DSP Critical Data

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TRUFLO ANSI Pump Specs

Casing:

The pump casing is end suction and top discharge ANSI B73.1 design with 150 lb ANSI flat face flange as standard inlet and outlet connections. Inlet and outlet flanges are available in 150 lb or 300 lb and raised or flat face connections. The casing is of the back pull out design which allows complete disassembly without disturbing the piping or motor. The casing is supported by a rigid foot mount for a maximum resistance to unanticipated load. Confined gasket between casing and stuffing box insures positive seal. Unit is also supplied with 1/4" tap on the discharge flange. Case will have enough designed strength to allow a 1/8" corrosion allowance. Case shall be rated to withstand a hydrostatic test of 1.5 times the maximum design pressure.

Impeller:

The impeller is of open design for maximum efficiency, hydraulically balanced, with the best wear characteristics and no axial adjustments. The impeller is attached to the shaft by means of a MNPT bore on reverse side. Impeller is of a open design and has rear pump out vanes to minimize stuffing box pressure. The impeller clearances can be set externally via jack bolts on outboard side of the pump. All impellers are dynamically balanced.

Back Cover Plate; Seal Chamber:

Standard design is cylindrical bore and oversized for increased circulation. Stuffing box can accept a variety of mechanical seals such as single, double (inside and out) unbalanced, balanced and with the sealing gland secured by four bolts. Seal chamber area is self flushing and has provision for venting. Seal gland bolt hole circle is designed to handle commonly available cartridge seals. ANSI flush plans are also available.

Shaft:

Standard shaft is heavy duty, sleeveless shaft with maximum diameter in critical areas and with minimum shaft overhang. Maximum shaft deflection is less then 0.002" at the face of stuffing box. Shaft is also stepped to fit a variety of seal types.

Bearing Housing:

The bearing housing shall be sealed with labyrinth style bearing isolators to prevent contamination of the bearing lubricant. The bearing housing is to be supplied to have a large capacity oil chamber. Oil level is monitored by a large and easy to read 1" NPT sight glass. No re-machining is required to convert from oil to grease bearings.

Bearings

The inboard bearing carries only radial load, it is free to float axially in the frame. The outboard bearing is shouldered and locked to the shaft and housing to enable it to carry radial and thrust loads. All fits are precision machined to industry standards. The inboard bearing is a single row deep groove ball bearing. The outboard bearing is a double row angular contact bearing. The pump unit is to be designed to have a minimum bearing life (L10) of 17,000 hours.

Direction of Rotation

- **Shall be clockwise when viewed from the coupling end.**
- **Shall be counter clockwise when viewed from the suction end**

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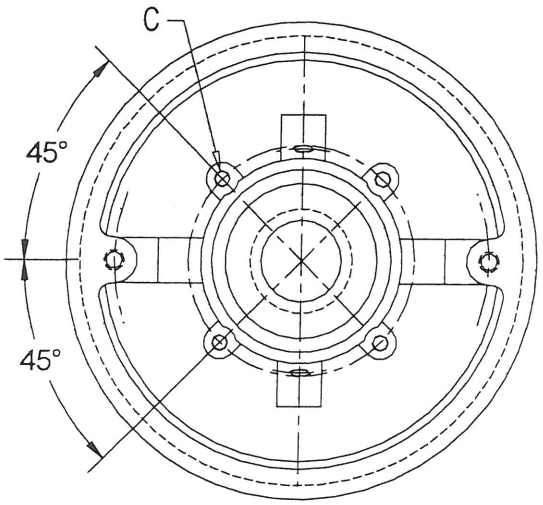

