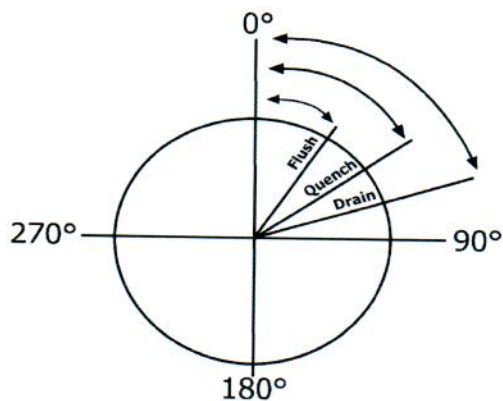
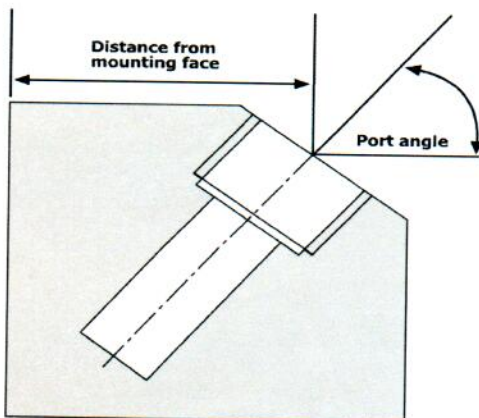


	Value	Units
D1 (Shaft OD):	Ø30 F7/g6	mm
D2 (Sleeve OD):	-	mm
PCD3 (Bolt Circle Dia):	Ø115	mm
D4 (Pilot Bore):	Ø80 H7/f7	mm
D5 (Bolt Size):	M12	mm
L1 (Chamber Dept):	75	mm
L2 (Dist First Obstr.):		mm
L3 (Dist Sleeve Outside):	-	mm
	-	mm
Bolt No:	4	buc
Bolt Pattern:	Threaded whole length	

Is the shaft harder than AISI 316L (160 HB)?

If yes state value or material spec:

Seal type	component seal		dual seal face to face			semi cartridge
	single seal	x	dual seal tandem			throttle bushing
	dual seal back to back		cartridge	x		



[Handwritten signature]

Port Orientation (viewed from motor end)

	Port 1	Port 2	Port 3	Port 4	Port 5
Port Function*:	F	Q	D		-
Axial distance from mounting face:	17 mm	43 mm	43 mm		-
Size and thread e.g. 1/2" NPT:	1/2" NPT	3/8" NPT	3/8" NPT		-
Angle/Ports angle:	0°/0°	0°/0°	180°/0°		-

* F = Flush, BI = Barrier In, BO = Barrier Out, QI = Quench In, QO = Quench Out, V = Vent

SECTION 3: Pump Details

Manufacturer:	Sundyne - Bombas Ercole Marelli	Size / Type:	VSMKD1-1/2x3x8-1/4
Serial No:	N12977 / N12978	Shaft Speed (rpm):	3000 rpm
Tag Number:	303-P301AB	Axial Movement* (max):	-
Radial Movement* (max):	-	S'Box Recess Dia*:	-
Discharge Pressure*:	3,8 bara	API Plan No:	02+62
Suction Pressure*:	0,3 bara		
API Pump Designation:	VS4		
Seal Type:	TOP		
Pump Design Type:	API		
Pump Modifications:	NO		

e.g. BB3

e.g. Top, Bottom, Side

e.g. ISO, DIN, ANSI, API, Other

Yes or No, if Yes give details

* Please state units, e.g. psia, psig, barg, inches, mm

SECTION 4: Product Details

Product:	LIQUID SULF	Chemical Composition / Concentration:	H2S 300 ppm
Hazardous: e.g. Flammable, Toxic, Explosive	FLAMMABLE, TOXIC	pH APT*:	NA
Flush Fluid:	NA	Specific Gravity APT*:	2070 kg/m3
Temperature:	120 ° C	Polymerising:	NO Yes or No
Vapour Pressure APT*:	0,00014 Pa	Dissolved Contaminant:	NO Yes or No
Viscosity APT*:	min - max / 8-40 cP	Abrasive Content:	Yes Yes or No
Pressure in S'Box:	NA	Flush Available:	YES Yes or No
Max. Particle Size:	NA	Dry Running:	NO Yes or No

