

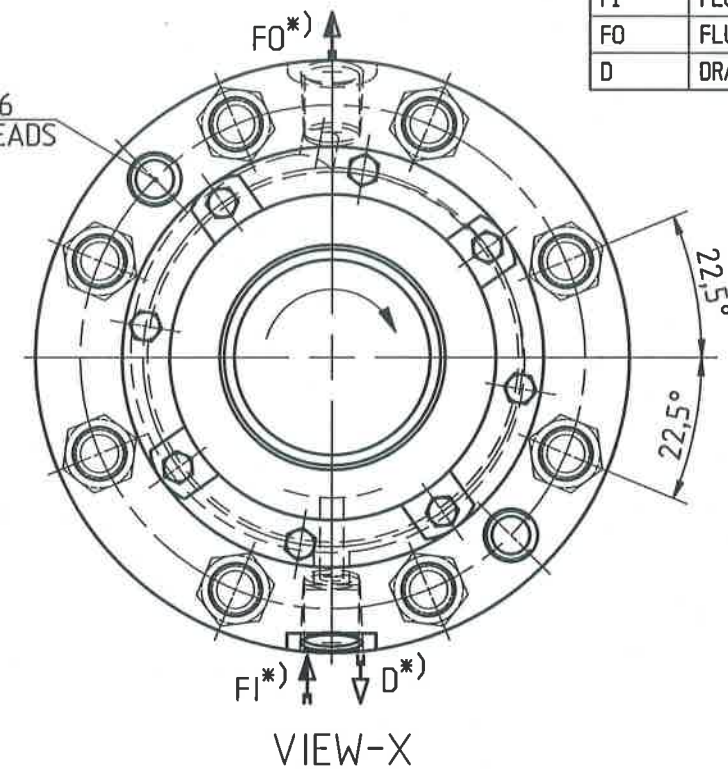
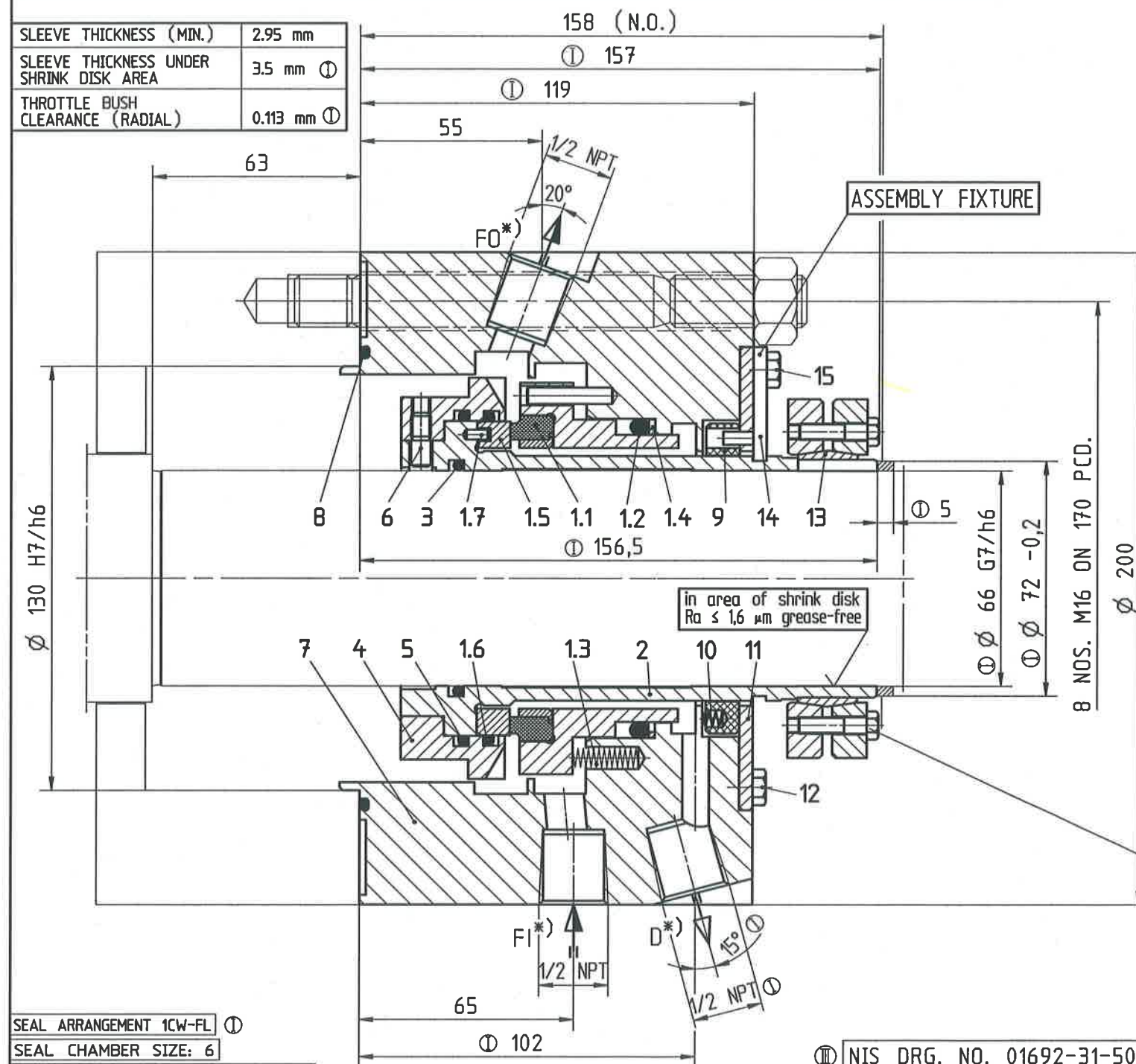
Project No : (JE/HPC/NIS) 44NC5100/EF09029/1692NP Project Location : NIS Refinery, Serbia Owner : Naftna Industrija Srbije Client : Heurtey Petrochem SA				Project Title : Pancevo Oil Refinery Modernization Project, 77,000 Nm3/hr, Hydrogen Generation Unit. Mechanical Seal Drawing Tag no. GA -5002 A/B				DOCUMENT NO. 01692-31-50-9045																										
THIS TITLE SHEET IS THE FIRST PAGE OF THE SPECIFICATION AND IS A RECORD OF EACH ISSUE OR REVISION. THE PAGES BEING REVISED AND THE DESCRIPTION OF THE REVISION SHOULD BE NOTED UNDER REASON.																																		
REV	DATE	BY	CK	APPROVALS				PAGES REVISED	REASON																									
				DEPT.	PROJ.	CLIENT-DATE																												
03	11/07/2012	AHD	NJT						For approval																									
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>CODE</th> <th></th> <th>DATE</th> <th>CHK</th> <th>APP</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Certified, work may proceed</td> <td>28/2/12</td> <td>PD</td> <td>KJT</td> </tr> <tr> <td>2</td> <td>Comments as indicated, revise and resubmit, work may proceed subject to incorporation of changes as indicated</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>Comments as indicated, revise and resubmit, work may not proceed</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>Review not required, work may proceed</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>"Permission to proceed does not constitute acceptance of design detail calculations, analysis test methods or materials developed or selected by the vendor / contractor, and does not relieve the vendor / contractor from full compliance with contractual obligations"</p> <p style="text-align: center;">JACOBS ENGINEERING INDIA PVT. LTD.</p>										CODE		DATE	CHK	APP	1	Final Certified, work may proceed	28/2/12	PD	KJT	2	Comments as indicated, revise and resubmit, work may proceed subject to incorporation of changes as indicated				3	Comments as indicated, revise and resubmit, work may not proceed				4	Review not required, work may proceed			
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<input type="checkbox"/> ENTIRE SPECIFICATION ISSUED THIS REVISION <input type="checkbox"/> REVISED PAGES ONLY ISSUED THIS REVISION				SPECIFICATION ISSUED FOR <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> IN HOUSE REVIEW <input type="checkbox"/> CLIENT APPROVAL <input type="checkbox"/> ENQUIRY </div> <div> <input type="checkbox"/> PURCHASE <input type="checkbox"/> CONSTRUCTION </div> </div>																														

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For Steam Flow in m3/hr.