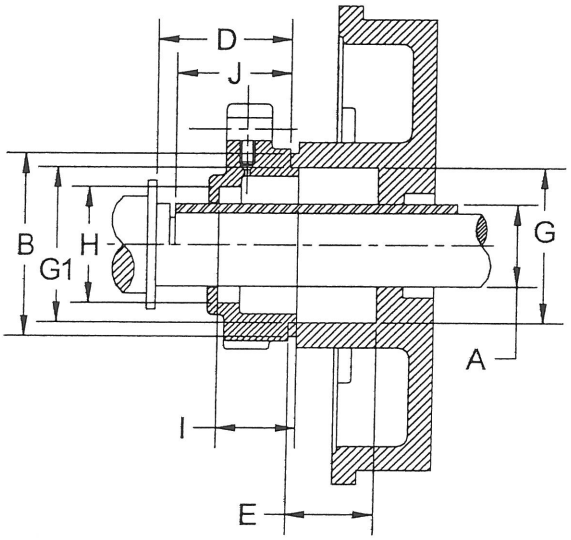

Large Bore Stuffing Box Information

PUMP SERIES	A	B	C DRILLING			D	E	G	H	J	I
			NO.	Size	B.C.						
GROUP I	1 3/8	3 3/8	4	3/8-UNC	4"	2 3/32	1 31/32	2 7/8	2 1/8	1 29/32	1 11/16
GROUP II	1 7/8	4 1/8"	4	1/2-UNC	5"	3 15/32	2 9/32	3 ½	2 5/8	2 17/64	1 13/16
GROUP III	2 5/8	5 1/8	4	1/2-UNC	6"		3	4 1/2			

Small Bore Stuffing Box Information

PUMP SERIES	A	B	C DRILLING			D	E	G	H	J	I
			NO.	Size	B.C.						
GROUP I	1 3/8	2 5/8	4	3/8-UNC	3 11/32	2 5/64	2 1/8	2 1/8	2 1/8	1 57/62	
GROUP II	1 7/8	3 5/32	4	1/2-UNC	4	3 13/36	2 5/8	2 5/8	2 5/8	2 7/32	
GROUP III	NA	NA	NA			NA	NA		NA	NA	NA

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Pump General Information

Pump Family	Pump Size	Impeller Eye Area	Number of Vanes	Max Solid Diameter	Inboard Bearing	Outboard Bearing	Shaft Dia *Solid Shaft*	Shaft Dia *Sleeved Shaft*	Shaft Dia *Coupling*
GRP I	1 x 1½ x 6	3.14	5	11/32"	6207	5306 AC3	1.375"	1.125"	0.875"
	3 x 1½ x 6	4.65	5	7/16"					
	3 x 2 x 6	6.5	5	3/8"					
	1½ x 1 x 8	3.55	5	11/32"					
GRP II & II0	3 x 1½ x 8	4.43	5	7/16"	6310	7310 BECBM	1.875"	1.5"	1.125"
	3 x 2 x 8	8.375	5	½"					
	4 x 3 x 8	11.03	5	21/32"					
	2 x 1 x 10	4.9	5	7/16"					
	3 x 1½ x 10	6.5	5	7/32"					
	3 x 2 x 10	7.7	5	3/8"					
	4 x 3 x 10	12.57	5	5/8"					
	4 x 3 x 10H	10.77	5	5/8"					
	6 x 4 x 10	24.3	5	1"					
	3 x 1½ x 13	4.9	5	7/32"					
	3 x 2 x 13	7.66	5	3/8"					
	4 x 3 x 13	14.2	6	5/8"					
	6 x 4 x 13	28	6	1"					
GRP III	8 x 6 x 13				6313	5313 A/C3	2.625"	2.125"	2 375"
	8 x 6 x 15								
	6 x 4 x 16								
	10 x 8 x 16H								

Pump Material Of Construction

Pump Material	DI	316	CD4	Alloy 20	Hastalloy-C
Casing	DI	316	CD4	Alloy 20	Hastalloy-C
Impeller	316	316	CD4	Alloy 20	Hastalloy-C
Box Cover	DI	316	CD4	Alloy 20	Hastalloy-C
Shaft (Solid)	316	316	CD4	Alloy 20	Hastalloy-C
Shaft (Sleeved)	Steel				
Sleeve	316	316	CD4	Alloy 20	Hastalloy-C
O-Ring, Impeller	Glass Filled Teflon				
Case Gasket	Glass Filled Teflon				
Case Bolts	Stainless				
Gland Bolts	Stainless				
Gland, Packing	316 SS				
Lybrinth Seals	Carbon Teflon				