*APT = At Pumping Temperature

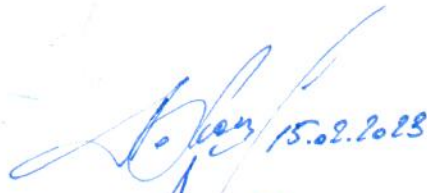
Buffer/Barrier Liq. Type or Name:	-	Flush Liq. Type or Name:	-
Specific Gravity:	-	Specific Gravity:	-
Viscosity:	-	Viscosity:	-
Barrier/Buffer Pressure:	-	Barrier/Buffer Pressure:	-
Temperature:	-	Temperature:	-

SECTION 5: Customer Seal Suggestions

Size:	-
Type:	-
Ports:	-
O Ring Material(s):	-
Seal Plans (API):	-
Other Specification (e.g. API, ATEX):	API, ATEX
Quantity:	1
Price:	-
Delivery:	DDP Ploiesti

Remarks:	

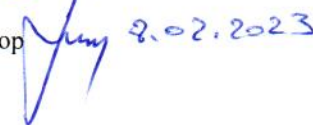
Head Mechanical Engineer

 15.02.2023

Senior Mechanical Specialist Engineer

 14.02.22

Repair Specialist in the Workshop

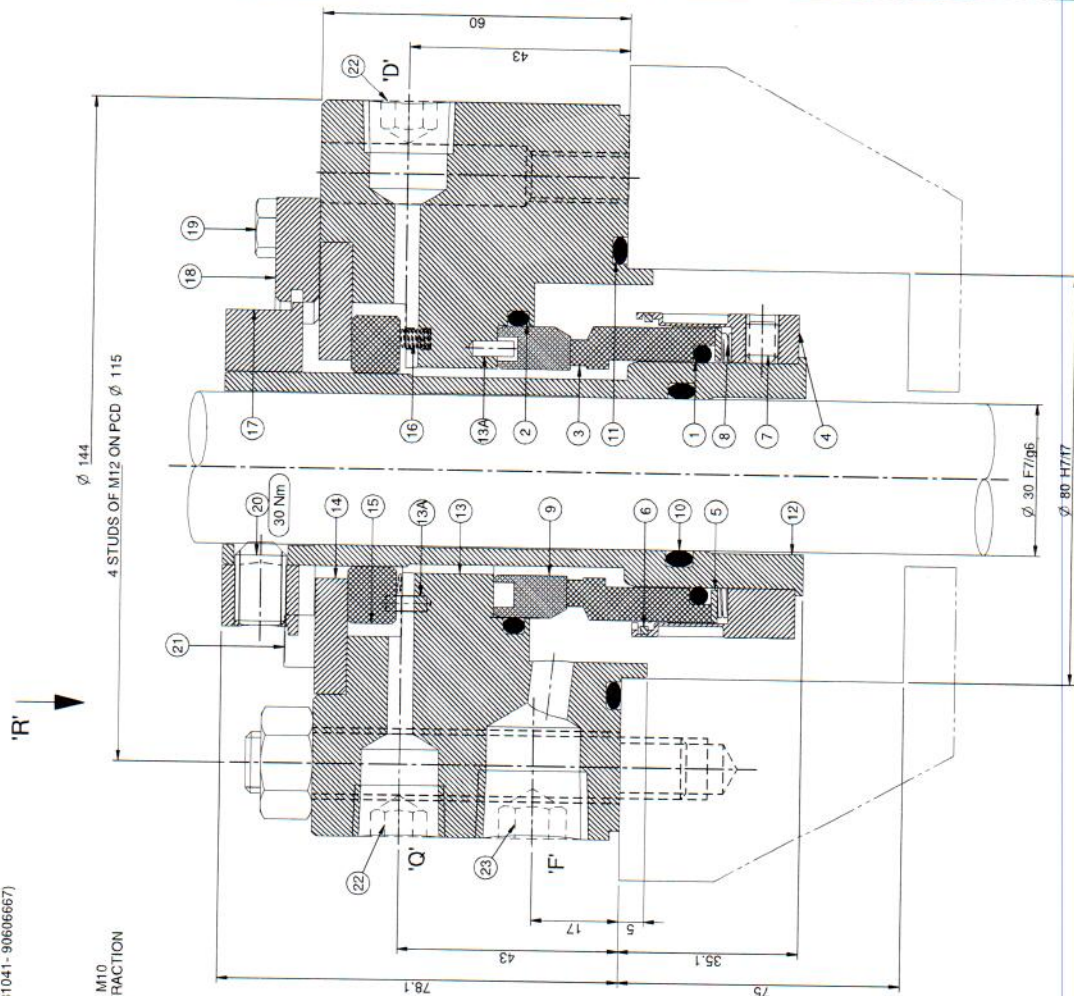
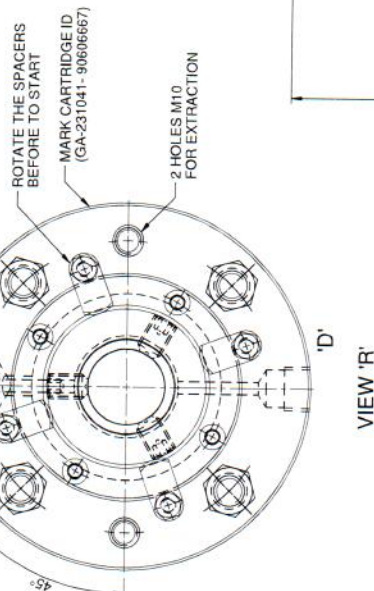
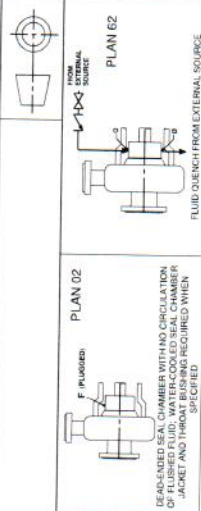
 2.02.2023