API Plan	Fluid	Flow lpm	Temp. °C	Pressure kgf/cm ²	SULZER WBS. NO.	Q/0100067705-0020
23	Pumped Fluid	3	60	-	SULZER DOC. NO.	SMD1000677050020-01
65	-	-	-	-	SULZER CAVITY NO.	1-204.652.023

SLEEVE THICKNESS (MIN.)	2.95 mm
SLEEVE THICKNESS UNDER SHRINK DISK AREA	3.5 mm ①
THROTTLE BUSH CLEARANCE (RADIAL)	0.113 mm ①



CONNECTION DETAILS			
SYMBOL	FUNCTION	NPT	API PLANS
FI	FLUSH IN	1/2	23
FO	FLUSH OUT	1/2	23
D	DRAIN	① 1/2	65

SEAL ARRANGEMENT 1CW-FL ①
SEAL CHAMBER SIZE: 6

SEAL IS AS PER API 682 3rd EDITION.

M.A.W. Pr. • MAX. OP. TEMP.	M.A.W. TEMP. ①
90 bar(g) • 150°C ①	150°C

Customer	SULZER PUMPS (I) LTD.	Parameter	Min.	Nor.	Max.	API 682 Code	C2A1ES2365
P.O. NO & Date	EF09029/714-00	Suc. Pr. bar(g)	1.43	2.37(rat) ①	4.7	API 610 Code	BSTIN ①
End User	NIS REFINERY SERBIA	Dis. Pr. bar(g)	.	54.46(rat) ①	.	Eqpt. Make	SULZER PUMPS (I) LTD.
Project	Pancevo Oil Refinery Modernization Project, 77000	Vap. Pr. bar(a)	.	1.43	.	Eqpt. Type	GSG
Service	BFW PUMP	Box Pr. bar(g)	1.43 ①	2.37(rat) ①	4.7 ①	Bkt. Size	.
Eqpt. NO.	GA-5002 A/B	Temp. (°C)	.	110	.	Eqpt. Size	80-260 (Stages 8) ①
OEM W.O. NO.	1116009/02	Visc. (mPa.s)	.	0.26 ①	.	Speed (rpm)	2980 DOR from D.E. CW
DOR NO.	.	Media	BOILER FEED WATER				
S.O. NO.	11402972	Abrasive (%)	.	.	.	Sp.Gr.	0.951 Cooling Plan
① Customer's Supply		* Recommended Spares		Parts not numbered are Customer's supply			

Tightening Torque marked on the Shrink Disk.
Tighten screws uniformly and in sequence.
Final check with a torque wrench.

NOTES :

- FOR NDE REFER DRG. NO. 09-SHPV5/80-E2

③ NIS DRG. NO. 01692-31-50-9045
③ Pipe connections marked by stamp letters

max. allowed axial movement of the shaft to the housing ±2.0mm (± inches)

CAUTION: ASSEMBLY FIXTURE (PART NO. 14) TO BE REMOVED OR SWUNG OUT AFTER FINAL ASSY. & BEFORE START UP.

