Operations Manual

Serial Number: 15E0140

Tanks – Processors – Silos – Pharmaceutical Vessels

Made Especially for:

[redacted]

ITEM	SIZE	QTY.	DESCRIPTION	SERVICE
A	24"	1	STANDARD FLARED VAPOR TITE MANWAY WITH HINGED COVER, GASKET AND HOLD DOWN	MANWAY
B	24"	1	REMOVABLE DROP IN DUMP GRID WITH 2" X 2" OPENINGS, FITS IN MANWAY	DUMP GRID
C	4"	1	SANITARY CLAMP CONNECTION WITH REMOVABLE 4" X 3" ECCENTRIC REDUCER INCLUDES GASKET & CLAMP (LESS VALVE)	OUTLET
D	4"	1	STANDARD CLAMP-ON VENT ASSEMBLY WITH SCREEN, SHROUD, AND GASKET MOUNTED ON A SANITARY CLAMP CONNECTION	VENT
A E	2"	5	SANITARY CLAMP CONNECTION	INLET
F	4"	1	SANITARY CLAMP CONNECTION	INLET
A G	3"	2	SANITARY CLAMP CONNECTION	INLET
H	2"	1	SANITARY CLAMP CONNECTION	INLET
J	1.5"x3"	2	SANITARY CLAMP CONNECTION WITH REMOVABLE SPRAY BALL UNIT MOUNTED IN SANITARY CLAMP CONNECTION	CIP
K	1-1/4"	1	PROJECTILE WELL (ANDERSON EQUIV. #41247) (TAYLOR EQUIV. #26P397) (LESS DEVICE)	THERMOWELL
L	–	1	VERTICAL CENTER BOTTOM OFF-SET V-BELT DRIVEN AGITATOR, POWERED BY A 75 HP TEFC SINGLE SPEED INVERTER DUTY MOTOR OPERATING @ 1,800 RPM, 460/230/60/3 (LESS SWITCH) INCLUDES: 12" DIA IMPELLER, DOUBLE MECHANICAL SEAL ON AGITATOR SHAFT WITH WATER FLUSH, STANDARD BEARINGS ON SHAFT, MOTOR SUPPORTS, V-BELT DRIVE ASSEMBLY, AND BELT GUARD NOTES : – AGITATOR IS DESIGNED FOR PRODUCTS WITH A MAX VISCOSITY OF 2,500 CPS – CONSULT FACTORY IF PRODUCT WILL CRYSTALLIZE, HARDEN, OR IS OF A HIGHER VISCOSITY THAN STATED – SEAL REQUIRES 35 PSI CLEAN WATER SUPPLY @ 1 GPM MINIMUM, FAILURE TO SUPPLY WILL RESULT IN SEAL FAILURE	AGITATION
M	–	2	FIXED SIDEWALL BAFFLE THAT EXTENDS DOWN INTO THE CONE HEAD	BAFFLE
N	–	1	BASE FRAME WITH BRACING AND (6) ADJUSTABLE BALL FEET (ALL WELDS TO BE CONTINUOUS)	BASE
P	–	4	LIFTING LUGS (2) ON THE FRAME AND (2) ON THE TOP HEAD	LIFTING LUGS

NOTES:

1. ALL PRODUCT CONTACT MATERIAL TO BE 316L UNLESS NOTED OTHERWISE.

INTERNAL FINISH SPECIFICATION:	
MATERIAL:	#4 FINISH
WELDS:	MP32 / 32RA
EXTERNAL FINISH SPECIFICATION:	
MATERIAL:	#4 FINISH
WELDS: EXCEPTIONS: FRAME MOTOR SUPPORTS BRACING MANWAY HRDWR	MP35EX / 35RA MCO – CLEANED ONLY TO REMOVE DISCOLORATION (WELD RIPPLE VISIBLE)

WEIGHTS:	
EMPTY VESSEL: 2,450 LBS.	FULL @ NOM. CAPACITY: 6,618 LBS. USING PRODUCT S.G. = 1.00

CIP REQUIRED:	40 GPM @ 25 PSIG EACH BALL
	80 GPM @ 25 PSIG TOTAL

DESIGN DATA

VESSEL WORKING CAPACITY: 500 GALLONS

VESSEL DESIGN CONDITIONS:
ATMOSPHERIC @ AMBIENT OPERATION
SEISMIC DESIGN: IBC 2012 – SITE CLASS 'D'

VESSEL MATERIAL:	SPEC.	GRADE	THICKNESS/CLASS	NOTES
SHELL:	SA-240	316L	10 GA. (0.1350")	60" I.D.
TOP HEAD (STD F&D):	SA-240	316L	10 GA. (0.1350")	60" I.D.
BOTTOM HEAD (TORICONICAL):	SA-240	316L	10 GA. (0.1350")	60" I.D. WITH 120° INCLUDED ANGLE
SANITARY CLAMP FERRULES:	SA-479	316L	–	–
PRODUCT CONTACT TUBING:	SA-249	316L	–	–
THERMOWELL:	SA-479	316L	–	–
BAFFLE:	SA-240	316L	10 GA. (0.1350")	–
DUMP GRID:	–	316L	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
OTHER MATERIAL:				
TANK LEGS:	SA-312	304	2-1/2" SCH 40	–
FRAME LEGS:	SA-312	304	2" SCH 40	–
FRAME	SA-249	304	3" X 3" X 3/16"	–
LEG BRACING:	SA-312	304	1-1/2" SCH 40	–
LIFTING LUG:	SA-240	304	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
MANWAY GASKET:	–	FDA	–	N-SHAPED WHITE SILICONE

SHOP TOLERANCES:	
SHELL: DEVIATION FROM VERTICAL: ± 1/2" OUT OF ROUNDNESS: ± 1" OF NOM. "D"	NOZZLES: PROJECTION: SHORTEST DISTANCE FROM OUTSIDE SURFACE TO FLG. FACE ± 1/4" DEVIATION FROM HORIZONTAL, VERTICAL OR INTENDED POSITION ± 1/2° DEVIATION OF BOLT HOLES IN ANY DIRECTION ± 1/8" DEVIATION FROM ANGULAR LOCATION ± 1/2°.
HEADS: OUTER PROFILE: NOT TO EXCEED 1.25" OF NOM. "D" INNER PROFILE: NOT TO EXCEED .625" OF NOM. "D"	
MANWAY: LOCATION IN ANY PLANE ± 1/2"	
SUPPORTS: DEVIATION FROM ANGULAR LOCATION ± 1°. DEVIATION FROM REFERENCE LINE ± 1/4".	WELD FILLET SIZE: + 1/8", – 0"

A ONE TANK
15E0140

FELDMEIER EQUIPMENT, INC
SYRACUSE, NEW YORK. USA
WWW.FELDMEIER.COM
SERIAL NO. 15E0140

A

NO.	ALTERATION	DATE	CHG. BY
D	REVISED TO MATCH AS BUILT	6/18/15	JSH
C	REVISED TO MATCH AS BUILT; FRAME WIDTH WAS 45-5/8" OUT TO OUT	6/11/15	JSH
B	ROTATED ITEM 'C' FROM 0° TO 270°	4/29/15	JSH
A	MOVED TANK 15E0141 TO OWN DRAWING; ITEM 'E' WAS QTY (4); ITEM 'G' WAS QTY (1); STRAIGHT SIDE WAS 42";	4/20/15	JSH

QUOTE N º 20562BD0.doc | P.O. Nº. PDG036550

FELDMEIER EQUIPMENT
575 E. Mill Street
Little Falls, New York 13365

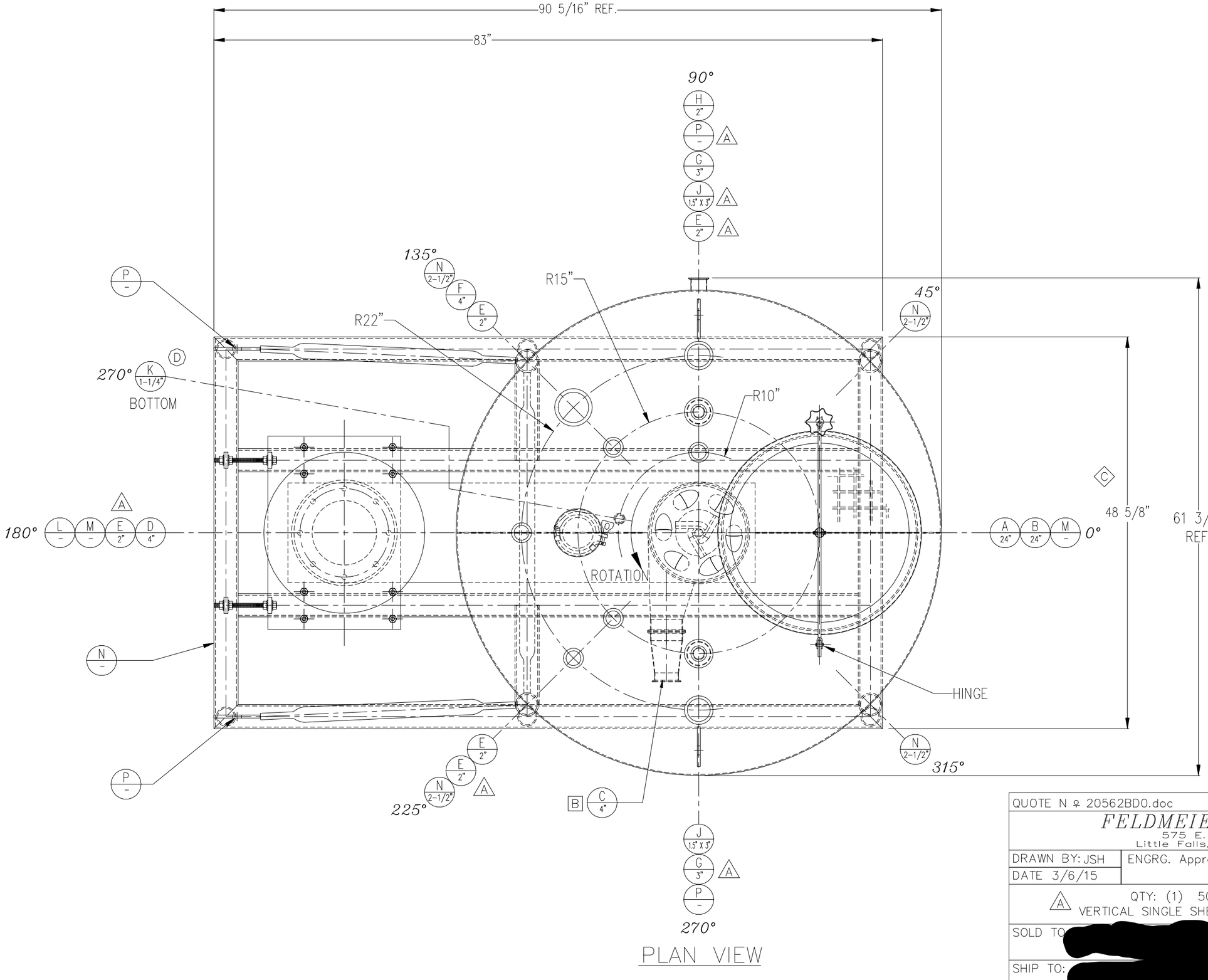
DRAWN BY: JSH	ENGRG. Approved By	CI	REV D
DATE 3/6/15			SHEET: 1 of 3

A QTY: (1) 500 GALLON X 60" ROUND
VERTICAL SINGLE SHELL V-BELT DRIVE "RAPID MIXER"

SOLD TO: [redacted]

SHIP TO: [redacted]

DRAWING NO. 15E0140



PLAN VIEW

A ONE TANK 15E0140

QUOTE N º 20562BD0.doc	P.O. №. PDG036550

FELDMEIER EQUIPMENT
575 E. Mill Street
Little Falls, New York 13365

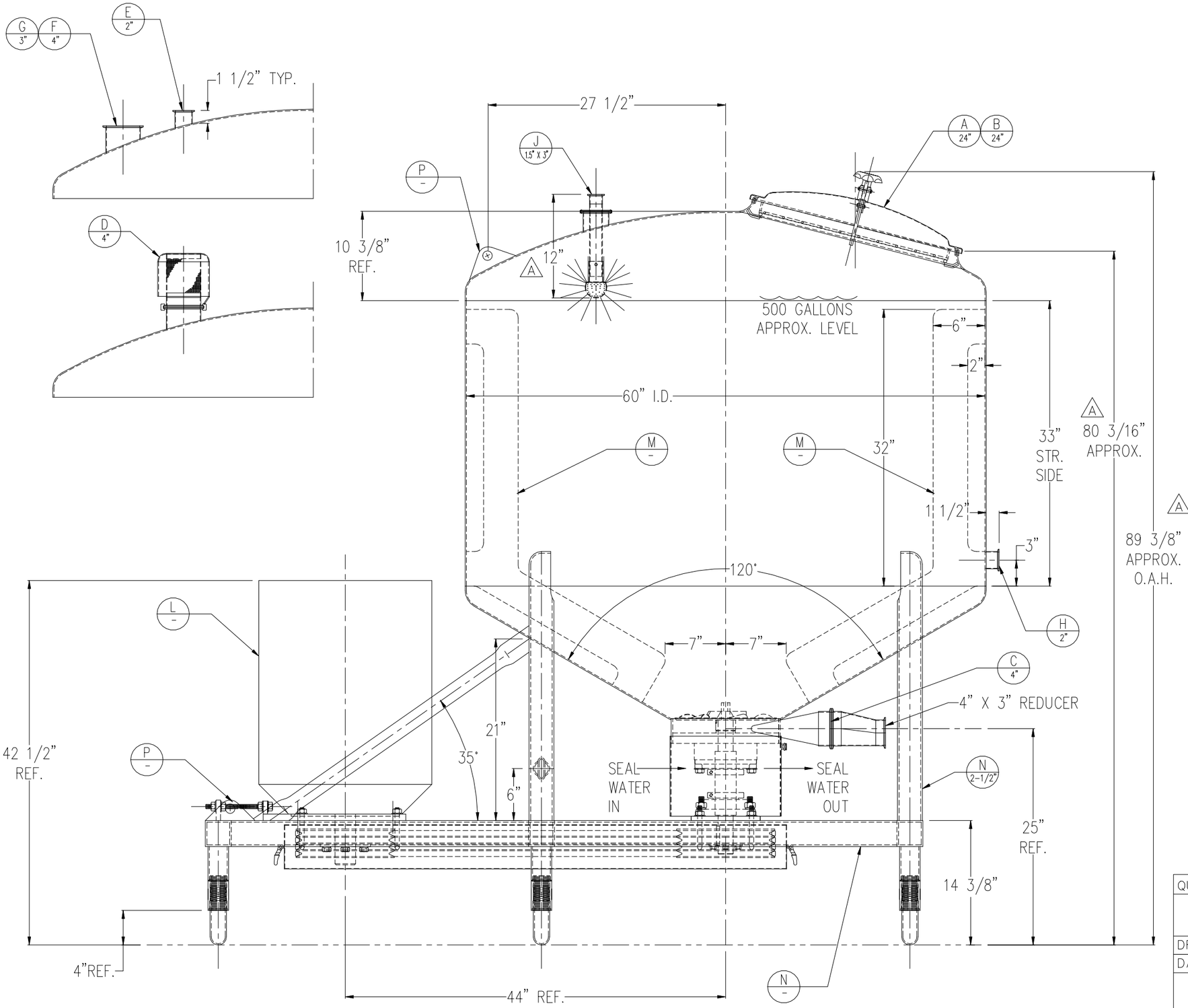
DRAWN BY: JSH	ENGRG. Approved By	CI	REV D
DATE 3/6/15			SHEET: 2 of 3

A QTY: (1) 500 GALLON X 60" ROUND
VERTICAL SINGLE SHELL V-BELT DRIVE "RAPID MIXER"

SOLD TO: [redacted]

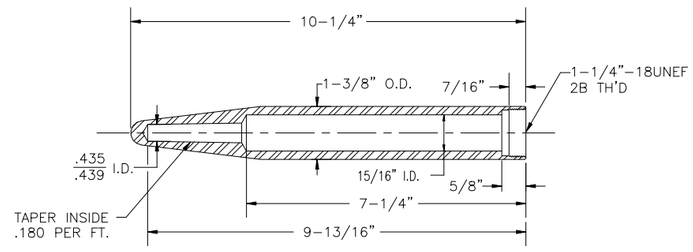
SHIP TO: [redacted]