Chief Unit



Mechanical engineer

Ing. Mecanic
Bălăceanu Constantin
 30. IAN. 2023



Note: The pipe plug label as a document number per clause 3.7.3 in IS-1021 is to be included along with the seal.

Note: SUPPLY PIPE PLUG KIT PER IS-1021



CONNECTIONS		
F	FLUSH (PLUGGED)	1/2" N.P.T.
D	DRAIN	3/8" N.P.T.
Q	QUENCH	3/8" N.P.T.

Material (if applicable)	1/2" NP T.	3/8" NP T.	3/8" NP T.
DRAN			
QUENCH			

Notes:
Refer to John Crane seal and installation instructions for recommended practice

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Item	Drawing Number	Mail Code	Description	Material	Qty	Spare
1	0000224	9579	O-RING	LT-FFKM	1	X
2	0000228	9579	O-RING	LT-FFKM	1	X
3	C48-1750-001	7250	PRIMARY RING	CARBON	1	X
4	A9-1750-050	0550	RETAINER	316 S.S.	1	
5	A9-1750-053	0550	THRUST RING	316 S.S.	1	
6	A9-1812-022	0550	SNAP RING	316 S.S.	1	
7	11252005000	0550	SET SCREW	316 S.S.	4	X
8	0707		SPRING	HASTELLOY 'C'	8	X
9	TAB-2033-0381	1903	MATING RING	SILICON CARBIDE	1	X
10	0000218	9579	O-RING	LT-FFKM	1	X
11	0000237	9579	O-RING	LT-FFKM	1	X
12	H-0300M-3335	0550	SLEEVE	316 S.S.	1	
13	H-0300M-3336	0550	GLAND PLATE ASSEMBLY	316 S.S.	★★	
14	TAB-1103-0381	0550	AUXILIARY GLAND	316 S.S.	1	
15	H-1501-153	9080	FLOATING BUSH	CARBON	1	
16	3787		SPRING	HASTELLOY 'C'	3	X
17	TAB-3370-0444	0550	DRIVE COLLAR	316 S.S.	1	
18	H-0000-5549	0570	SPACER	316 S.S. SINTERED	4	
19	72061000020	0550	HEX. HEAD SCREW	316 S.S.	4	X
20	61101500016	0649	SET SCREW	S.S.	3	X
21	71061000020	0225	CAP HEAD SCREW	ALLOY STEEL	4	X
22	0300-022/001		PLUG	316 S.S.	2	
23	0400-022/001		PLUG	316 S.S.	1	
FOR REFERENCE ONLY (NOT TO BE ORDERED)						
13	GLAND PLATE ASSEMBLY CONSIST OF					
13A	31060008102	0550	IPN	316 S.S.	2	