No.	DESCRIPTION	MATERIAL	QTY
* 15	HEX SCREW	A4-70 (SS316)	4
14	ASSEMBLY FIXTURE	SS316	4
13	SHRINK DISK	ST. VERZ./PASS	1
① * 12	HEX SCREW	A4-70 (SS316)	4
① 11	WASHER	SS316	1
① * 10	SPRING	SS316Ti	4
* 9	THROTTLE RING	BUKO 1 (CARBON)	1
* 8	O-RING	K (FFKM) ①	1
* 7	GLAND	SS316	1
* 6	SET SCREW	A4-70 (SS316)	2
* 5	O-RING	K (FFKM) ①	1
③ 4	SEAT HOUSING WITH PUMPING RING	SS316	1
* 3	O-RING	K (FFKM) ①	1
2	SHAFT SLEEVE	SS316	1
1.7	PIN	SS316	3
* 1.6	O-RING	K (FFKM) ①	1
* 1.5	SEAT	BUKA 20 (SILICON CARBIDE, REACTION BONDED)	1
* 1.4	BACK-UP RING	T3 (PTFE)	1
* 1.3	SPRING	HAST. C	8
* 1.2	O-RING	K (FFKM) ①	1
* 1.1	SEAL FACE	BUKO 03 (CARBON) + SS329	1
1	MECHANICAL SEAL	AQ2KMG ①	1

POS. DESCRIPTION MATERIAL QTY

	Date	Name	EagleBurgmann. EagleBurgmann India Pvt. Ltd.
Drawn By	16/05/11	HASEEN	
Checked By	16/05/11	JOBISH	
Approved By	16/05/11	SALDANHA	

Scale	%	Type	Size	Code
MECHANICAL SEAL	I.B.	SHPV5	80	AQ2KMG ①
	O.B.	.	.	.

Drg. No.	09-SHPV5/80-E1	Rev.	Issue	Ref. No.
		3	.	29850

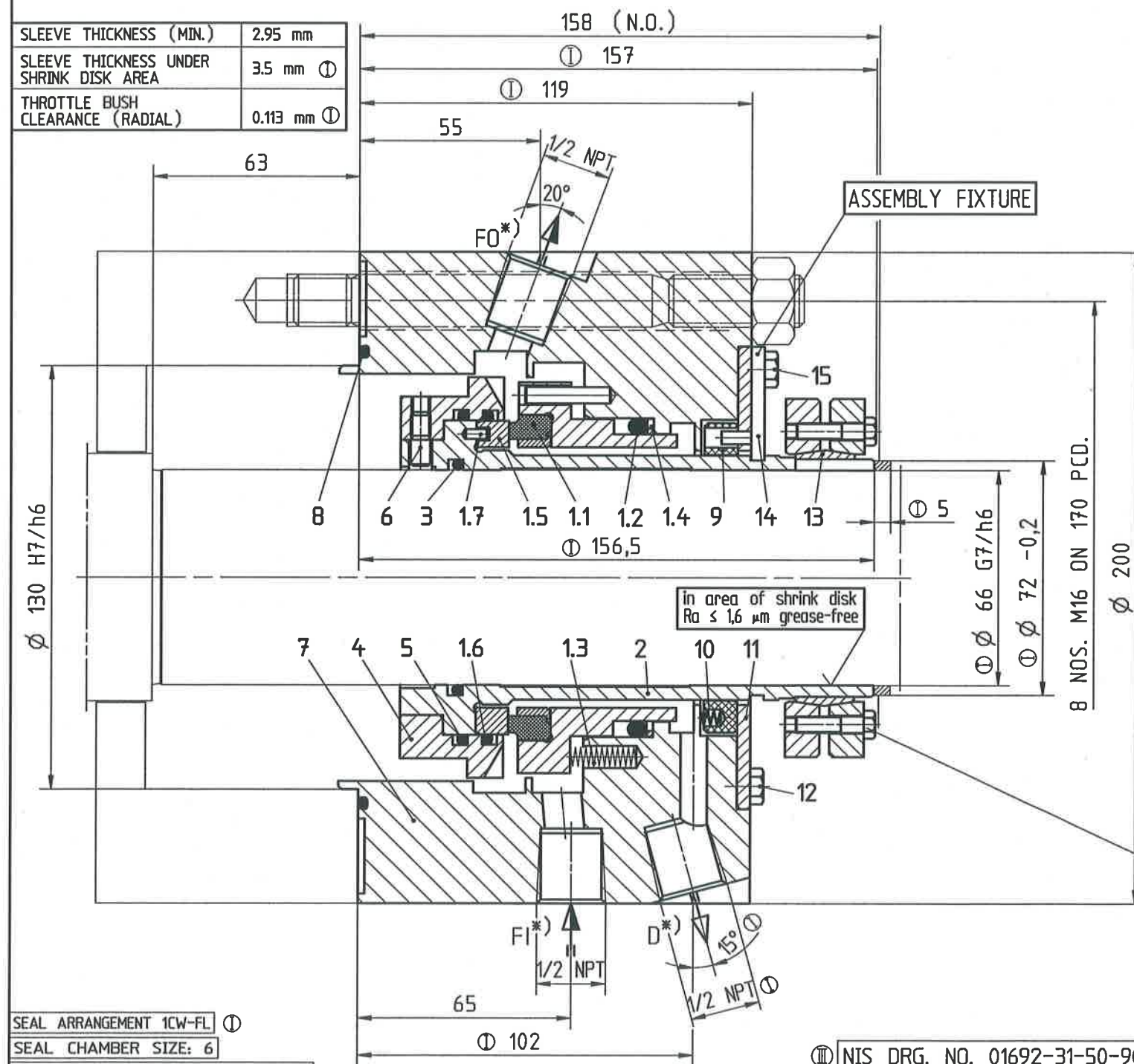
Replacement for All dimensions are in mm
If in doubt ask. CAD