DRAWING NO. 15E0140

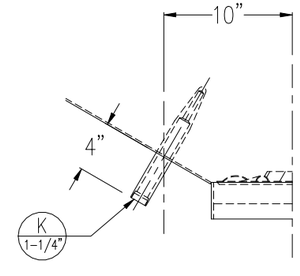


ELEVATION

SEE PLAN VIEW
FOR TRUE ORIENTATION

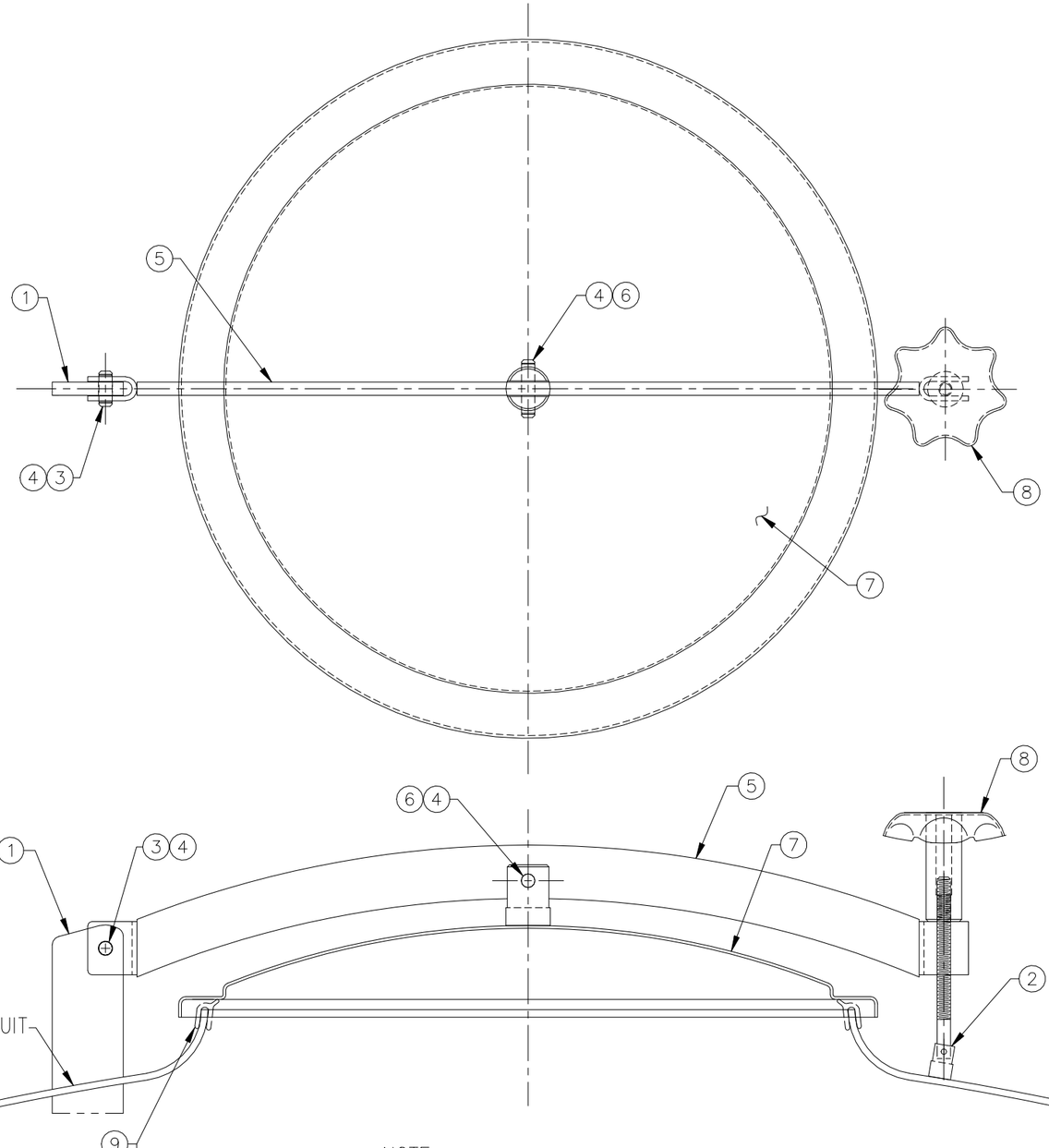


WELL DETAIL K 1-1/4"

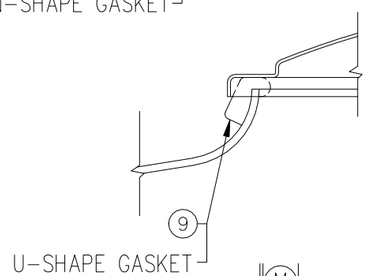


A ONE TANK 15E0140

QUOTE N º 20562BD0.doc			P.O. №. PDG036550
FELDMEIER EQUIPMENT 575 E. Mill Street Little Falls, New York 13365			
DRAWN BY: JSH	ENGRG. Approved By	CI	REV D
DATE 3/6/15			SHEET: 3 of 3
A QTY: (1) 500 GALLON X 60" ROUND VERTICAL SINGLE SHELL V-BELT DRIVE "RAPID MIXER"			
SOLD TO: [redacted]			
SHIP TO: [redacted]			DRAWING NO. 15E0140



NOTE:
COVER SHOWN TO SCALE IS 18" SIZE



TOP HEAD ASM COMPONENTS OPTION P.N.: 2501992-1			
ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	2501126-1	HINGE PLATE
2	1	1027093	SWIVEL BOLT ASM

FAMILY CODE COMPONENTS			
ITEM	QTY.	PART NUMBER	DESCRIPTION
3	1	2501129-1 OR -4	HINGE PIN
4	4	1959103	RET RING
5	1	SEE COVER SIZE TABLE	HINGE ARM
6	1	1027811	PIN-COVER CLEVIS
7	1	SEE COVER SIZE TABLE	COVER WITH CLEVIS
8	1	2500440-1	HAND KNOB
9	1	SEE BOM	GASKET

GASKET 16"	
4030465S	SILICONE
4030465E	EPDM-BLACK
4030465V	VITON-BLACK '3A'
1554254	SILICONE-WHITE (N-SHAPE)
M 1414274	EPDM-BLACK (N-SHAPE)

GASKET 18"	
4026229G	NEOPRENE (GRAY RUBBER)
4026229S	SILICONE
4026229E	EPDM-BLACK
J 1417173	EPDM-BLACK (N-SHAPE)
4026229EW	EPDM-WHITE — WHITE EPDM NOT AVAILABLE
1590780V	VITON-BLACK '3A' (N-SHAPE)
1554255	SILICONE-WHITE (N-SHAPE)

GASKET 20"	
4025511S	SILICONE
4025511E	EPDM-BLACK
4025511V	VITON-BLACK '3A'
1554256	SILICONE-WHITE (N-SHAPE)
L 1414273	EPDM-BLACK (N-SHAPE)

GASKET 24"	
1590694S	SILICONE
1590694E	EPDM-BLACK
1590694EW	EPDM-WHITE — WHITE EPDM NOT AVAILABLE
1590694V	VITON-BLACK '3A' (N-SHAPE) — USE 1412784
1554259	SILICONE-WHITE (N-SHAPE)
1417049	VITON-WHITE '3A' (N-SHAPE) — WHITE VITON NOT AVAILABLE
K 1413513	EPDM-BLACK (N-SHAPE)
1412784	VITON-BLACK '3A' (N-SHAPE)

COVER SIZE TABLE		
SIZE	COVER ASM (7)	ARM (5)
16"	2501130-1 OR -4	2501123-1
18"	2501131-1 OR -4	2501123-1
20"	2501132-1 OR -4	2501124-1
24"	2501133-1 OR -4	2501124-1

VAPOR TITE MANWAY FAMILY CODE

DIGITS 1 2 3 4 5 6 7 8 9 10

1ST, 2ND, 3RD DIGITS
MWV = MANWAY VAPOR TITE

4TH, 5TH DIGIT - DIAMETER
16 = 16"
18 = 18"
20 = 20"
24 = 24"

6TH DIGIT - MATERIAL
1 = 304
4 = 316L

7TH DIGIT - THIMBLE LENGTH
0 = FLARED
3 = 3" LONG
6 = 6" LONG
9 = 9" LONG
A = 12" LONG
B = 15" LONG
C = 18" LONG

8TH DIGIT - HINGE TYPE
0 = STANDARD LIFT
1 = HEAVY DUTY LIFT
2 = LIFT AND SWIVEL

9TH, 10TH DIGIT - GASKET MATERIAL
00 = NONE
01 = NEOPRENE (NP) (GRAY RUBBER) ONLY 18"
02 = SILICONE (SL)
03 = EPDM-BLACK (EB)
04 = VITON-BLACK '3A' (N-SHAPE) (VI)
05 = EPDM-WHITE (EW) — NOT AVAILABLE
06 = SILICONE-WHITE (N-SHAPE) - STANDARD
07 = VITON-WHITE '3A' (N-SHAPE) — NOT AVAILABLE
08 = EPDM-BLACK (N-SHAPE) J

MATERIAL:
-1 = 304 STN STL
-4 = 316L STN STL

FINISH:

1. SEE FINAL ASSEMBLY DRAWINGS FOR ORIENTATIONS AND FINISH SPECIFICATIONS.
2. COVER MUST BE CENTERED ON OPENING +/-1/16"
3. USE N-SHAPE WHITE SILICONE GASKET (STANDARD MANWAY GASKET) UNLESS OTHERWISE SPECIFIED

NO.	ALTERATION	DATE	CHG.
M	ADDED EPDM-BLACK N-SHAPE 16"	05/23/11	ATB
L	ADDED EPDM-BLACK N-SHAPE 20"	05/10/11	ATB
K	ADDED EPDM-BLACK N-SHAPE 24"	6/29/10	RGF
J	ADDED EPDM-BLACK N-SHAPE 18"	09/04/08	KJB
I	BROKE OUT FAMILY CODE AND TOP HEAD ASM COMPONENTS INTO SEPERATE TABLES	11/17/08	ATB
H	ADDED WHITE VITON GASKET	09/04/08	KJB
G	FAMILY CODE: ADDED 06 SILICONE-WHITE (N-SHAPE) GASKET 16" ADDED: 1554254 - WHITE SILICONE (N-SHAPE) GASKET 18" ADDED: 1554255 - WHITE SILICONE (N-SHAPE) GASKET 20" ADDED: 1554256 - WHITE SILICONE (N-SHAPE) GASKET 24" ADDED: 1554259 - WHITE SILICONE (N-SHAPE) ADDED NOTE #3 ADDED N-SHAPE GASKET DETAIL	03/25/08	AWS

NO.	ALTERATION	DATE	CHG. BY
M	CHANGED VITON STANDARD GASKET TO BLACK '3A', NEW PART# 1590780V	10/10/07	GDA
E	ADDED 24" EW OPTION	07/27/07	KJB
D	ADDED FAMILY CODE CHART	02/28/07	ATB
C	ADDED 304SS OPTIONS	01/02/07	RGF
B	ADDED 18" SILICONE OPTION	08/14/02	RWZ
A	ADDED VITON OPTION	02/13/02	RGF

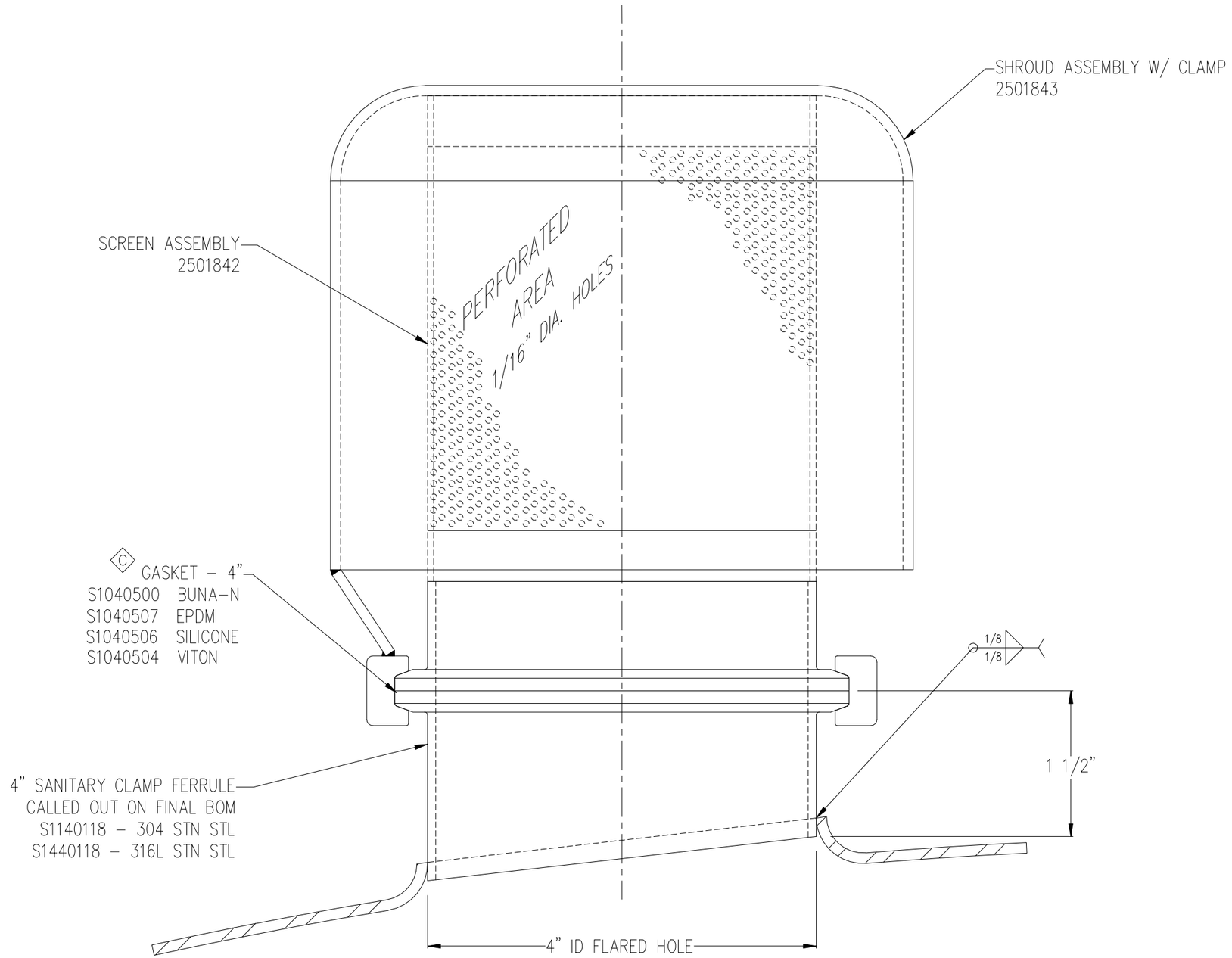
FILE#: L:\PROJECTS\PROD | DRAWN BY: DLC

FELDMEIER EQUIPMENT
575 E. Mill Street
Little Falls, NY 13365

SCALE:NONE | ENGRG. Approved By | AI | REV M
DATE: 12/21/01 | SHEET: 1 of 1

MANWAY DETAILS
VAPOR TITE W/FLARED OPENING

DRAWING NO. 2501111



OPTION NUMBER:
2501845 BUNA–N
2501845E EPDM
2501845S SILICONE
2501845V VITON

NOTE: SEE FINAL ASSEMBLY FOR LOCATION AND WELD FINISH

NO.	ALTERATION	DATE	CHG. BY
C	PUT GASKET BACK ON DRAWING	1/16/08	RDC
B	WAS PART P.N.: S1040500	3/13/07	AWS
A	REMOVED SHROUD CLIPS	2/16/07	RDC