"SEAL MEETS JC API STANDARD IS-682-1"

SOLIDS / CONTAMINANTS NAME : (10-300 PPM H2S)

SEAL ASSY NO.	ASSEMBLY	BILL OF MATERIALS NUMBER
N : A48-1750-001 (4M P)	SEAL HEAD	03001648--GA231041 (90606667)
OUT:	SPARES KIT	
	DESCRIPTION	ITEMS
EQUIPMENT REFERENCE		
ITEM:	SEAL DATA	
ERCOLE MARELLI	APL CODE:	
EQUIPMENT TYPE	02/62	21A-LIN-030-02/62
VERTICAL PUMP	INSTRUCTION MANUAL REF.	
MODEL FRAME / SIZE	MATERIAL CODE	
/SMKD 1 1/2X3X8 1/4	X48 P15 X 148 D81 H 316HC	
SERIAL / DRAWING NO.		
CUSTOMER INFORMATION		
CUSTOMER:	FLUID:	SERVICE DATA
ERCOLE MARELLI	SULFUR	
ORDER NO.	BARRIER FLUID:	
075298		
NO USE		
C. PETROTEL - LUKOIL S.A.	CHAMBER PRESSURE:	1.16 NORM / 1.26 MAX BARA
POA TITANO	SUCTION PRESSURE:	0.20 NORM / 0.30 MAX BARA
ANIT	DISCHARGE PRESSURE:	3.30 NORM / 3.80 MAX BARA
SULFUR RECOVERY UNIT 3	PROCESS TEMPERATURE:	
REFERENCE DATA 00013464	SHMFT SPEED:	150 NORM / 150 MAX °C
	2800 RPM	VAPOUR PRESSURE:
		VISCOUSITY:
		SPECIFIC GRAVITY:
		40 cP
		DE / NDE DRG NO:
EAL SIZE: Ø1.750"		
EAL TYPE: 1648 SINGLE CARTRIDGE		

GA-231041-1

MECHANICAL DATASHEET FOR P-301A/B

REV	DATE	REASON FOR ISSUE	PREPARED BY	CHECKED BY	APPROVED BY	PROJECT APPROVAL
DOCUMENT TYPE		Data sheet		SEQUENCE NO	STANDARD SIZE OF DOC	REV

MECHANICAL DATA SHEET

(API 610 ELEVENTH EDITION, 2010 / ISO 13709 :2009 CENTRIFUGAL PUMPS)


Sundyne
 Bombas Ercole Marelli S.r.l.