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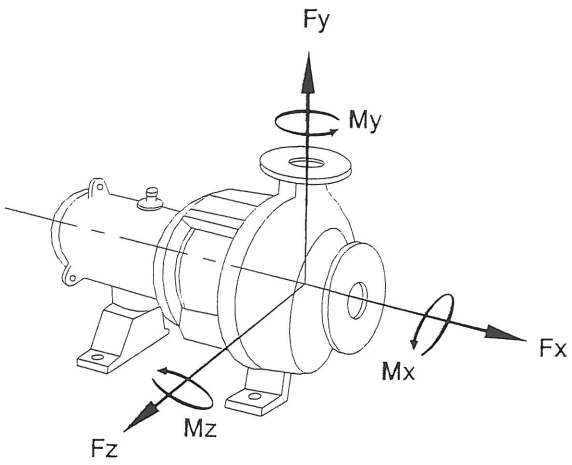
SIZE	FRAME	1150		1750		3500	
		Min Flow (gpm)		Min Flow (gpm)		Min Flow (gpm)	
1x1.5x6	Group I			4.84		4.84	
3x1.5x6	Group I			4.84		10.12	
3x2x6	Group I			10.12		19.80	
1.5x1x8	Group I			4.40		10.12	
3x1.5x8	Group I			10.12		19.80	
3x2x8	Group II			17.60		42.24	
4x3x8	Group II	36.96		56.32		105.60	
2x1x10	Group II	6.60		10.12		19.80	
3x1.5x10	Group II	3.38		10.12		55.80	
3x2x10	Group II	2.20		13.20		70.40	
4x3x10	Group II	24		35.20		104.72	
4x3x10H	Group II	25.50		150.00			
6x4x10	Group II	55.80		315.80			
3x1.5x13	Group II	7.92		31.08		126	
3x2x13	Group II	12.75		44.00		168.08	
4x3x13	Group II	47.08		117.68		245.08	
6x4x13	Group II	105.16		217.36			
8x6x13	Group III	374.88		799.92			
8x6x15	Group III	462		600			
6x4x16	Group III	203		290			
10x8-16H	Group III	77		1010			

TRUFLO DSP Flange Loading Data



PUMP SIZE	SUCTION						DISCHARGE					
	FX	FY	FZ	MX	MY	MZ	FX	FY	FZ	MX	MY	MZ
1516	40	54	69	49	41	10	11	71	35	21	10	13
3156	69	130	134	98	56	48	26	100	53	33	27	16
326	69	130	134	99	56	49	37	130	73	48	28	24
1518	40	54	69	49	41	10	11	71	35	21	10	13
3158	69	130	134	99	56	48	26	100	53	33	27	16
328	69	130	134	99	63	49	37	130	73	48	32	24
438	93	168	177	110	73	63	55	195	111	79	52	45
2110	52	88	94	68	43	14	11	67	30	21	15	21
31510	69	130	134	98	56	48	26	100	53	33	27	23
3210	69	130	134	99	63	49	37	130	73	48	32	24
4310	93	168	177	110	73	63	55	195	111	79	52	45
6410	149	276	285	168	129	92	68	241	133	97	73	53
31513	69	130	134	98	56	48	26	100	53	33	27	23
3213	69	130	134	99	63	49	37	130	73	48	32	24
4313	93	168	177	110	73	63	55	195	111	79	28	45
6413	149	276	285	168	129	92	68	241	133	97	73	53
8613	189	324	354	239	125	129	96	324	190	119	86	86
6416	149	276	285	168	129	63	68	241	133	97	73	53
8617	189	324	354	239	125	129	96	324	190	119	86	86
10816	173	347	405	224	138	135	99	381	237	158	93	97

Force = Kgf
Moment = Kgf-m

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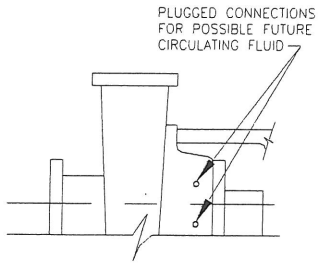
TRUFLO DSP pumps are designed to fit the most common mechanical seal flush plans. Below is a table of the commonly used ANSI flush plans. Note: below are ANSI flush plans. API flush plans, even though they may have similar nomenclature, are indeed different and require exceptions.