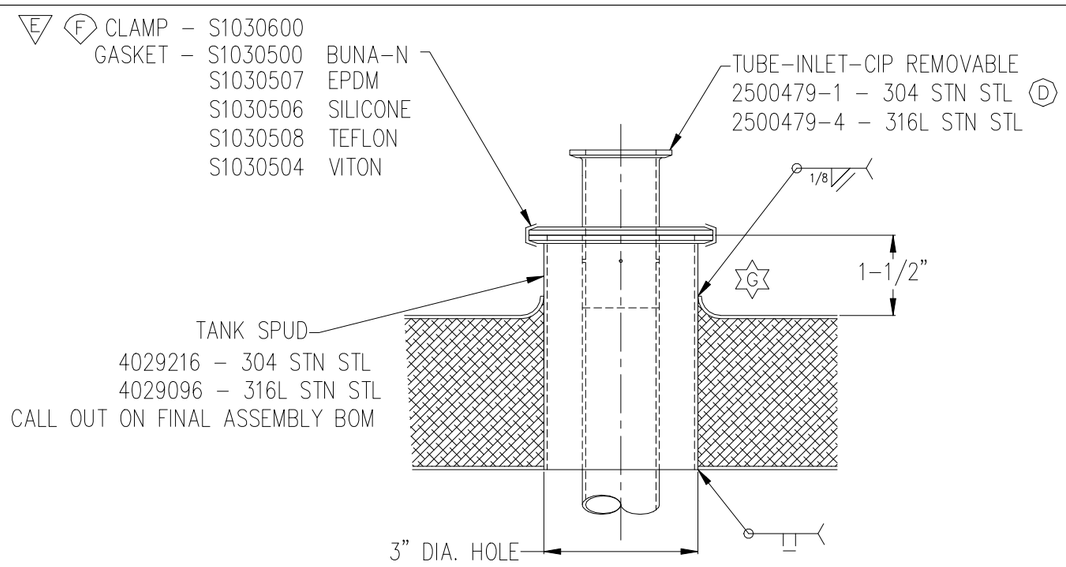
FILE#: L:\PROJECTS\PROD | DRAWN BY: RDC

FELDMEIER EQUIPMENT
575 E. Mill Street
Little Falls, NY 13365

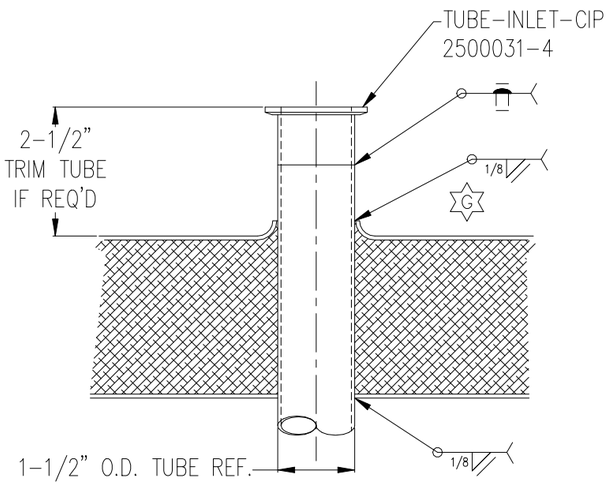
SCALE:NONE	ENGRG. Approved By	CI	REV C
DATE: 10/12/06			SHEET: 1 of 1

VENT DETAIL
VENT–4" CLAMP–ON ASM W/ SHROUD

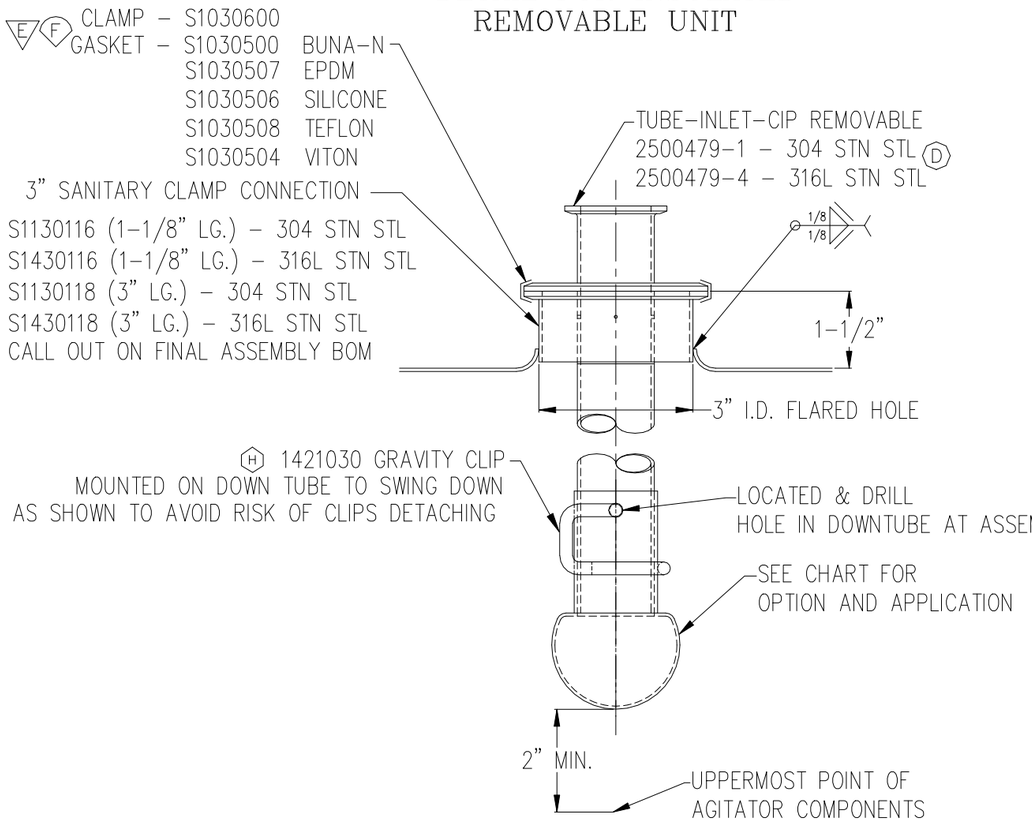
DRAWING NO. 2501845



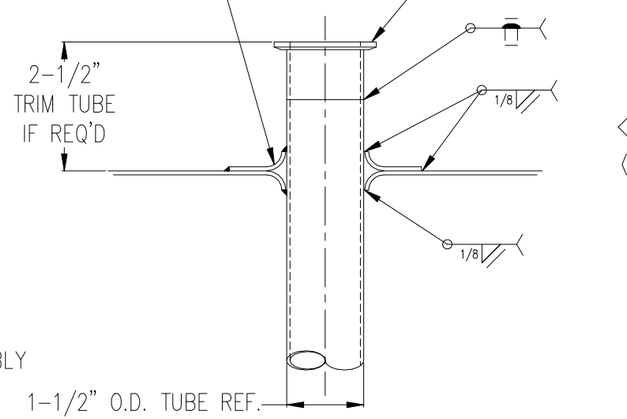
DETAIL FOR INSULATED REMOVABLE UNIT



DETAIL FOR INSULATED WELDED UNIT



H DETAIL FOR SINGLE SHELL REMOVABLE UNIT



DETAIL FOR SINGLE SHELL WELDED UNIT

OPTION NUMBER	APPLICATION	SPRAYBALL NUMBER
2500473–4	WELDED 360° FOR AGITATED VESSEL INSULATED TANKS	2501636–4
2502094–4	WELDED 360° FOR AGITATED VESSEL SINGLE SHELL TANKS	2501636–4
2500474–1 OR –4	REMOVABLE 360° FOR AGITATED VESSEL	2501636–4
2501753–4	WELDED 180° SPRAY UP FOR NON–AGITATED VESSEL INSULATED VESSEL	2501637–4
2502095–4	WELDED 180° SPRAY UP FOR NON–AGITATED VESSEL SINGLE SHELL TANKS	2501637–4
2501754–1 OR –4	REMOVABLE 180° SPRAY UP FOR NON–AGITATED VESSEL	2501637–4
2501755–4	WELDED 180° SPRAY DOWN FOR BRIDGE AND COVER SINGLE SHELL TANKS	2501638–4
2501756–1 OR –4	REMOVABLE 180° SPRAY DOWN FOR BRIDGE AND COVER	2501638–4
2501757–4	WELDED 180° SPRAY UP W/ BOTTOM SPRAY CLUSTER FOR BOTTOM DIRECT CLEANING INSULATED TANKS	2501639–4
2502096–4	WELDED 180° SPRAY UP W/ BOTTOM SPRAY CLUSTER FOR BOTTOM DIRECT CLEANING SINGLE SHELL TANKS	2501639–4
2501758–1 OR –4	REMOVABLE 180° SPRAY UP W/ BOTTOM SPRAY CLUSTER FOR BOTTOM DIRECT CLEANING	2501639–4

C D

NOTE: MATERIAL DESIGNATOR IS PART NUMBER SUFFIX
–1 = 304
–3 = 304L
–4 = 316L
–5 = HRS
–6 = C22
–7 = C2205
–8 = AL6XN
–9 = C276

GASKET MATERIAL SUFFIX:
NONE = BUNA–N
E = EPDM
S = SILICONE
T = TEFLON
V = VITON

NO.	ALTERATION	DATE	CHG. BY
H	SPRAYBALL WAS A MANUFACTURED PART NOW A PURCHASED PART USING GRAVITY CLIP	2/13/14	GDA
G	DELETED BEZELS	1/16/08	RDC
F	GASKET MATERIAL ADDED BACK INTO OPTION	1/16/08	RDC
E	GASKETS DELETED FROM OPTIONS CALL OUT ON FINAL ASSEMBLY BOM	10/22/07	DKB
D	ADDED –1 OPTIONS TO REMOVABLE	10/16/07	DKB
C	ADDED OPTION CHART	01/11/06	ATB
B	SPIRAL RING WAS HAIRPIN CLIP #2500625, PIN WAS #2500624	08/09/04	RDC
A	DELETED 304 SS COMPONENTS	07/22/99	DKB

NOTE:
1) SEE FINAL ASSEMBLY FOR WELD FINISH
2) RATED FOR 40 GPM @ 25 PSIG AT SPRAY UNIT
3) AVAILABLE IN 316L STN STL ONLY

FILE#: L:\PROJECTS\PROD\ | DRAWN BY: DKB

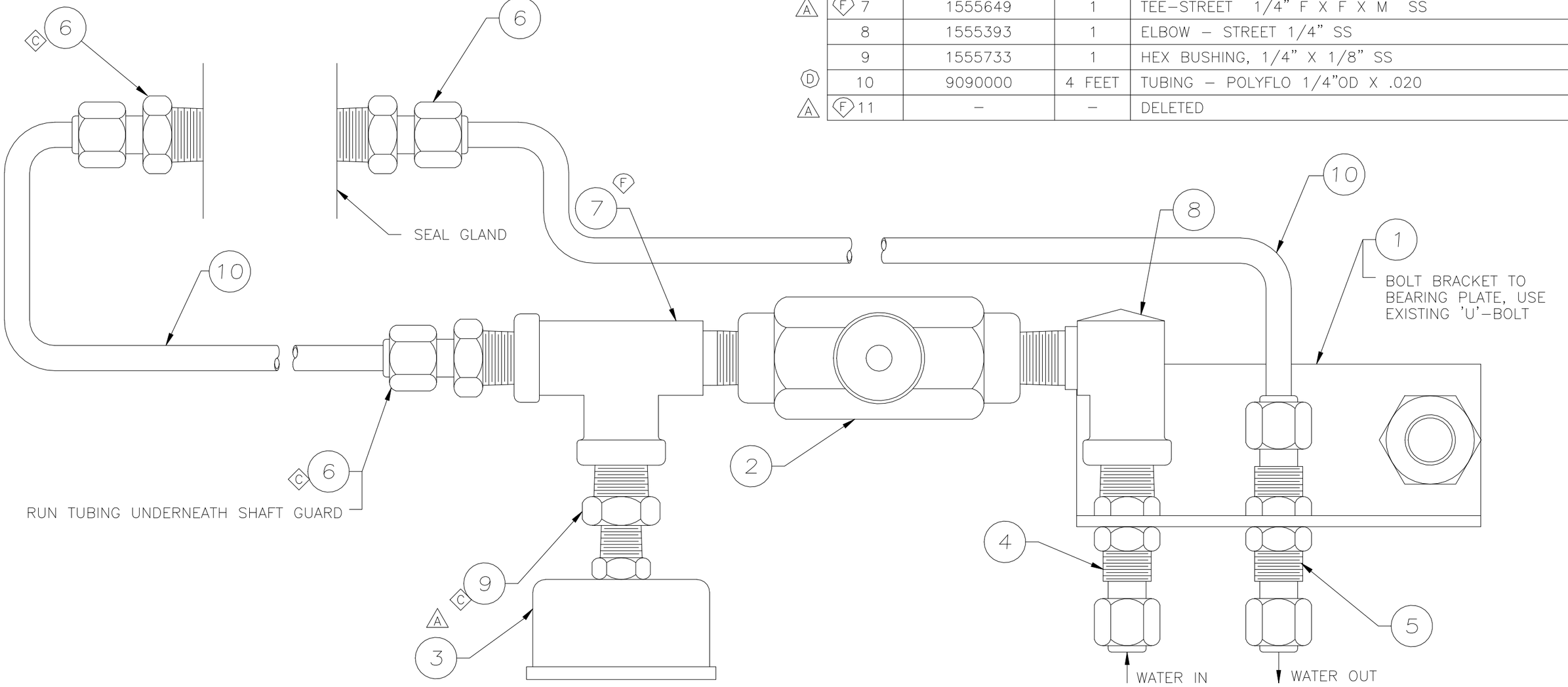
FELDMEIER EQUIPMENT
575 E. Mill Street
Little Falls, NY 13365

SCALE:X3 | ENGRG. Approved By | AI | REV H
DATE: 06/04/99 | SHEET: 1 of 1

SPRAY UNIT – SINGLE – 1–1/2" 'S' x 2–1/2" BALL WELDED / REMOVABLE W/ OPTIONS

DRAWING NO. 2500473

ITEM #	PART NUMBER	QTY	DESCRIPTION
1	1036890	1	MOUNTING BRACKET – FLUSH ACC
2	1556408	1	METERING VALVE, 1/4" OD X 1/4" FPT BRASS
3	1557544	1	PRESSURE GAUGE, 0–60 PSI 1/8" POLY
4	1555138	1	SWAGELOK BULKHEAD MALE CONN SS–400–11–4
5	1555144	1	SWAGELOK BULKHEAD UNION SS–400–61
E 6	1556116	3	SWAGELOK HALF UNION 1/4"X1/4 MPT
A F 7	1555649	1	TEE–STREET 1/4" F X F X M SS
8	1555393	1	ELBOW – STREET 1/4" SS
9	1555733	1	HEX BUSHING, 1/4" X 1/8" SS
D 10	9090000	4 FEET	TUBING – POLYFLO 1/4"OD X .020
A F 11	–	–	DELETED



IMPORTANT NOTES:

1) NEVER RUN MACHINE WITHOUT FLUSH WATER TO SEAL.
   FAILURE TO SUPPLY FLUSH WATER WILL RESULT IN SEAL FAILURE.
2) ADJUST FLUSH WATER TO 35 PSI APPROX AT 1 GPM. B
3) WATER SUPPLY SHOULD BE CLEAN.
4) USE TEFLON TAPE ON ALL PIPE THREADS

NO.	ALTERATION	DATE	CHG. BY
F	ITEM #11 WAS 1555200 QTY (1); CORRECTED ITEM #7; UPDATED BORDER	8/30/12	JSH
E	P.N. WAS 1555001 FOR ITEM 6	06/18/09	ATB
D	QTY OF ITEM '10' WAS .25	2/29/08	JSH
C	CORRECTED BALLOONS	7/1/02	DLC
B	FLUSH WATER WAS 10 GPH	04/22/02	LFXXXXX
A	MOVED GAUGE	04/21/00	LFXXXXX
–	RELEASED TO PRODUCTION	10/29/93	LF12565