1	Note	APPLICABLE TO: PURCHASE	APPLICABLE NTL/INTNL STANDARD: API-610	PUMP TAG: P-301A/B	Rev
2	REFERENCE	SONNEK ORDER 3643	PROJECT	Construction of Sulfur Pump	
3	CUSTOMER	S.C. PETROTEL - LUKOIL S.A.	SERVICE	Liquid sulfur Pump	
2	NO. REQ	2	PUMP SIZE	VSMKD 115x3x8%	
3	MANUFACTURER	BOMBAS ERCOLE MARELLI	MODEL	VSMKD	
4			SERIAL NO.	N12977 / N12978	
5	LIQUID CHARACTERISTICS				
6	LIQUID TYPE OR NAME :	Units	Maximum	Minimum	Note
7	VAPOR PRESSURE :	bar a	negl.		
8	DENSITY :	kg/m3	1790		
9	SPECIFIC HEAT :	kJ/(kg-K)	-		
10	VISCOSITY :	cP	40	8	
11	OPERATING CONDITIONS (6.1.2)				
12		Units	Maximum	Rated	Normal
13	NPSHa Datum:			C.L. Impeller	
14	PUMPING TEMPERATURE :	°C	150	145	
15	FLOW :	m³/h		35	
16	DISCHARGE PRESSURE : (6.3.2)	bar a	3,8	3,5	
17	SUCTION PRESSURE :	bar a	0,3	0,2	
18	DIFFERENTIAL PRESSURE :	bar		3,3	
19	DIFFERENTIAL HEAD :	m		20-3,8	
20	NPSH _r :	m		5	
21	HYDRAULIC POWER :	kW			
22	SITE AND UTILITY DATA				
23	LOCATION:	OUTDOOR			
24	MOUNTED AT :				
25	ELECTRIC AREA CLASSIFICATION:	6.1.22	Zone 1, Group IIC, Temp. Class T3		
26	SITE DATA :				
27	ELEVATION (MSL) :	m	BAROMETER :	750,0	mmHg
28	RANGE OF AMBIENT TEMPS: MIN / MAX		-28	41	°C
29	RELATIVE HUMIDITY: MIN / MAX		66	99	%
30	UNUSUAL CONDITIONS:				
31	UTILITY CONDITIONS :				
32	ELECTRICITY :	DRIVERS	HEATING	CONTROL	SHUTDOWN
33	VOLTAGE	400	230		
34	PHASE	3	1		
35	HERTZ	50	50		
36	COOLING WATER :				
37	TEMP °C	INLET	RETURN	DESIGN	
38	PRESS. bar g	MAX	MIN		
39	SOURCE				
40	COOLING WATER CHLORIDE CONCENTRATION:	ppm			
41	INSTRUMENT AIR :	MAX	bar	MIN	
42	STEAM				
43	TEMP °C	Max	Min	DRIVERS	HEATING
44	PRESS. bar g	Max	Min		
45				180	
46				152	
47				6	
48				3,5	
49	PERFORMANCE				
50	PROPOSAL CURVE NO.	0081.17.4	RPM	2900	
51	As Tested Curve No.				
52	IMPELLER DIA.:	RATED 178	MAX. 209	MIN. 170	mm
53	RATED POWER	7,84	EFFICIENCY	51,9	(%)
54	RATED CURVE BEP FLOW (at rated impeller dia)			34,5	m³/h
55	MIN FLOW :	THERMAL m³/hr	STABLE	13	m³/h
56	PREFERRED OPERATING REGION (6.1.11)		24,15	41,4	m³/h
57	ALLOWABLE OPERATING REGION		13	41,4	m³/h
58	MAX HEAD @ RATED IMPELLER			32	m
59	MAX POWER @ RATED IMPELLER	(6.8.9)		7,9	kW
60	NPSH ₃ AT RATED FLOW :			2,3	m
61	CL PUMP TO U/S BASEPLATE			-	m
62	NPSH MARGIN AT RATED FLOW :			2,70	m
63	SPECIFIC SPEED (6.1.9)		m³/h, rpm, m	700	
64	SUCTION SPECIFIC SPEED LIMIT		m³/h, rpm, m		
65	SUCTION SPECIFIC SPEED		m³/h, rpm, m	5200	
66	MAX. ALLOW. SOUND PRESS. LEVEL REQD (6.1.14)				(dBA)
67	EST MAX SOUND PRESS. LEVEL			85	(dBA)
68	MAX. SOUND POWER LEVEL REQD (6.1.14)				
69	EST MAX SOUND POWER LEVEL				
70	IMPELLER TIP SPEED				m/s
71	DRIVER (7.1.5)				
72	Driver Type	MOTOR			
73	GEAR	NO			
74	VARIABLE SPEED REQUIRED	NO			
75	SOURCE OF VARIABLE SPEED				
76	ELECTRIC AREA CLASSIFICATION	Exde IIC T3			
77	MANUFACTURER	ABB			
78	NAMEPLATE POWER	11 kW			
79	Nominal RPM	2900			
80	RATED LOAD RPM				
81	FRAME OR MODEL	160			
82	ORIENTATION	VERTICAL			
83	LUBE	GREASE			
84	BEARING TYPE:				
85	RADIAL	BALLS			
86	THRUST	BALLS			
87	STARTING METHOD				
88	SEE DRIVER DATA SHEET				
89	MOTOR TAG :				

(API 610 ELEVENTH EDITION, 2010 / ISO 13709 :2009 CENTRIFUGAL PUMPS)