EagleBurgmann.
EagleBurgmann India Pvt. Ltd.

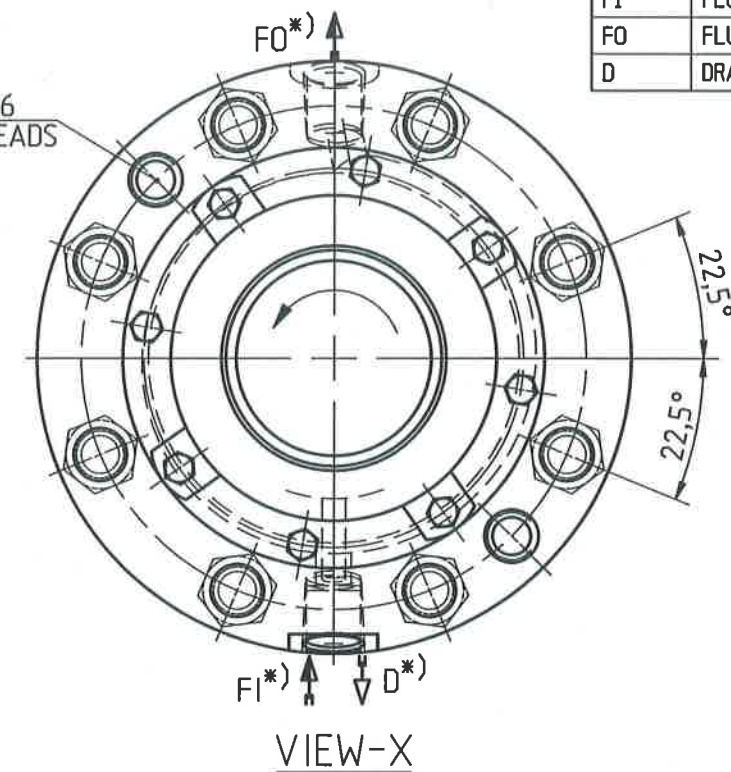
For Steam Flow in m3/hr.