FILE#: L:\PROJECTS\PROD4 | DRAWN BY: FSK

FELDMEIER EQUIPMENT
575 E. Mill Street
Little Falls, NY 13365

SCALE:NONE | ENGRG. Approved By | AI | REV F
DATE: 10/29/93 | SHEET: 1 of 1

FLUSH ACCESSORIES RAPIDMIXER WITH DOUBLE SEAL

DRAWING NO. 4030280

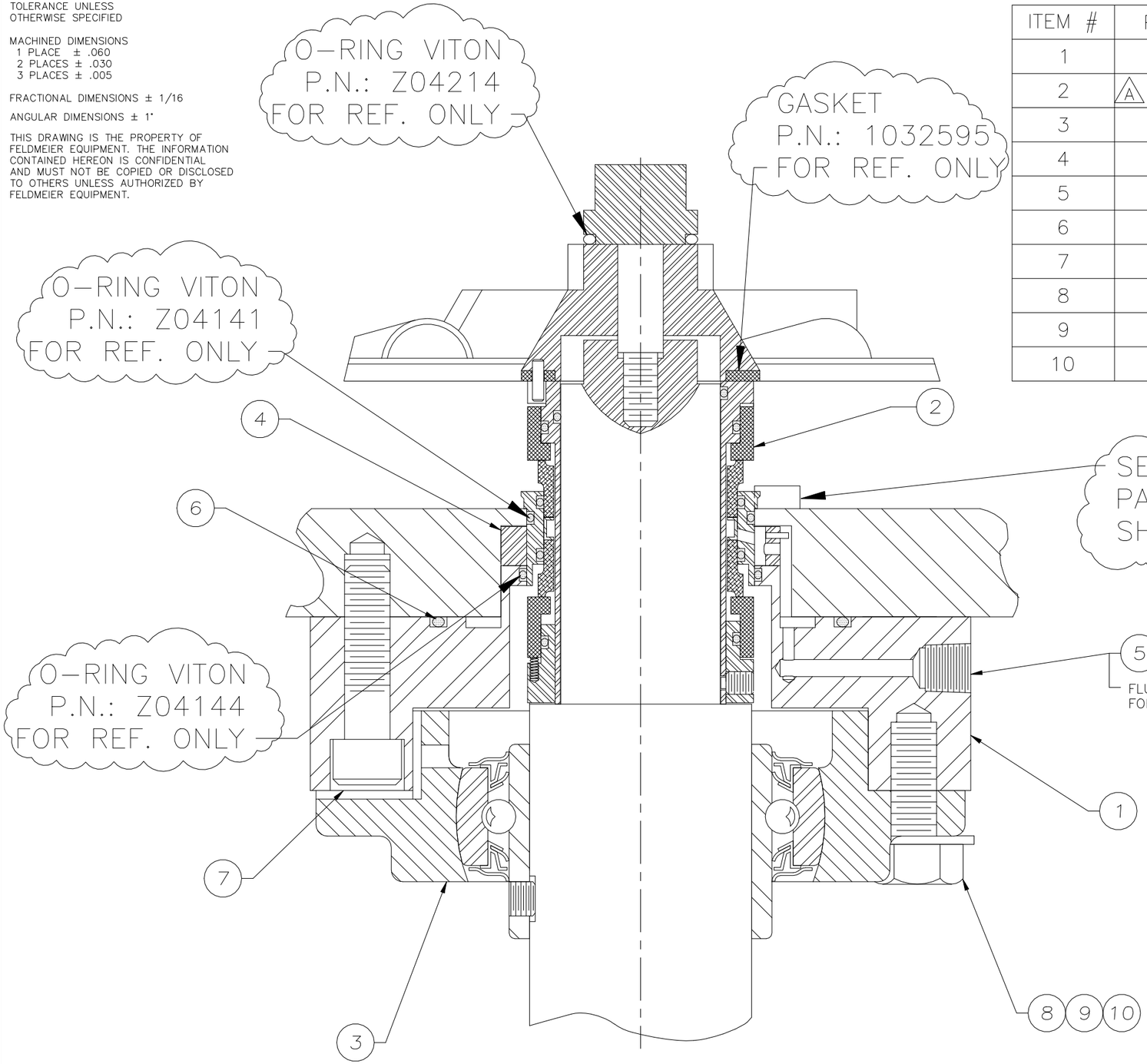
TOLERANCE UNLESS
OTHERWISE SPECIFIED

MACHINED DIMENSIONS
1 PLACE ± .060
2 PLACES ± .030
3 PLACES ± .005

FRACTIONAL DIMENSIONS ± 1/16

ANGULAR DIMENSIONS ± 1°

ITEM #	PART NUMBER	QTY	DESCRIPTION
1	6025746	1	SEAL GLAND, SINGLE/DOUBLE SEAL
2	(A) SEE B.O.M.	1	MECHANICAL SEAL, 1-3/4"
3	1034215	1	UPPER BEARING, 2-7/16"
4	1036889	1	FLOW CHANNEL, DOUBLE SEAL
5	4030280	1	FLUSH ACCESSORIES, DBL SEAL
6	1554520	1	'O'-RING, #244, VITON
7	1952089	4	SCR-CAP SH 1/2-13 X 1-3/4" LG
8	1952009	4	SCR-CAP HH 1/2-13 X 1-3/4" LG
9	1957209	4	WASHER - LOCK, 1/2"
10	1957009	4	WASHER - FLAT, 1/2"



NOTE: CAN BE CONVERTED TO SINGLE SEAL SEE DRAWING 2501752

Drawing No.
6024365

NOTE: CAD DRAWING DO NOT CHANGE MANUALLY

NO.	ALTERATION	DATE	CHANGE SH. NO.
G			
F			
E			
D			
C			
B			
A	ITEM # 2 WAS CHESTERTON 155/42/13	10/03/96	LF12903
–	RELEASED TO PRODUCTION		JSH

	BY	DATE
DR.	FSK	10/09/96
RC.		
AP.		

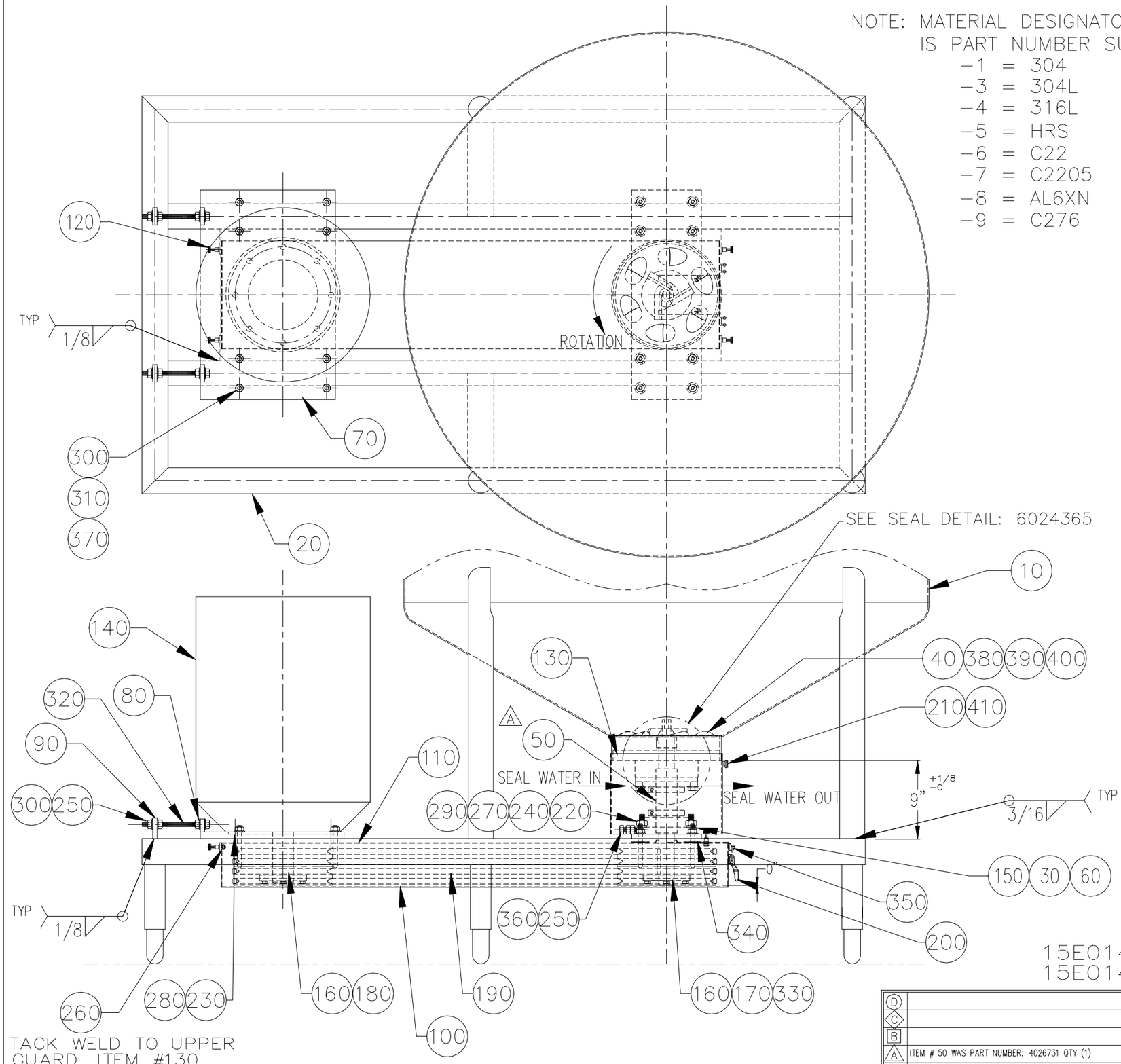
SCALE: 1"=1"

FELDMEIER EQUIPMENT
575 E.MILL STREET
LITTLE FALLS, NY 13365

MATERIAL DESCRIPTION

SEAL DETAIL
DOUBLE SEAL
RAPIDMIXER

6024365



ITEM #	PART NUMBER	QTY	DESCRIPTION
10	SEE MAT'L LIST	1	BASIC TANK ASSEMBLY
20	SEE MAT'L LIST	1	FRAME ASSEMBLY
30	1034539	1	SLINGER – LOWER BEARING
40	8009423	1	IMPELLER 12" RAPID MIXER
A 50	CD34886	1	DRIVE SHAFT EXTENDED
60	4029592	1	BEARING PLATE, 2-7/16" SIZE
70	SEE MAT'L LIST	1	MOTOR PLATE
80	1032605	2	TENSION LUG – THREADED
90	1032604	2	TENSION LUG
100	CD34815	1	BELT GUARD – UPPER
110	CD34816	1	BELT GUARD – LOWER
120	1033598	4	GUARD MOUNTING LUG
130	4029794	1	SHAFT GUARD ASSEMBLY
140	SEE MAT'L LIST	1	MOTOR 'C' FACE
150	1034216	1	BEARING–LOWER, 2-7/16" STANDARD
160	1412894	1	SHEAVE BROWNING 4B11.0
170	1412895	1	BUSHING, R1 X 1-7/8"
180	SEE MAT'L LIST	1	BUSHING, R1 X 2-3/8"
190	1417440	4	V-BELT, BX120 (123" OUTSIDE)
200	1959025	3	CLAMP, DE-STA-CO, #323-SS
210	1959032	1	DZUS FASTENER TL803B-SS
220	1952053	8	SCREW-CAP HH, 5/8-11 X 2" LG
230	SEE MAT'L LIST	8	SCREW-CAP HH
240	1951011	4	NUT – HEX, 5/8-11
250	1951009	9	NUT – HEX, 1/2-13
260	1951005	4	NUT – HEX, 1/4-20
270	1957211	4	WASHER – LOCK, 5/8"
280	SEE MAT'L LIST	8	WASHER – LOCK
290	1957011	4	WASHER – FLAT, 5/8"
300	1957009	22	WASHER – FLAT, 1/2"
310	1959035	8	U-BOLT, 2-1/2" PIPE SIZE
320	1034540	2	ROD – THREADED, 1/2-13 X 8" LG
330	1034541	1	KEYSTOCK, 1/2" SQ. X 2" LG
340	9080007	8	SILICONE STRIPPING X 1" LG PC
350	4029813	1	SLOT COVER – UPPER BELT GUARD
360	1952003	1	SCREW-CAP HH, 1/2-13 X 1-1/2" LG
370	1951202	16	NUT, ACORN 1/2-13 SS
380	1032592	1	RETAINER–IMPELLER
390	1032595	1	GASKET–IMPELLER
400	Z04214	1	O-RING #214 VITON
410	1959032S	1	DZUS STRIKE TL800-7
–	–	–	–

NOTES:

1) SEE FINAL ASSEMBLY DRAWING FOR ORIENTATION OF BASIC TANK AND OUTLET ORIENTATION
2) USE ALIGNMENT TOOL TO LOCATE BEARINGS
3) APPLY ANTI-SEIZE COMPOUND TO INNER RACE OF BOTH BEARINGS, PILOT SURFACE OF UPPER BEARING, AND INSIDE OF BOTH SHEAVE BUSHINGS.

15E0140
15E0141

NO.	ALTERATION	DATE	CHG. BY
D			
C			
B			
A	ITEM # 50 WAS PART NUMBER: 4026731 QTY (1)	6/24/15	JSH

FILE#: L:\PROJECTS\CD34 | DRAWN BY: JSH

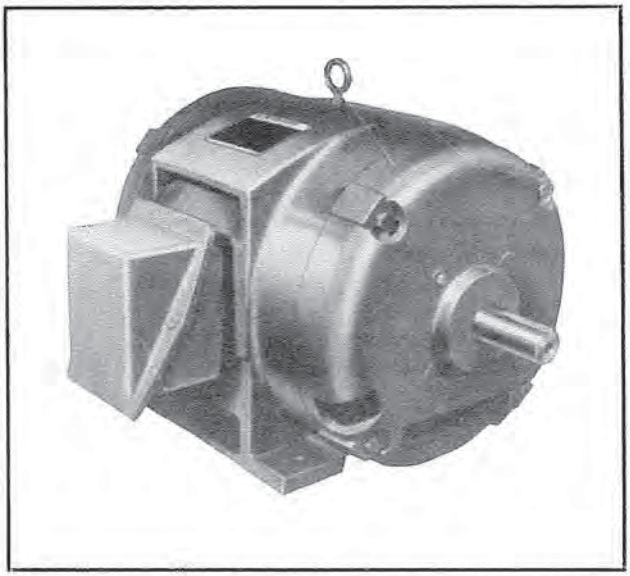
FELDMEIER EQUIPMENT
575 E. Mill Street
Little Falls, NY 13365

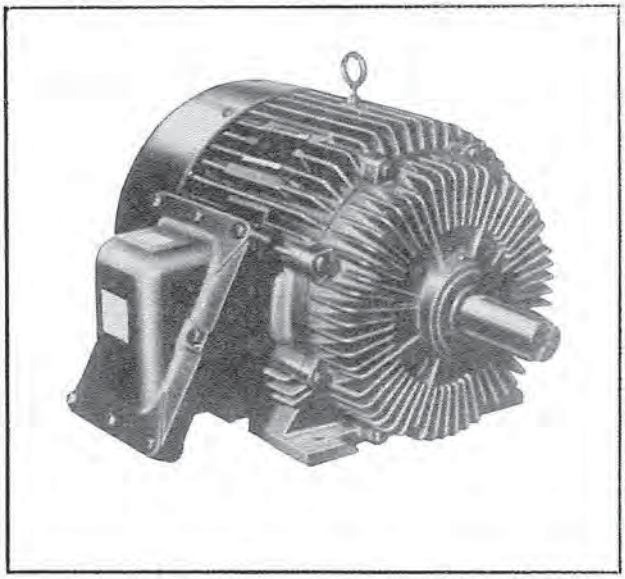
SCALE:NONE | ENGRG. Approved By | AI | REV A
DATE: 4/21/15 | SHEET: 1 of 1