1	Note	CONSTRUCTION	Rev
2	API PUMP TYPE: VS4 [Based on API 610 definitions]	CASING MOUNTING: RECTANGULAR SOLEPLATE	
3	SEE ALSO PAGE 6	CASING TYPE: (6.3.10)	
4	NOZZLE CONNECTIONS: (6.5.5)	OH3 BACKPULLOUT LIFTING DEVICE REQD. (9.1.2.6)	N / A
5		CASE PRESSURE RATING:	
6	SUCTION	MAWP : (6.3.6)	7,0 bar g @ 250 °C
7	DISCHARGE	HYDROTEST : (8.3.2.2)	16,0 bar g @ AMB °C
8	PRESSURE CASING AUX. CONNECTIONS:		
9		HYDROTEST OH PUMP AS ASSEMBLY	YES
10	BALANCE/LEAK OFF	SUCTN PRESS. REGIONS DESIGNED FOR MAWP	YES
11	DRAIN	ROTATION: (VIEWED FROM COUPLING END)	CW
12	VENT	• IMPELLERS INDIVIDUALLY SECURED :	YES
13	PRESSURE GAGE	• BOLT OH 3/4/5 PUMP TO PAD / FOUNDATION :	N / A
14	TEMP GAGE	• PROVIDE SOLEPLATE FOR OH 3/4/5 PUMPS	N / A
15	WARM-UP LINE	ROTOR:	
16		SHAFT FLEXIBILITY INDEX (SFI) (9.1.1.3)	
17	Drain Valve Supplied By	First Critical Speed Wet (Multi stage pumps only)	
18	DRAINS MANIFOLDED	COMPONENT BALANCE TO ISO 1940 G2.5	YES
19	VENT Valve Supplied By	SHRINK FIT -LIMITED MOVEMENT IMPELLERS (9.2.2.3)	
20	VENTS MANIFOLDED		
21	THREADED CONS FOR PIPELINE SERVICE < 50° C (6.4.3.2)	COUPLING:(7.2.3) (7.2.13.f)	
22	SPECIAL FITTINGS FOR TRANSITIONING (6.4.3.3)	MANUFACTURER	METASTREAM
23	CYLINDRICAL THREADS REQUIRED (6.4.3.8)	MODEL	TDKS
24	GUSSET SUPPORT REQUIRED	RATING (POWER/100 RPM)	1,4
25	MACHINED AND STUDDED CONNECTIONS (6.4.3.12)	SPACER LENGTH	180 mm
26	VS 6 DRAIN	SERVICE FACTOR	>1,5
27	DRAIN TO SKID EDGE	RIGID	NO
28		COUPLING WITH HYDRAULIC FIT (7.2.10)	
29	MATERIAL (6.12.1.1)	COUPLING BALANCED TO ISO 1940-1 G6.3 (7.2.3)	YES
30	APPENDIX H CLASS A-8	COUPLING WITH PROPRIETARY CLAMPING DEVICE (7.2.11)	
31	MIN DESIGN METAL TEMP (6.12.4.1) -28 °C	COUPLING IN COMPLIANCE WITH (7.2.4)	In compliance with API 610 latest edition
32	REDUCED-HARDNESS MATERIALS REQD (6.12.1.12.1)	COUPLING GUARD STANDARD PER (7.2.13.a)	
33	Applicable Hardness Standard (6.12.1.12.3): NACE MR 0175	Window on Coupling Guard	NO
34	BARREL :		
35	BOWL :		
36	DIFFUSERS		
37	IMPELLER :		
38	IMPELLER WEAR RING :		
39	CASE WEAR RING :		
40	SHAFT:		
41	Bowl (if VS-type)		
42	Inspection Class		
43			
44	BEARINGS AND LUBRICATION (6.10.1.1)		
45	BEARING (TYPE / NUMBER): (6.11.4)		
46	RADIAL SLEEVES / SLEEVES		
47	THRUST BALL / SKF 7312 BECBM		
48	REVIEW AND APPROVE THRUST BEARING SIZE : (9.2.5.2.4)		
49			
50	LUBRICATION : (6.10.2.2) (6.11.3) (9.6.1) RING OIL		
51	PRESSURE LUBE SYSTEM TO ISO 10438- (9.2.6.5)		
52	ISO 10438 DATA SHEETS ATTACHED		
53	Pressurized Lube Oil System mtd on pump baseplate		
54	Location of Pressurized Lube Oil System mounted on baseplate :		
55			
56	INTERCONNECTING PIPING PROVIDED BY		
57			
58	OIL VISC. ISO GRADE VG 68		
59	CONSTANT LEVEL OILER :		
60			

MECHANICAL DATA SHEET

(API 610 ELEVENTH EDITION, 2010 / ISO 13709 :2009 CENTRIFUGAL PUMPS)



Bombas Ercole Marelli S.r.l.