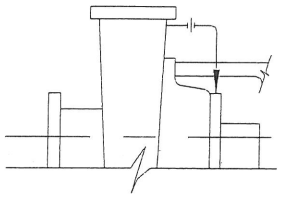
MECHANICAL SEAL PIPING PLANS

SEAL FLUSH PIPING



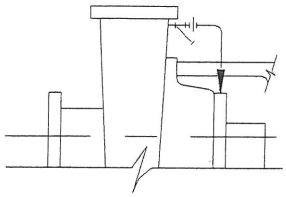
PLAN NO. 7302

DEAD-ENDED SEAL CHAMBER WITH NO CIRCULATION OF FLUSH FLUID. WATER COOLED SEAL CHAMBER JACKET AND THROAT BUSHING REQUIRED UNLESS OTHERWISE SPECIFIED.



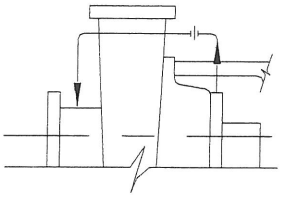
PLAN NO. 7311

RECIRCULATION FROM PUMP CASE THROUGH ORIFICE TO SEAL.



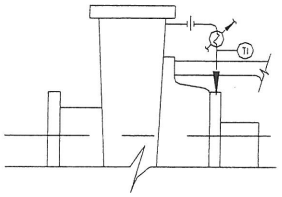
PLAN NO. 7312

RECIRCULATION FROM PUMP CASE THROUGH STRAINER AND ORIFICE TO SEAL.



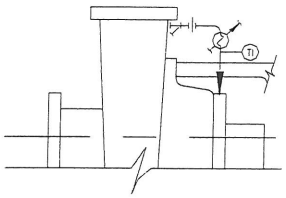
PLAN NO. 7313

RECIRCULATION FROM SEAL CHAMBER THROUGH ORIFICE AND BACK TO PUMP SUCTION.



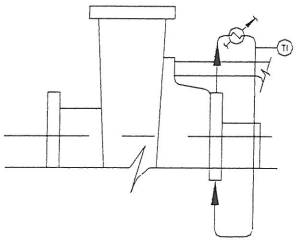
PLAN NO. 7321

RECIRCULATION FROM PUMP CASE THROUGH ORIFICE AND COOLER TO SEAL.



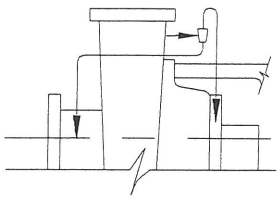
PLAN NO. 7322

RECIRCULATION FROM PUMP CASE THROUGH STRAINER, ORIFICE AND COOLER TO SEAL.



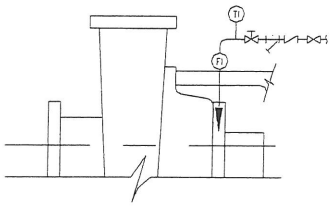
PLAN NO. 7323

RECIRCULATION FROM SEAL WITH PUMPING RING THROUGH COOLER AND BACK TO SEAL



PLAN NO. 7331

RECIRCULATION FROM PUMP CASE THROUGH CYCONE SEPARATOR DELIVERING CLEAN FLUID TO SEAL AND FLUID WITH SOLIDS BACK TO PUMP SUCTION.



PLAN NO. 7332

INJECTION TO SEAL FROM EXTERNAL SOURCE OF CLEAN, COOL FLUID.
(SEE NOTE 1)

LEGEND

- HEAT EXCHANGER
- (PI) PRESSURE GAGE WITH BLOCK VALVE
- (TI) DIAL THERMOMETER, ONLY WHEN SPECIFIED
- (PS) PRESSURE SWITCH, INCLUDING BLOCK VALVE, ONLY WHEN SPECIFIED
- CYCLONE SEPARATOR
- (FI) FLOW INDICATOR, ONLY WHEN SPECIFIED
- Y-TYPE STRAINER
- FLOW REGULATING VALVE
- BLOCK VALVE
- CHECK VALVE
- ORIFICE (REMOVABLE ORIFICE OR AN INTEGRAL PRESSURE BREAKDOWN ARRANGEMENT)

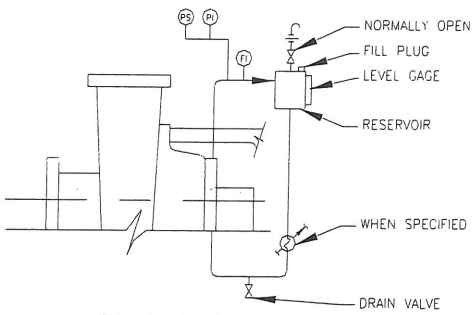
NOTE:

1. USEP SHALL SPECIFY FLUID CHARACTERISTICS WHEN SUPPLEMENTAL SEAL IS PROVIDED. MANUFACTUREP SHALL SPECIFY THE REQUIRED FLOW RATE AND PRESSURE WHERE THESE ARE FACTORS.