AGITATION DETAILS BELT DRIVE
RAPID MIXER WITH STANDARD BEARINGS

DRAWING NO. CD34811

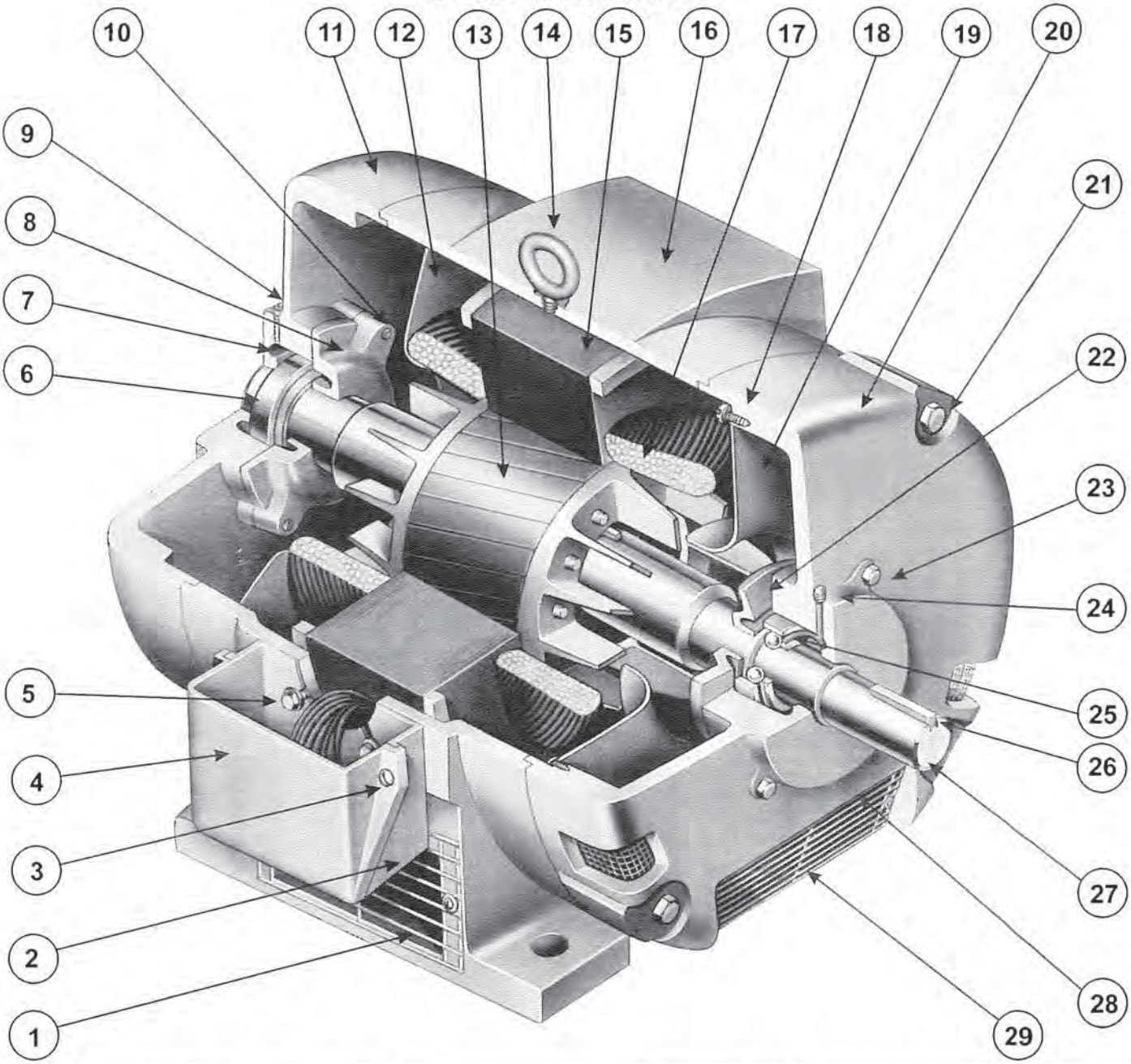
Standard Induction Motors





Installation, Operation, & Maintenance Instructions

TYPICAL CUTAWAY VIEW OF A DRIPPROOF, HORIZONTAL INTEGRAL HORSEPOWER MOTOR & PARTS DESCRIPTION 364 THRU 445 FRAME SIZE



ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	** Frame Vent Screen	11.	Bracket O.P.E.	21.	Bracket Holding Bolt
2.	Conduit Box Bottom	12.	Baffle Plate O.P.E.	22.	Inner Bearing Cap P.E.
3.	Conduit Box Top-Holding Screw	13.	Rotor Core	23.	Inner Bearing Cap Bolt
4.	Conduit Box Top	14.	Lifting Eye Bolt	24.	Grease Plug
5.	Conduit Box Bottom-Holding Bolt	15.	Stator Core	25.	*Ball Bearing P.E.
6.	*Ball Bearing O.P.E.	16.	Frame	26.	Shaft Extension Key
7.	Pre-loading Spring	17.	Stator Winding	27.	Shaft
8.	Inner Bearing Cap O.P.E.	18.	Baffle Plate Holding Screw	28.	Drain Plug (grease)
9.	Grease Plug	19.	Baffle Plate P.E.	29.	**Bracket Screen
10.	Inner Bearing Cap Bolt	20.	Bracket P.E.		

P.E. = Pulley End

O.P.E. = Opposite Pulley End

* = Bearing Numbers are shown on motor nameplate when requesting information or parts always give complete motor description, model and serial numbers.

** = Bracket and frame screens are optional.

WARNING

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the motor. They should be brought to the attention of all persons who install, operate or maintain this equipment.

GENERAL INFORMATION

Motors are all fully factory tested and inspected before shipping. Damage during shipment and storage can occur. Motors not correctly matched to the power supply and/or the load will not operate properly. These instructions are intended as a guide to identify and eliminate these problems before they are overlooked or cause further damage.

ACCEPTANCE

Check carefully for any damage that may have occurred in transit. If any damage or shortage is discovered, do not accept until an appropriate notation on the freight bill is made. Any damage discovered after receipt of equipment should be immediately reported to the carrier.

STORAGE

A. Keep motors clean
   1. Store indoors
   2. Keep covered to eliminate airborne dust and dirt.
   3. Cover openings for ventilation, conduit connections, etc. to prevent entry of rodents, snakes, birds, and insects, etc.

B. Keep motors dry
   1. Store in a dry area indoors
   2. Temperature swings should be minimal to prevent condensation.
   3. Space heaters are recommended to prevent condensation.
   4. Treat unpainted flanges, shafts, and fittings with a rust inhibitor.
   5. Check insulation resistance before putting motor into service. (Consult manufacturer for guidelines).

C. Keep Bearings Lubricated
   1. Once per month, rotate shaft several turns to distribute grease in bearings.
   2. If unit has been stored more than one year, add grease before start-up. (Refer to lubrication procedure).

INSTALLATION

UNCRATING AND INSPECTION

After uncrating, check for any damage which may have been incurred in handling. The motor shaft should turn freely by hand. Repair or replace any loose or broken parts before attempting to use the motor.

Check to be sure that motor has not been exposed to dirt, grit, or excessive moisture in shipment or storage before installation.

Measure insulation resistance (see operation). Clean and dry the windings as required.

Never start a motor which has been wet without having it thoroughly dried.

SAFETY

Motors should be installed, protected and fused in accordance with latest issue of National Electrical Code, NEMA Standard Publication No. MG 2 and local codes.

Eyebolts or lifting lugs are intended for lifting the motor only. These lifting provisions should never be used when lifting or handling the motor with other equipment (i.e. pumps, gear boxes, fans or other driven equipment) as a single unit. Be sure the eyebolt is fully threaded and tight in its mounting hole.

Eyebolt lifting capacity ratings is based on a lifting alignment coincident with the eyebolt centerline. Eyebolt capacity reduces as deviation from this alignment increases. See NEMA MG 2.

Frames and accessories of motors should be grounded in accordance with National Electrical Code (NEC) Article 430. For general information of grounding refer to NEC Article 250.

Rotating parts such as pulleys, couplings, external fans, and shaft extensions should be permanently guarded.

LOCATION

In selecting a location for the motor, consideration should be given to environment and ventilation. A motor with the proper enclosure for the expected operating condition should be selected.

The ambient temperature of the air surrounding the motor should not exceed 40° C (104° F) unless the motor has been especially designed for high ambient temperature applications. The free flow of air around the motor should not be obstructed.

The motor should never be placed in a room with a hazardous process, or where flammable gases or combustible material may be present, unless it is specifically designed for this type of service.

1. Dripproof (open) motors are intended for use indoors where atmosphere is relatively clean, dry and non-corrosive.
2. Totally enclosed motors may be installed where dirt, moisture and corrosion are present, or in outdoor locations.
3. Explosion proof motors are built for use in hazardous locations as indicated by Underwriters' label on motor. Consult UL, NEC, and local codes for guidance.

Refer to manufacturer for application assistance.

FLOOR MOUNTING

Motors should be provided with a firm, rigid foundation, with the plane of four mounting pads flat within .010" for 56 to 210 frame; .015" from 250 through 500 frame. This may be accomplished by shims under the motor feet. For special isolation mounting, contact manufacturer for assistance.

V-BELT DRIVE

1. Select proper type and number of belts and sheaves. Excessive belt load will damage bearings. Sheaves should be in accordance to NEMA Spec. MG-1 or as approved by the manufacturer for a specific application.
2. Align sheaves carefully to avoid axial thrust on motor bearing. The drive sheave on the motor should be positioned toward the motor so it is as close as possible to the bearing.

3. When adjusting belt tension, make sure the motor is secured by all mounting bolts before tightening belts.
4. Adjust belt tension to belt manufacturers recommendations. Excessive tension will decrease bearing life.
5. For more information see Marathon Electric Publication SB528.

DIRECT CONNECTED DRIVE

Flexible or solid shaft couplings must be properly aligned for satisfactory operation. On flexible couplings, the clearance between the ends of the shafts should be in accordance with the coupling manufacturer's recommendations or NEMA standards for end play and limited travel in coupling.

MISALIGNMENT and RUN-OUT between direct connected shafts will cause increased bearing loads and vibration even when the connection is made by means of a flexible coupling. Excessive misalignment will decrease bearing life. Proper alignment, per the specifications of the coupling being used, is critical.

Some large motors are furnished with roller bearings. Roller bearings should **not** be used for direct drive.

ELECTRICAL CONNECTIONS

CAUTION

Install and ground per local and national codes. Consult qualified personnel with questions or if repairs are required.

WARNING

1. Disconnect power before working on motor or driven equipment.
2. Motors with automatic thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
3. Motors with manual thermal protectors may start unexpectedly after protector trips. If manual protector trips, disconnect motor from power line. After protector cools (five minutes or more) it can be reset and power may be applied to motor.
4. Discharge all capacitors before servicing motor.
5. Always keep hands and clothing away from moving parts.
6. Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, imbedded detector, or thermocouple.
7. Electrical repairs should be performed by trained and qualified personnel only.
8. Failure to follow instructions and safe electrical procedures could result in serious injury or death.
9. If safety guards are required, be sure the guards are in use.

1. All wiring, fusing, and grounding must comply with National Electrical Codes and local codes.
2. To determine proper wiring, rotation and voltage connections, refer to the information and diagram on the nameplate, separate connection plate or decal. If the plate or decal has been removed, contact Marathon Electric for assistance.
3. Use the proper size of line current protection and motor controls as required by the National Electrical Code and local codes. Recommended use is 125% of full load amps as shown on the nameplate for motors with 40°C ambient and a service factor over 1.0. Recommended use is 115% of full load amps as shown on the nameplate for all other motors. Do not use protection with larger capacities than recommended. Three phase motors must have all three phases protected.

THERMAL PROTECTOR INFORMATION

The nameplate will indicate one of the following:

1. Motor is thermally protected
2. Motor is not thermally protected
3. Motor is provided with overheat protective device

For examples, refer to paragraphs below:

1. Motors equipped with built-in thermal protection have "THERMALLY PROTECTED" stamped on the nameplate. Thermal protectors open the motor circuit electrically when the motor overheats or is overloaded.
   The protector cannot be reset until the motor cools. If the protector is automatic, it will reset itself. If the protector is manual, press the red button to reset.
2. Motors without thermal protection have nothing stamped on nameplate about thermal protection.
3. Motors that are provided with overheat protective device that does not open the motor circuit directly will indicate "WITH OVERHEAT PROTECTIVE DEVICE".
   A. Motors with this type of "Overheat Protective Device" have protector leads brought out in the motor conduit box marked "P1" and "P2". These leads are intended for connection in series with the stop button of the 3-wire pilot circuit for the magnetic starter which controls the motor. See Figure 1.
   B. The circuit controlled by the above "Overheat Protective Device" must be limited to a maximum of 600 volts and 360 volt-amps.

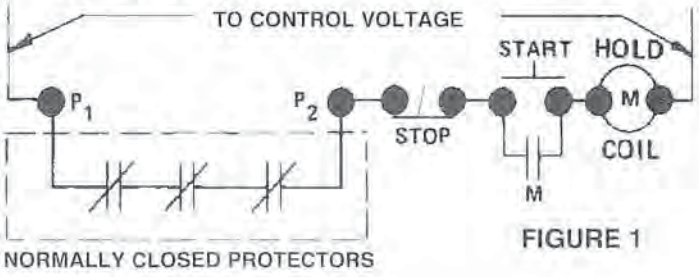
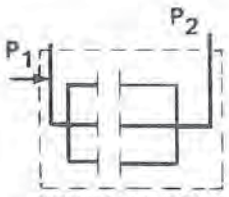


FIGURE 1



Normally Open (N/O) Motor Thermostats may be used in conjunction with controls installed by Original Equipment Manufacturers.

FIGURE 1A

CHANGING ROTATION

1. Keep hands and clothing away from rotating parts.
2. Before the motor is coupled to the load, determine proper rotation.
3. Check rotation by jogging or bumping. Apply power to the motor leads for a short period of time, enough to just get motor shaft to rotate a slight amount to observe shaft rotating direction.
4. Three phase - interchange any two (2) of the three (3) line leads. Single phase - reconnect per the connection diagram on the motor.

REDUCED VOLTAGE STARTING

Motors used on reduced voltage starting, should be carefully selected based upon power supply limitations and driven load requirements. The motors starting torque will be reduced when using reduced voltage starting. The elapsed time on the start step should be kept as short as possible and should not exceed 5 seconds. It is recommended that this time be limited to 2 seconds. Refer to Marathon Electric for application assistance.

OPERATION

WARNING

Disconnect and lock out before working on motor or driven equipment.

BEFORE INITIAL STARTING

1. If a motor has become damp in shipment or in storage, measure the insulation resistance of the stator winding.

$$\text{Minimum Insulation Resistance In Megohms} = 1 + \frac{\text{Rated Voltage}}{1000}$$

Do not attempt to run the motor if the insulation resistance is below this value.

2. If insulation resistance is low, dry out the moisture in one of the following ways:
   a. Bake in oven at temperature not more than 90°C (194°F).
   b. Enclose motor with canvas or similar covering, leaving a hole at the top for moisture to escape, and insert heating units or lamps.
   c. Pass a current at low voltage (rotor locked) through the stator winding. Increase the current gradually until the winding temperature, measured with a thermometer, reaches 90°C (194°F). Do not exceed this temperature.
3. See that voltage and frequency stamped on motor and control nameplates correspond with that of the power line.
4. Check all connections to the motor and control with the wiring diagram.
5. Be sure rotor turns freely when disconnected from the load. Any foreign matter in the air gap should be removed.
6. Leave the motor disconnected from the load for the initial start (see following caution). Check for proper rotation. Check for correct voltage (within ± 10% of nameplate value) and that it is balanced within 1% at the motor terminals. After the machine is coupled to the load, check that the nameplate amps are not exceeded. Recheck the voltage level and balance under load per the above guidelines.

   Shut down the motor if the above parameters are not met or if any other noise or vibration disturbances are present. Consult NEMA guidelines or the equipment manufacturer if any questions exist before operating equipment.

CAUTION

For motors nameplated as "belted duty only", do not run motor without belts properly installed.

COLLECTOR RINGS (Wound Rotor Motors Only)

The collector rings are sometimes treated at the factory to protect them while in stock and during shipment. The brushes have been fastened in a raised position. Before putting the motor into service, the collector rings should be cleaned to remove this treatment. Use a cleaning fluid that is made for degreasing electrical equipment. All of the brushes must be released and lowered to the collector surface. Keep the rings clean and maintain their polished surfaces. Ordinarily, the rings will require only occasional wiping with a piece of canvas or non-linting cloth. Do not let dust or dirt accumulate between the collector rings.

BRUSHES (Wound Rotor Motors Only)

See that the brushes move freely in the holders and at the same time make firm, even contact with the collector rings. The pressure should be between 2 and 3 pounds per square inch of brush surface.

When installing new brushes, fit them carefully to the collector rings. Be sure that the copper pigtail conductors are securely fastened to, and make good contact with, the brushholders.

ALLOWABLE VOLTAGE AND FREQUENCY RANGE

If voltage and frequency are within the following range, motors will operate, but with somewhat different characteristics than obtained with correct nameplate values.

1. Voltage: Within 10% above or below the value stamped on the nameplate. On three phase systems the voltage should be balanced within 1%. A small voltage unbalance will cause a significant current unbalance.
2. Frequency: Within 5% above or below the value stamped on the nameplate.
3. Voltage and Frequency together: Within 10% (providing frequency above is less than 5%) above or below values stamped on the nameplate.

CLEANLINESS

Keep both the interior and exterior of the motor free from dirt, water, oil and grease. Motors operating in dirty places should be periodically disassembled and thoroughly cleaned.

CONDENSATION DRAIN PLUGS

All explosion proof and some totally enclosed motors are equipped with automatic drain plugs, they should be free of oil, grease, paint, grit and dirt so they don't clog up. The drain system is designed for normal floor (feet down) mounting. For other mounting positions, modification of the drain system may be required, consult Marathon Electric.

SERVICE

WARNING

Disconnect power before working on motor or driven equipment. Motors with automatic thermal protectors will automatically restart when the protector cools. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.

CAUTION

Overgreasing bearings can cause premature bearing and/or motor failure. The amount of grease added should be carefully controlled.

NOTE

If lubrication instructions are shown on the motor nameplate, they will supersede this general instruction.

Motors are pregreased with a polyurea mineral oil NGLI grade 2 type grease unless stated otherwise on the motor nameplate. Some compatible brands of polyurea mineral base type grease are: Chevron SRI #2, Rykon Premium #2, Exxon Polyrex EM or Texaco Polystar RB.