Rev A

1	Note	INSTRUMENTATION	SEAL SUPPORT SYSTEM MOUNTING	Rev
2		SEE ATTACHED API-670 DATA SHEET	SEAL SUPPORT SYSTEM MOUNTED ON PUMP BASEPLATE	
3		ACCELEROMETER (7.4.2.1)	(7.5.1.4)	
4		Number of Accelerometers	IDENTIFY LOCATION ON BASEPLATE	
5		Mounting Location of Accelerometers	INTERCONNECTING PIPING BY	
6				
7		PROVISION FOR MTG ONLY (6.10.2.10)		
8		Number of Accelerometers		
9		Mounting Location of Accelerometers		
10				
11		FLAT SURFACE REQUIRED (6.10.2.11)		
12		Number of Accelerometers		
13		Mounting Location of Accelerometers		
14				
15		VIBRATION PROBES (7.4.2.2)		
16		PROVISIONS FOR VIB. PROBES		
17		NUMBER PER RADIAL BEARING		
18		NUMBER PER AXIAL BEARING		
19				
20		MONITORS AND CABLES SUPPLIED BY (7.4.2.4)		
21				
22		TEMPERATURE (7.4.2.3)		
23		PROVISIONS FOR TEMP PROBES		
24		RADIAL BEARING TEMP.		
25		NUMBER PER RADIAL BEARING		
26		THRUST BEARING TEMP.		
27		NUMBER PER THRUST BEARING ACTIVE SIDE		
28		NUMBER PER THRUST BEARING INACTIVE SIDE		
29		TEMP. GAUGES (WITH THERMOWELLS) (9.1.3.6)		
30		PRESSURE GAUGE TYPE		
31		Remarks		
32				
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MECHANICAL DATA SHEET

(API 610 ELEVENTH EDITION, 2010 / ISO 13709 :2009 CENTRIFUGAL PUMPS)