Seal flush plans continued.....

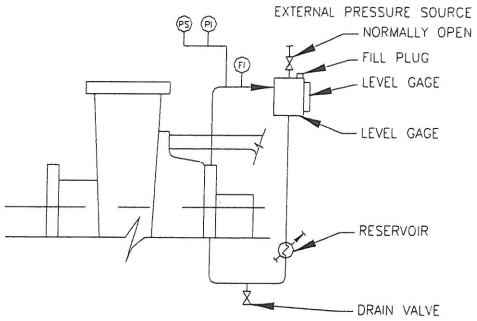
MECHANICAL SEAL PIPING PLANS

BUFFER FLUID AND QUENCH PIPING



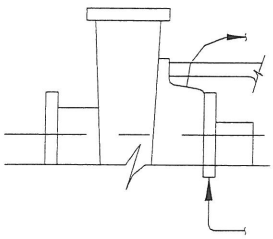
PLAN NO. 7352

EXTERNAL FLUID RESERVOIR FOR TANDEM SEALS.
THERMOSYPHON OR FORCED CIRCULATION,
AS REQUIRED.
(SEE NOTE 1)



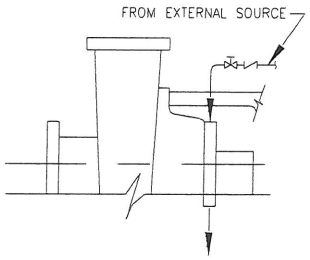
PLAN NO. 7353

EXTERNAL FLUID RESERVOIR FOR DOUBLE SEALS.
THERMOSYPHON OR FORCED CIRCULATION,
AS REQUIRED.
(SEE NOTE 1)



PLAN NO. 7354

CIRCULATION OF CLEAN BUFFER FLUID
FROM AN EXTERNAL SOURCE.
(SEE NOTE 1)



PLAN NO. 7362

EXTERNAL FLUID QUENCH
(STEAM, GAS, WATER, OTHER)
(SEE NOTE 1)

MATERIALS OF CONSTRUCTION

CODE A (a) TUBING: CARBON STEEL, 3/8 IN O.D. x 0.035 IN WALL, ASTM A519;
(b) TUBE FITTINGS: CARBON STEEL, BITE TYPE.

CODE B (a) TUBING: 316 STAINLESS STEEL, 3/8 IN O.D. x 0.035 IN WALL, ASTM A269;
(b) TUBE FITTINGS: 316 STAINLESS STEEL, BITE TYPE.

CODE C (a) PIPE: CARBON STEEL, 3/8 IN NOMINAL SCHEDULE 40, ASTM A106;
(b) PIPE FITTINGS: CARBON STEEL, 150#, ASTM A105.

CODE D (a) PIPE: STAINLESS STEEL, 3/8 IN NOMINAL SCHEDULE 40, ASTM A312;
(b) PIPE FITTINGS: 316 STAINLESS STEEL, 150#, ASTM A182.

CODE E TUBING: ARMORED TFE RESIN WITH SUITABLE ALLOY FITTINGS, DESIGN PRESSURE OF 350 PSI AT 500°F.

CODE F OTHER (SPECIFY).

GENERAL NOTE: THESE PLANS REPRESENT COMMONLY USED SYSTEMS. OTHER VARIATIONS ARE AVAILABLE AND SHOULD BE SPECIFIED IN DETAIL.

NOTE:

1 USER SHALL SPECIFY FLUID CHARACTERISTICS WHEN SUPPLEMENTAL SEAL IS PROVIDED. MANUFACTURER SHALL SPECIFY THE REQUIRED FLOW RATE AND PRESSURE WHERE THESE ARE FACTORS.