Motors are properly lubricated at the time of manufacture. It is not necessary to lubricate at the time of installation unless the motor has been in storage for a period of 12 months or longer (refer to lubrication procedure that follows).

LUBRICATION PROCEDURES

1. Stop motor. Disconnect and lock out of service.
2. Remove contaminants from grease inlet area.
3. Remove filler and drain plugs.
4. Check filler and drain holes for blockage and clean as necessary.
5. Add proper type and amount of grease. See the Relubrication Time Intervals table for service schedule and Relubrication Amounts table for volume of grease required.
6. Wipe off excess grease and replace filler and drain plugs (see following warning).
7. Motor is ready for operation.

WARNING

If motor is nameplated for hazardous locations, do not run motor without all of the grease or drain plugs installed.

RELUBRICATION TIME INTERVAL AND AMOUNTS

(For motors with regreasing provisions).

Service Condition	NEMA FRAME SIZE					
	140-180		210-360		400-510	
	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM
Standard	3 yrs.	6 months	2 yrs.	6 months	1 yr.	3 months
Severe	1 yr.	3 months	1 yr.	3 months	6 months	1 month
Seasonal	See Note 2.					

NOTE

1. For motors nameplated as "belted duty only" divide the above intervals by 3.
2. Lubricate at the beginning of the season. Then follow service schedule above.

SEASONAL SERVICE: The motor remains idle for a period of 6 months or more.

STANDARD SERVICE: Up to 16 hours of operation per day, indoors, 100°F maximum ambient.

SEVERE SERVICE: Greater than 16 hours of operation per day. Continuous operation under high ambient temperatures (100° to 150°F) and/or any of the following: dirty, moist locations, high vibration (above NEMA standards), heavy shock loading, or where shaft extension end is hot.

RELUBRICATION AMOUNTS

(For motors with regreasing provisions).

NEMA FRAME SIZE	VOLUME cu. in. (fluid oz.)
140	.25 (.14)
180	.50 (.28)
210	.75 (.42)
250	1.00 (.55)
280	1.25 (.69)
320	1.50 (.83)
360	1.75 (.97)
400	2.25 (1.2)
440	2.75 (1.5)
500	3.00 (1.7)

TROUBLESHOOTING

WARNING

1. Disconnect power before working on motor or driven equipment.
2. Motors with automatic thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
3. Motors with manual thermal protectors may start unexpectedly after protector trips. If manual protector trips, disconnect motor from power line. After protector cools (five minutes or more) it can be reset and power may be applied to motor.
4. Discharge all capacitors before servicing motor.
5. Always keep hands and clothing away from moving parts.
6. Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, imbedded detector, or thermocouple.
7. Electrical repairs should be performed by trained and qualified personnel only.
8. Failure to follow instructions and safe electrical procedures could result in serious injury or death.
9. If safety guards are required, be sure the guards are in use.

If trouble is experienced in the operation of the motor, make sure that:

1. The bearings are in good condition and operating properly.
2. There is no mechanical obstruction to prevent rotation in the motor or in the driven load.
3. The air gap is uniform. (Consult manufacturer for specifications).
4. All bolts and nuts are tightened securely.
5. Proper connection to drive machine or load has been made.

In checking for electrical troubles, be sure that:

1. The line voltage and frequency correspond to the voltage and frequency stamped on the nameplate of the motor.
2. The voltage is actually available at motor terminals.
3. The fuses and other protective devices are in proper condition.
4. All connections and contacts are properly made in the circuits between the control apparatus and motor.

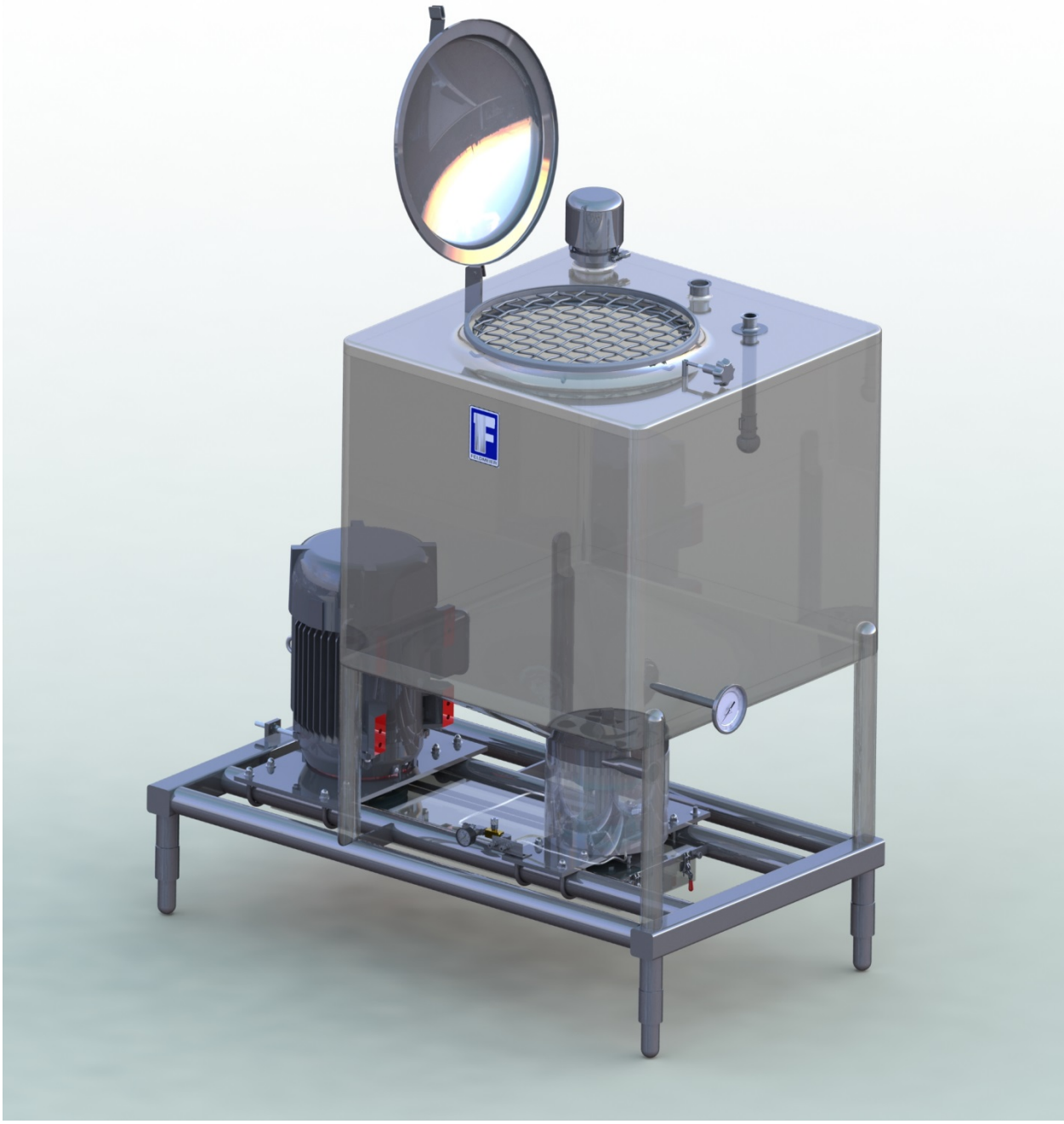
These instructions do not cover all details or variations in equipment nor provide for every possible condition to be met in connection with installation, operation or maintenance. Should additional information be desired for the purchaser's purposes, the matter should be referred to the manufacturer.

MOTOR TROUBLE SHOOTING CHART

Your motor service and any trouble shooting must be handled by qualified persons who have proper tools and equipment.

TROUBLE	CAUSE	WHAT TO DO
Motor fails to start	Blown fuses	Replace fuses with proper type and rating
	Overload trips	Check and reset overload in starter.
	Improper power supply	Check to see that power supplied agrees with motor nameplate and load factor.
	Improper line connections	Check connections with diagram supplied with motor.
	Open circuit in winding or control switch	Indicated by humming sound when switch is closed. Check for loose wiring connections. Also see that all control contacts are closing.
	Mechanical failure	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator	Indicated by blown fuses. Motor must be rewound.
	Poor stator coil connection	Remove end bells, locate with test lamp.
	Rotor defective	Look for broken bars or end rings.
	Motor may be overloaded	Reduce load.
Motor stalls	One phase may be open	Check lines for open phase.
	Wrong application	Change type or size. Consult manufacturer.
	Overload	Reduce load.
	Low voltage	See that nameplate voltage is maintained. Check connection
	Open circuit	Fuses blown, check overload relay, stator and pushbuttons.
Motor runs and then dies down	Power failure	Check for loose connections to line, to fuses and to control.
Motor does not come up to speed	Not applied properly	Consult supplier for proper type.
	Voltage too low at motor terminals because of line drop.	Use higher voltage on transformer terminals or reduce load. Check connections. Check conductors for proper size
	Starting load too high	Check load motor is supposed to carry at start.
	Broken rotor bars or loose rotor	Look for cracks near the rings. A new rotor may be required as repairs are usually temporary.
	Open primary circuit	Locate fault with testing device and repair.
Motor takes too long to accelerate and/or draws high amp	Excessive load	Reduce load.
	Low voltage during start	Check for high resistance. Adequate wire size.
	Defective squirrel cage rotor	Replace with new rotor.
	Applied voltage too low	Get power company to increase power tap.
Wrong rotation	Wrong sequence of phases	Reverse connections at motor or at switchboard.
Motor overheats while running under load	Overload	Reduce load.
	Frame or bracket vents may be clogged with dirt and prevent proper ventialation of motor.	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open	Check to make sure that all leads are well connected.
	Grounded coil	Locate and repair.
	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
Motor vibrates	Motor misaligned	Realign.
	Weak support	Strengthen base
	Coupling out of balance	Balance coupling.
	Driven equipment unbalanced	Rebalance driven equipment.
	Defective bearings	Replace bearing.
	Bearings not in line	Line up properly.
	Balancing weights shifted	Rebalance motor.
	Polyphase motor running single phase	Check for open circuit.
	Excessive end play	Adjust bearing or add shim.
Unbalanced line current on polyphase motors during normal operation	Unequal terminal volts	Check leads and connections.
	Single phase operation	Check for open contacts.
	Unbalanced voltage	Correct unbalanced power supply.
Scraping noise	Fan rubbing air shield	Remove interference.
	Fan striking insulation	Clear fan.
	Loose on bedplate	Tighten holding bolts.
Noisy operation	Airgap not uniform	Check and correct bracket fits or bearing.
	Rotor unbalance	Rebalance.
Hot bearings general	Bent or sprung shaft	Straighten or replace shaft.
	Excessive belt pull	Decrease belt tension.
	Pulleys too far away	Move pulley closer to motor bearing.
	Pulley diameter too small.	Use larger pulleys.
	Misalignment	Correct by realignment of drive.
Hot bearings ball	Insufficient grease	Maintain proper quantity of grease in bearing.
	Deterioration of grease or lubircant contaminated	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant	Reduce quantity of grease, bearing should not be more than 1/2 filled.
	Overloaded bearing	Check alignment, side and end thrust.
	Broken ball or rough races	Replace bearing, first clean housing thoroughly.

FELDMEIER RAPIDMIXER



FELDMEIER EQUIPMENT, INC.

LOCATIONS
SYRACUSE, NY | LITTLE FALLS, NY | SHELL ROCK, IA | MONTGOMERY, AL | FERNLEY, NV | CANADA

CAUTION!

This equipment contains moving / rotating parts.

Disconnect all power supplies before performing any service or inspection.

Guards are to be left in place during operation.

Prior to service, ALL equipment is subject to

Lock-Out or Tag-Out procedures

per your facility requirements.

Inspection at Receipt

This equipment has received a careful final inspection. It has been packaged securely to ensure delivery without damage or loss of any parts. At the time of delivery, please inspect the equipment for any visual damage or shortage. If damage or shortage has occurred, record on freight bill accordingly and have the driver sign. Unpack the equipment as soon as possible, and if you find concealed damage, hold all packaging material and call delivering carrier for inspection and to fill out inspection report (furnished by the transportation company). Then file a claim with the transportation company. They are responsible for any damage that may have occurred in shipment. For our records, we will appreciate your advising us of any damage or loss claims you file so we may assist you in every way.

Please feel free to contact the Feldmeier Equipment parts & service department if there are any questions regarding this equipment or operation.
1-800-258-0118

RAPIDMIXER OPERATING INSTRUCTIONS

The following instructions must be read and referred to prior to operating the Feldmeier Equipment Rapidmixer, and referred to during any future maintenance functions.

Note: These instructions include diagrams for the current design revision of the Rapidmixer. For older equipment, some details may not apply. Both Chesterton and the ASI seal details have been included, refer to the original manual supplied with older equipment to determine which detail is applicable. Both seals are fully interchangeable when purchased complete. Rebuild parts kits are available for both which contain all the parts to fully rebuild the seal to an as new condition.

Please feel free to contact the Feldmeier Equipment parts & service department if there are any questions regarding this equipment or operation.
1-800-258-0118

CAUTION:
ENSURE ALL POWER IS DISCONNECTED FROM THE UNIT PRIOR TO PERFORMING ANY OF THE FOLLOWING TASKS.

PREPARE TO INSTALL:

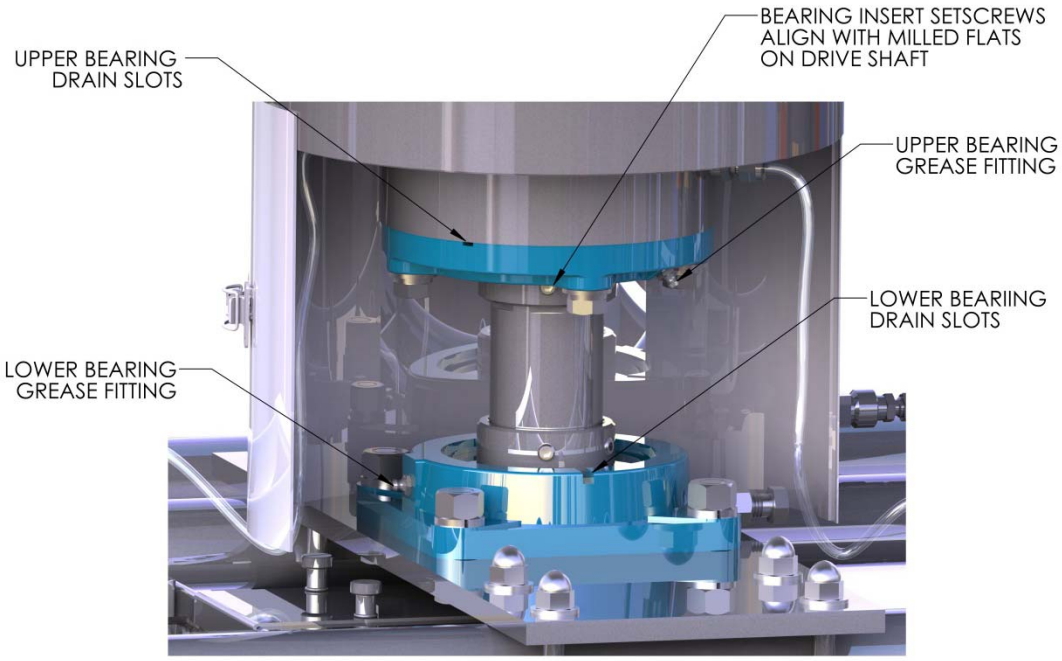
The mixer has been shipped complete and tested at the factory. Unpack all documentation and the Alignment Tool which is shipped loose, and keep in a safe place.

Level the machine by adjusting the feet before starting the equipment.

Wire the motor in accordance with the motor manufacturers wiring diagram included in this manual. After wiring the motor, check that the impeller is rotating in the Counter-Clockwise direction when viewed from the top of the machine.

NOTE: IT IS OF PARAMOUNT IMPORTANCE THAT THE SEAL FLUSH BE CONNECTED AND THE SEAL WATER BE FLOWING THROUGH THE SEAL DURING OPERATION. RAPID SEAL FAILURE WILL OCCUR IF THE SEAL IS RUN DRY!