API Plan	Fluid	Flow lpm	Temp. °C	Pressure kgf/cm ²	SULZER WBS. NO.	Q/0100067705-0020
23	Pumped Fluid	3	60	-	SULZER DOC. NO.	SMD1000677050020-02
65	-	-	-	-	SULZER CAVITY NO.	1-204.652.023

SLEEVE THICKNESS (MIN.)	2.95 mm
SLEEVE THICKNESS UNDER SHRINK DISK AREA	3.5 mm ①
THROTTLE BUSH CLEARANCE (RADIAL)	0.113 mm ①



CONNECTION DETAILS			
SYMBOL	FUNCTION	NPT	API PLANS
FI	FLUSH IN	1/2	23
FO	FLUSH OUT	1/2	23
D	DRAIN	① 1/2	65



CAUTION: ASSEMBLY FIXTURE (PART NO. 14) TO BE REMOVED OR SWUNG OUT AFTER FINAL ASSY. & BEFORE START UP.

No.	DESCRIPTION	MATERIAL	QTY
* 15	HEX SCREW	A4-70 (SS316)	4
14	ASSEMBLY FIXTURE	SS316	4
13	SHRINK DISK	ST. VERZ./PASS	1
① * 12	HEX SCREW	A4-70 (SS316)	4
① 11	WASHER	SS316	1
① * 10	SPRING	SS316Ti	4
* 9	THROTTLE RING	BUKO 1 (CARBON)	1
* 8	O-RING	K (FFKM) ①	1
7	GLAND	SS316	1
* 6	SET SCREW	A4-70 (SS316)	2
* 5	O-RING	K (FFKM) ①	1
③ 4	SEAT HOUSING WITH PUMPING RING	SS316	1
* 3	O-RING	K (FFKM) ①	1
2	SHAFT SLEEVE	SS316	1
1.7	PIN	SS316	3
* 1.6	O-RING	K (FFKM) ①	1
* 1.5	SEAT	BUKA 20 (SILICON CARBIDE, REACTION BONDED)	1
* 1.4	BACK-UP RING	T3 (PTFE)	1
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* 1.1	SEAL FACE	BUKO 03 (CARBON) + SS329	1
1	MECHANICAL SEAL	AQ2KMG ①	1

NOTES :

- FOR DE REFER DRG. NO. 09-SHPV5/80-E1

Pipe connections marked by stamp letters

max. allowed axial movement of the shaft to the housing ±2.0mm (± inches)

SEAL ARRANGEMENT 1CW-FL ①

SEAL CHAMBER SIZE: 6

SEAL IS AS PER API 682 3rd EDITION.

M.A.W. Pr. & MAX. OP. TEMP.	M.A.W. TEMP. ①
90 bar(g) & 150°C ①	150°C

GLAND HYDRO TEST
① 135 bar(g)

NIS DRG. NO. 01692-31-50-9045

ENG. CONTRACTOR: Heurtey Petrochem SA France

NDE

CONSULTANT: JACOBS

SEAL ASSEMBLY DRAWING

Supply System Drawing no.

C2A1ES2365

API 682 Code

API 610 Code

Eqpt. Make

Eqpt. Type

Bkt. Size

Eqpt. Size

Speed(rpm)

Media

Abrasive (%)

Sp.Gr.

Cooling Plan

No.

Modification

Date

Name

Drawn By

Checked By

Approved By

Scale

Type

Size

Code

I.B.

O.B.

Customer

P.O. NO & Date

End User

Project

Service

Eqpt. NO.

OEM W.O. NO.

DOR NO.

S.O. NO.

Customer's Supply

Recommended Spares

Parts not numbered are Customer's supply

Parameter

Min.

Nor.

Max.

Suc. Pr. bar(g)

Dis. Pr. bar(g)

Vap. Pr. bar(a)

Box Pr. bar(g)

Temp. (°C)

Visc. (mPaS)

Media

Abrasive (%)

API 682 Code

API 610 Code

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