1	Note	SURFACE PREPARATION AND PAINT					TEST					Rev
2	MANUFACTURER'S STANDARD	YES					SHOP INSPECTION (8.1.1)					Yes
3	OTHER (SEE BELOW)						PERFORMANCE CURVE					
4	SPECIFICATION NO.	PTT-002					& DATA APPROVAL PRIOR TO SHIPMENT.					
5							TEST WITH SUBSTITUTE SEAL (8.3.3.2.b)					
6	PUMP:						MATERIAL CERTIFICATION REQUIRED					
7	PUMP SURFACE PREPARATION						(6.12.1.8) CASING					YES
8	PRIMER						IMPELLER					YES
9	FINISH COAT						SHAFT					YES
10							OTHER					NO
11	BASEPLATE:						CASTING REPAIR WELD PROCEDURE APPR REQD					
12	BASEPLATE SURFACE PREPARATION						(6.12.2.5) (6.12.3.1)					
13	PRIMER:						INSPECTION REQUIRED FOR CONNECTION WELDS (6.12.3.4.d)					
14	FINISH COAT						MAG PARTICLE					
15	DETAILS OF LIFTING DEVICES						RADIOGRAPHY					
16							LIQUID PENETRANT					
17	SHIPMENT: (8.4.1)						ULTRASONIC					
18	EXPORT BOXING REQUIRED						INSPECTION REQUIRED FOR CASTINGS					
19	OUTDOOR STORAGE MORE THAN 6 MONTHS						MAG PARTICLE					
20							RADIOGRAPHY					
21	SPARE ROTOR ASSEMBLY PACKAGED FOR:						LIQUID PENETRANT					YES
22	ROTOR STORAGE ORIENTATION (9.2.8.2)						ULTRASONIC					
23	SHIPPING & STORAGE CONTAINER FOR VERT STORAGE (9.2.8.3)						HARDNESS TEST REQUIRED (8.2.2.7)					
24							ADDNL SUBSURFACE EXAMINATION (6.12.1.5) (8.2.1.3)					
25	N2 PURGE (9.2.8.4)						FOR					
26	SPARE PARTS						METHOD					
27	START-UP						PMI TESTING REQUIRED (8.2.2.8)					NO
28	NORMAL MAINTENANCE						COMPONENTS TO BE TESTED					
29							RESIDUAL UNBALANCE TEST (J.4.1.2)					
30							NOTIFICATION OF SUCCESSFUL SHOP					
31							PERFORMANCE TEST (8.1.1.c) (8.3.3.5)					
32	ITEM No	PUMP	DRIVER	GEAR	BASE	TOTAL	BASEPLATE TEST (7.3.21)					
33	304-P3A/B						HYDROSTATIC					NON WITNESSED
34							HYDROSTATIC TEST OF BOWLS & COLUMN (9.3.13.2)					
35							PERFORMANCE TEST					WITNESSED
36							TEST IN COMPLIANCE WITH (8.3.3.2)					
37	COORDINATION MEETING REQUIRED (10.1.3)	NO					TEST DATA POINTS TO (8.3.3.3)					
38	MAXIMUM DISCHARGE PRESSURE TO INCLUDE						TEST TOLERANCES TO (8.3.3.4)					
39	MAX RELATIVE DENSITY	YES					NPSH (8.3.4.3.1) (8.3.4.3.4)					
40	OPERATION TO TRIP SPEED	YES					NPSH-1ST STG ONLY (8.3.4.3.2)					
41	MAX DIA. IMPELLERS AND/OR NO OF STAGES	YES					NPSH TESTING TO HI 1.6 OR ISO 9906 (8.3.4.3.3)					
42	CONNECTION DESIGN APPROVAL (9.2.1.4)	YES					TEST NPSHA LIMITED TO 110% SITE NPSHA (8.3.3.6)					
43	TORSIONAL ANALYSIS / REPORT (6.9.2.10)	NO					RETEST ON SEAL LEAKAGE (8.3.3.2.d)					
44	PROGRESS REPORTS	YES					RETEST REQUIRED AFTER FINAL HEAD ADJ (8.3.3.7.b)					
45	OUTLINE OF PROC FOR OPTIONAL TESTS (10.2.5)	NO					COMPLETE UNIT TEST (8.3.4.4.1)					
46	ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (8.2.1.1)	NO					SOUND LEVEL TEST (8.3.4.5)					
47							CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)					
48	LATERAL ANALYSIS REQUIRED (9.1.3.4) (9.2.4.1.3)	NO					LOCATION OF CLEANLINESS INSPECTION					
49	MODEL ANALYSIS REQUIRED (9.3.9.2)	NO					NOZZLE LOAD TEST					
50	DYNAMIC BALANCE ROTOR (6.9.4.4)	YES					CHECK FOR CO-PLANAR MOUNTING PAD SURFACES					
51	INSTALLATION LIST IN PROPOSAL (10.2.3.1)	YES					MECHANICAL RUN TEST UNTIL OIL TEMP STABLE					
52	VFD STEADY STATE DAMPED RESPONSE ANALYSIS (6.9.2.3)						4 HR. MECH RUN AFTER OIL TEMP STABLE (8.3.4.2.1)					
53							4 HR. MECH RUN TEST (8.3.4.2.2)					
54	TRANSIENT TORSIONAL RESPONSE (6.9.2.4)	NO					BRG HSG RESONANCE TEST (8.3.4.7)					
55	BEARING LIFE CALCULATIONS REQUIRED (6.10.1.6)	NO					STRUCTURAL RESONANCE TEST (9.3.9.2)					
56	IGNITION HAZARD ASSMT TO EN 13463-1 (7.2.13.e)	NO					REMOVE / INSPECT HYDRODYNAMIC BEARINGS AFTER TEST					
57	CASING RETIREMENT THICKNESS DRAWING (10.3.2.3)	NO					(9.2.7.5)					
58	FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.2.8)	NO					AUXILIARY EQUIPMENT TEST (8.3.4.6)					
59	INCLUDE PLOTTED VIBRATION SPECTRA (6.9.3.3)	YES					EQUIPMENT TO BE INCLUDED IN AUXILIARY TESTS					
60	CONNECTION BOLTING (7.5.1.7)						LOCATION OF AUXILIARY EQUIPMENT TEST					
61	CADMIUM PLATED BOLTS PROHIBITED	YES					IMPACT TEST (6.12.4.3)					PER EN 13445
62	VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)	YES					PER ASME SECTION VIII					
63	VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)	YES					REMOVE CASING AFTER TEST					
64	SUBMIT INSPECTION CHECK LIST (8.1.5)	YES										
65	POST TEST INSPECTION OF COMPONENTS	NO										
66												
67												
68												