Bearing Maintenance



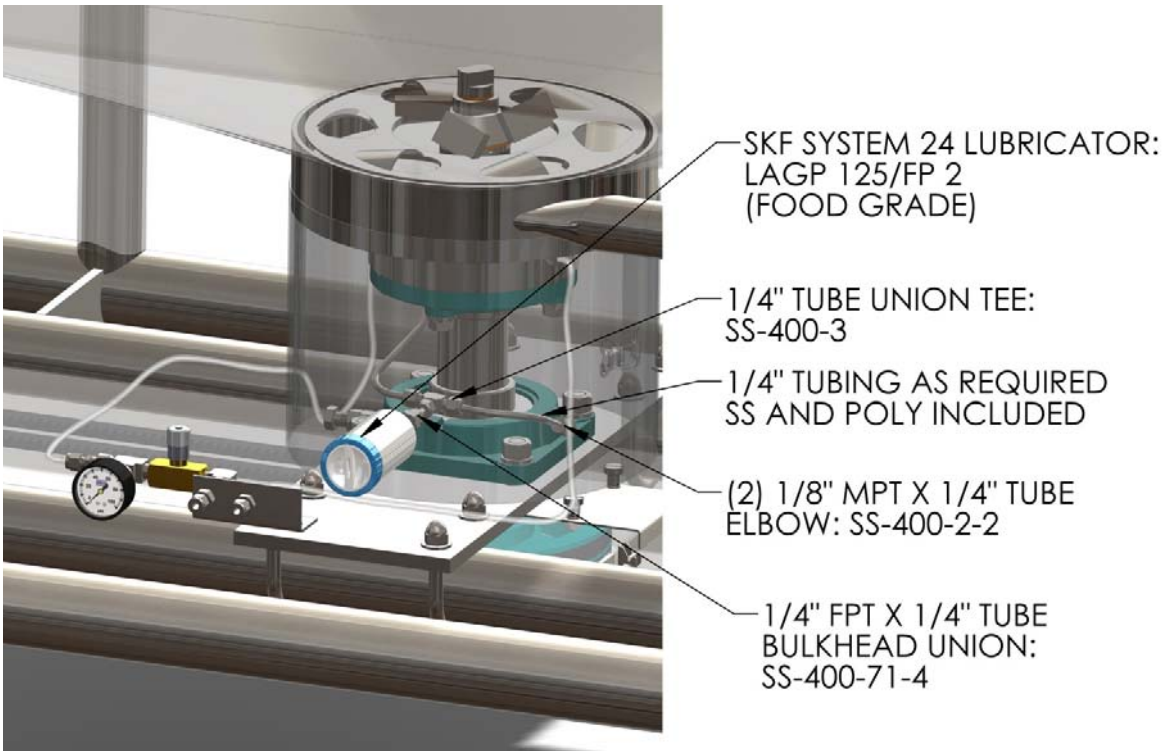
It is crucial for long service life of the Rapidmixer to keep the bearings properly lubricated and properly mounted. The bearings must sit flat on the mounting surfaces with no visible gaps. The proper mounting bolt torque is 37 ft-lbs for the upper bearing (1/2”) and 92 ft-lbs for the lower bearing (5/8”). The bearing insert setscrews should be aligned with the flats on the drive shaft and tightened to a torque of 18-23 ft-lbs. It is recommended to periodically inspect the drainage slots to be sure they are free of debris and excess grease.

Lubrication

Because of the high speed of the Rapidmixer, too much grease in the bearings may cause overheating. If this occurs, it may be necessary to remove the grease fitting to let the excess grease escape. It is recommended to add a small amount of grease at frequent intervals rather than a large amount of grease at longer intervals. Use a NLGI 2 grade grease such as Bel-Ray #62570 or equivalent which is certified as H1 for incidental food contact.

	Suggested Lubrication Period in Weeks				
Hours Run per Day	**751-1000 RPM**	**1001-1500 RPM**	**1501-2000 RPM**	**2001-2500 RPM**	**2501-3000 RPM**
8	7	5	4	3	2
16	4	2	2	1	1
24	2	1	1	1	1

AutoLube Accessory Package

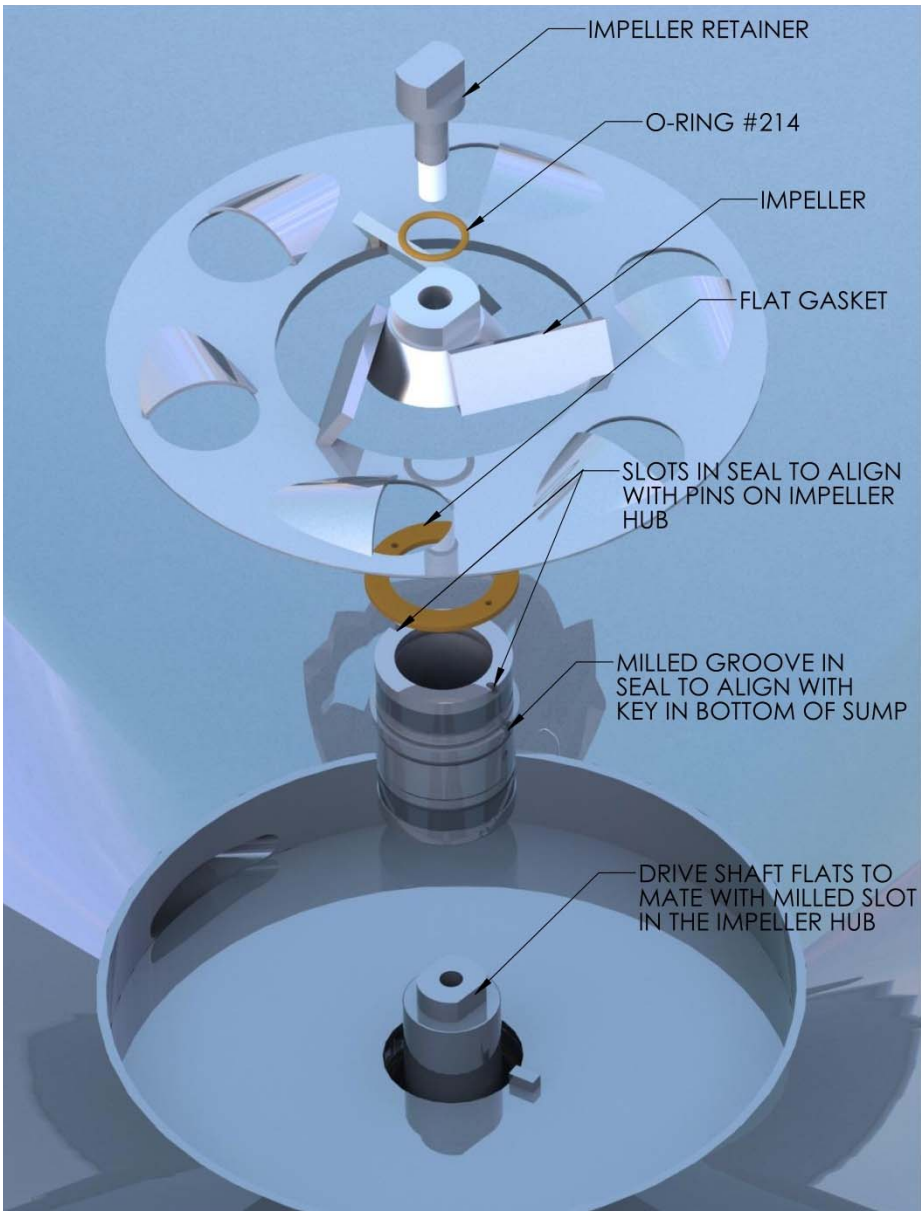


AUTOLUBE INSTALLATION

For locations where the Bearings are not easily accessible or for ease of maintenance, Feldmeier Equipment offers the automatic lubrication package that may be installed on the Rapidmixer. All required components are included in the package.

1) Cut a 1/2” diameter hole in the Shaft Guard in a convenient location.
2) Install the Bulkhead Union Fitting in the Shaft Guard.
3) Connect the rest of the supplied fittings to the existing Bearings. Both plastic Polyflo and Stainless Steel Tubing is included in the package. Use the Stainless Steel Tubing for a more permanent installation.

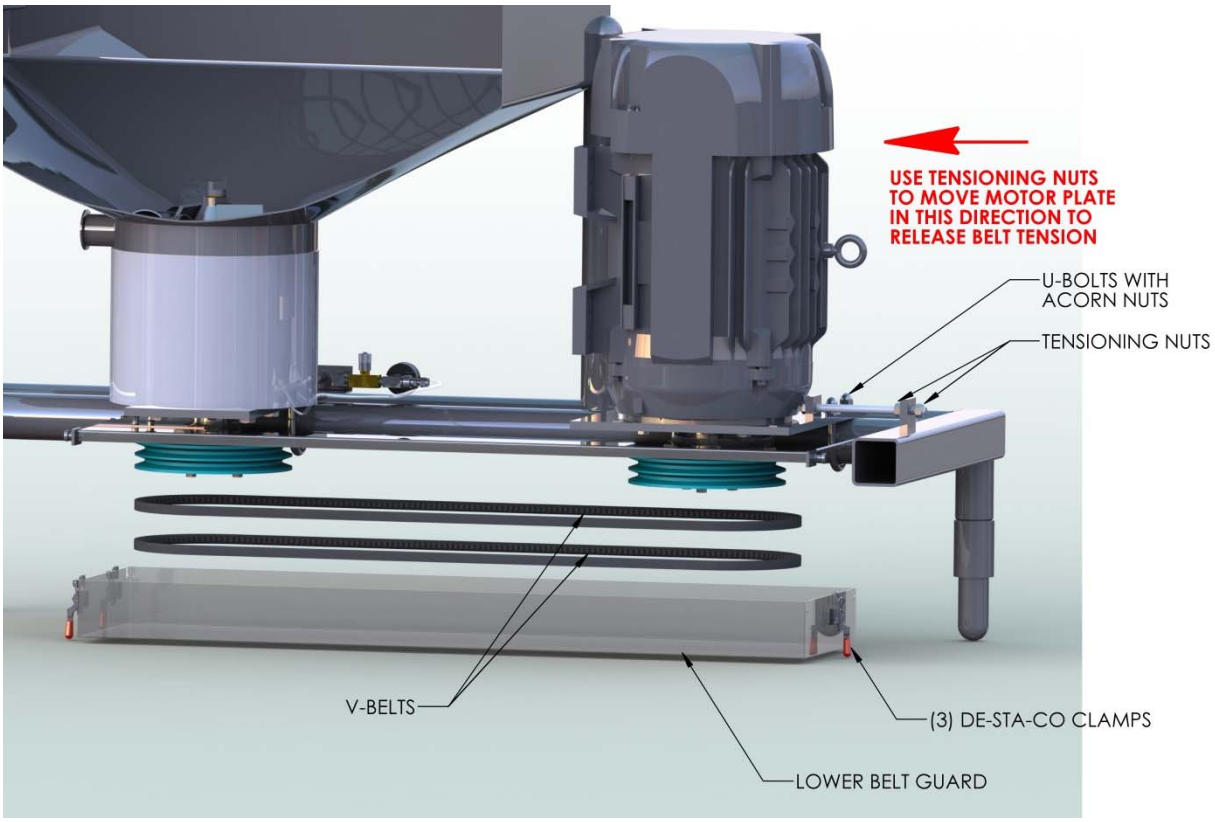
Seal Removal



To Remove the Impeller and Seal:

1) Loosen and remove the Impeller Retainer Bolt.
2) Lift and remove the Impeller, O-Ring and Flat Gasket.
3) Carefully lift the seal out of the Bottom Sump.

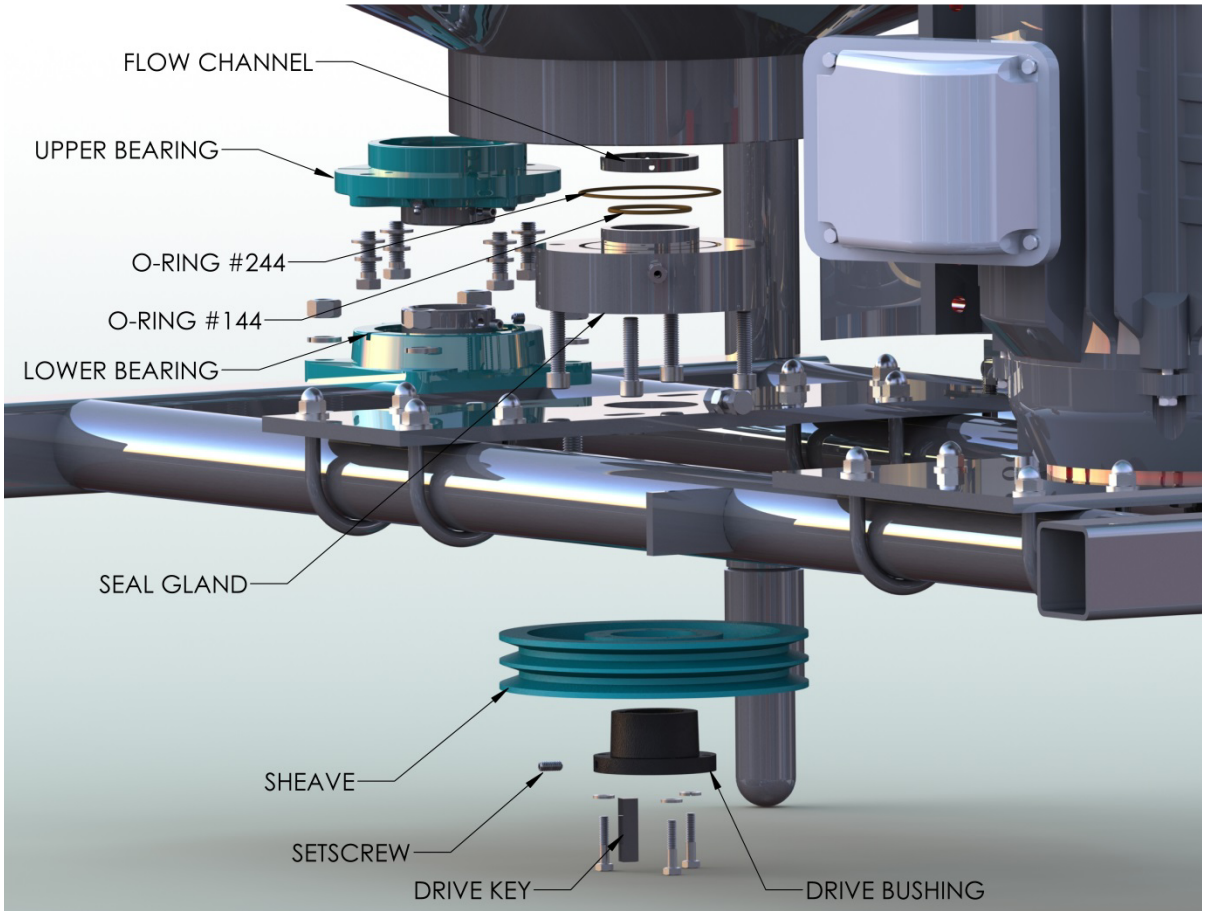
Belt Removal



To Remove Drive Belts:

4) Loosen all nuts on the (4) U-bolts holding the motor plate to the frame.
5) Loosen the Outermost Tensioning Nut, and using the Inner Tensioning Nut, push the Motor and Motor Plate toward the Mixer to release the belt tension.
6) Unclamp the (3) De-Sta-Co- Clamps welded on the Lower Belt Guard and remove the Lower Belt Guard.
7) The V-Belts may now be removed.

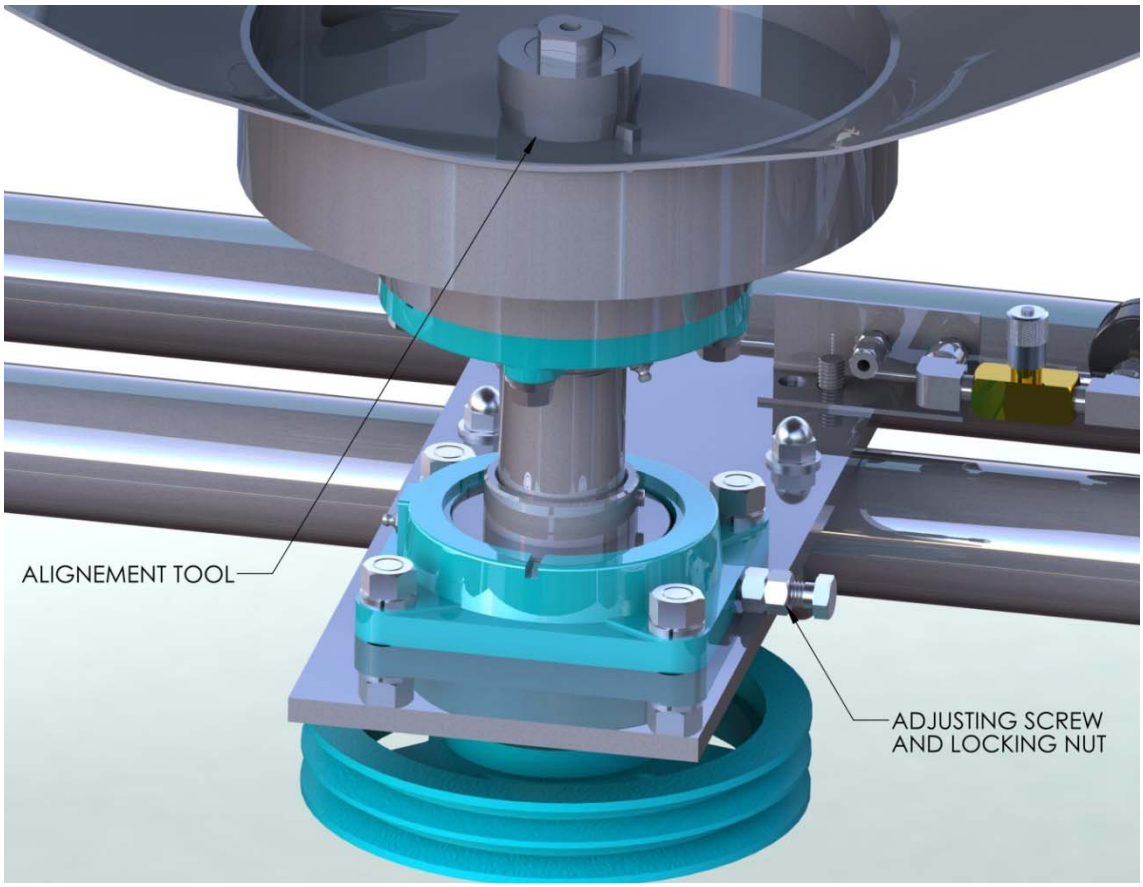
Bearing Replacement



To Replace Bearings:

1) Remove the Impeller and Seal as shown previously.
2) Remove the belt tension on the V-Belts as shown previously.
3) Remove the Shaft Guard around the Bearings.
4) Loosen the Setscrew opposite the keyway on the Drive Bushing attaching the Drive Sheave to the Drive Shaft. Remove the (3) screws from the Drive Bushing. The Sheave may be placing the (3) screws from the Drive Bushing into the tapped holes on the Drive Bushing. The screws can now be used as jackscrews to remove the Drive Bushing and Drive Sheave.
5) Loosen the setcrews on the Upper and Lower Bearings. The Drive Shaft can now be removed from inside the tank or lowered to the floor.
6) The Bearings can now be unbolted and removed for inspection or replacement.
7) Remove the Seal Gland to Inspect the O-Rings and verify the flow channel is in place.

Shaft Alignment

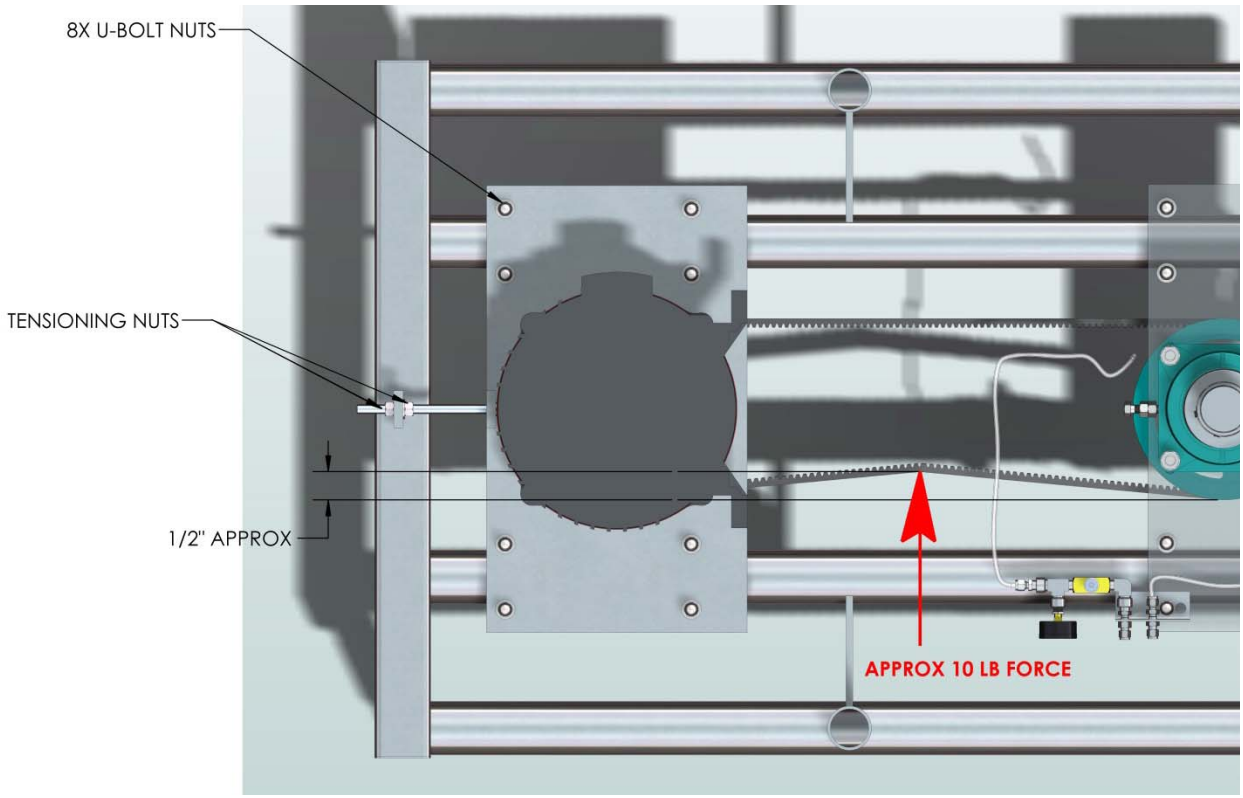


To Align Shaft:

When the Bearings are replaced, or in the event of frequent seal failure, it may be necessary to realign the Drive Shaft.

1) Remove the Shaft Guard around the Bearings.
2) Remove the tension on the V-Belts.
3) Loosen the setcrews on the Upper and Lower Bearings. Loosen the Lower Bearing mounting bolts and back off the Adjusting Screw and Locking Nut.
4) Remove the seal as outlined above.
5) Insert the Alignment Tool supplied with the machine into the Seal bore. The nose of the tool should slip easily into the Seal bore. To set the proper Seal height, position the Drive Shaft so that the top of shoulder of the Drive Shaft is flush with the top of the Alignment Tool.
6) Rotate the Alignment Tool and check that the Sump Key engages the slot in the Alignment Tool.
7) With the Alignment Tool in place, Tighten the Lower Bearing bolts and tighten the Adjusting Screw and Lock nut against the Lower Bearing.
8) Tension the V-Belts as described in this manual.

V-BELT TENSION



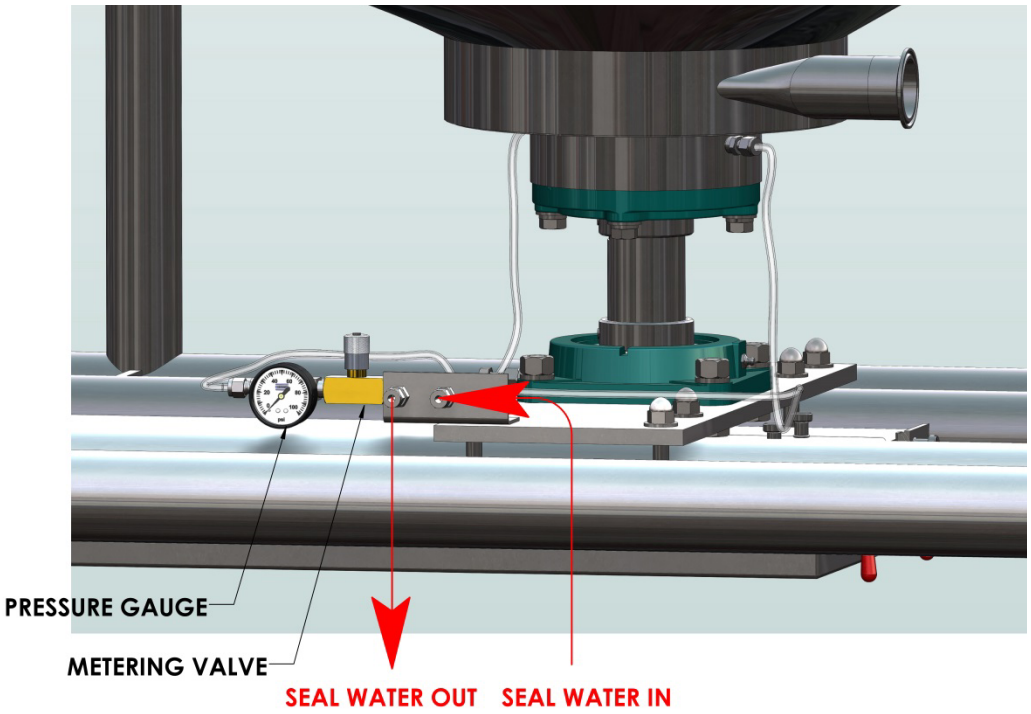
General Rules for Tensioning V-Belt Drives:

- Ideal tension is the lowest tension at which the belt will not slip under full load.
- Check tension frequently during the first 24-48 hours of operation.
- Overtensioning shortens belt and bearing life.
- Keep belts from foreign material which may cause it to slip.
- Make V-belt inspection periodically and re-tension when required.
- Never apply belt dressing as this will damage the belt and cause premature failure.

To Tension Belts:

1) With the Belt Guard removed, loosen the (8) Motor Plate U-Bolt Acorn Nuts.
2) Using the Tensioning Nuts, gradually increase the tension on the V-Belts.
3) To check for proper tension, depress the V-Belt halfway between the Sheaves. The belt should deflect approximately ½" with approx. 10 lbs pressure.
4) When the proper tension is achieved, tighten the Tensioning Nuts and the U-Bolt Acorn Nuts.

Seal Flush Accessories



Hooking Up the Seal Flush:

The Rapidmixer utilizes a Double Mechanical Seal, which requires 1 GPM at 35 PSI of a clean flush liquid (typically water) to lubricate the seal faces and dissipate the seal generated heat.

FAILURE TO CONNECT THE SEAL FLUSH WILL CAUSE IMMEDIATE SEAL FAILURE!

1) Connect the seal water inlet and outlets to the machine using the supplied compression fittings.
2) Using the supplied Pressure Gauge and Metering Valve, adjust the pressure going to the seal to 35 PSI.
3) Check the outlet port to ensure the seal liquid is circulating through the seal.

Troubleshooting Guide

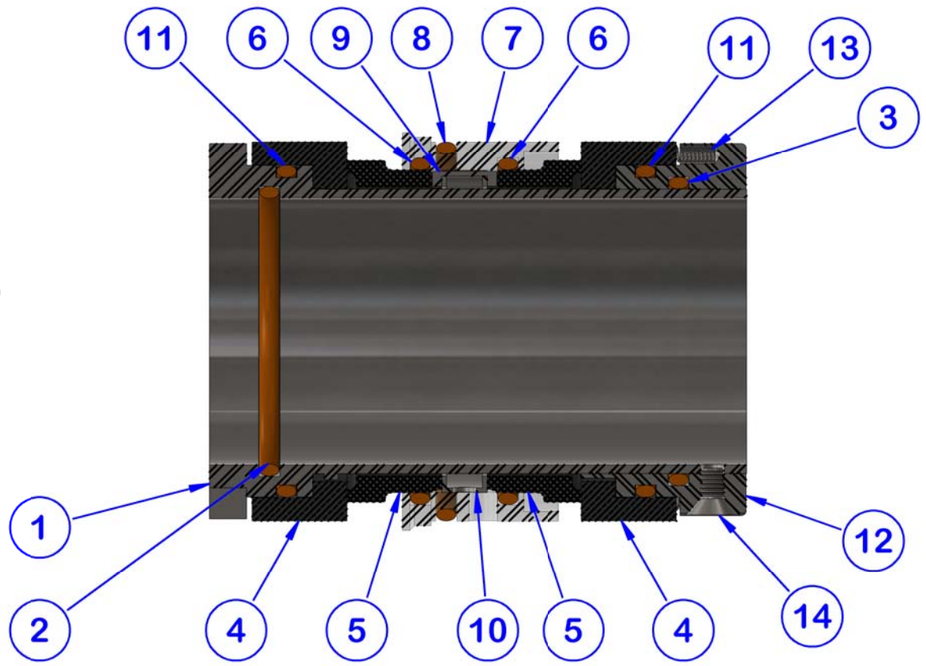
Difficulty	Cause	Remedy
Bearings Run Hot (above 170 Deg F)	Too much grease in the bearing	Remove grease fittings until the bearing is purged of excess grease. Increase frequency of lubrication with smaller amounts.
Short Seal Life	Seal Flush not connected or line is plugged Shaft is out of alignment Bearing Failure	Connect seal flush, verify that flow is passing through the seal. Align Shaft per Instructions Replace Bearings
Seal spins in bottom sump	Seal height not properly set Seal not fully seated Drive Key in sump missing or not engaging slot in seal	See Shaft Alignment instructions Firmly push the seal housing into the sump Consult factory
Short Bearing Life	Drain slots in bearing missing or plugged V-Belts overtensioned Insufficient Bearing lubrication Water entry into Bearings Bearing Collar setscrews loose	Only use factory supplied replacements. Clean out drain slots periodically Tension V-Belts per Instructions Increase lubrication interval or install grease lubricator on bearings Always run the Rapidmixer with the Shaft Guards in place Tighten setscrews
Excessive Vibration	Shaft bent or Impeller damaged	Replace faulty component
Poor Mixing performance	Impeller running backward Impeller running too slowly for process conditions Incorrect Impeller for process conditions	Verify impeller is rotating counterclockwise. Rewire motor as required Consult factory for alternative sheave combinations to optimize Impeller speed Consult factory for alternate impeller styles

TOLERANCE UNLESS
OTHERWISE SPECIFIED

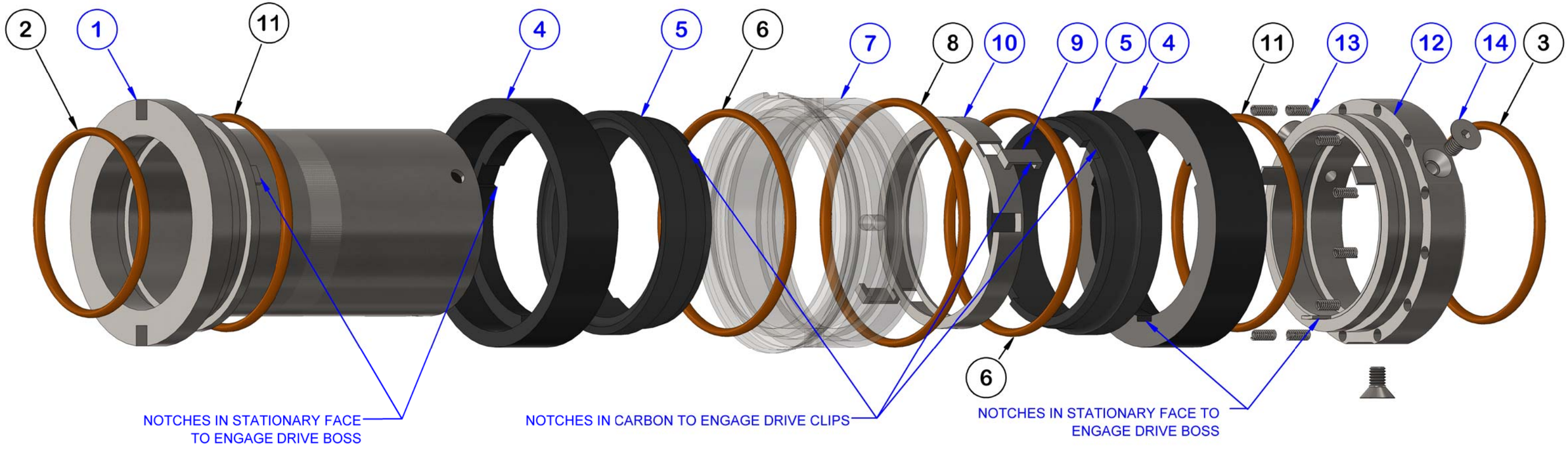
MACHINED DIMENSIONS
1 PLACE ± .060
2 PLACES ± .030
3 PLACES ± .005

FRACTIONAL DIMENSIONS ± 1/16

ANGULAR DIMENSIONS ± 1°



ITEM #	DESCRIPTION	QTY	MAT'L
1	SLEEVE	1	316 SS
2	O-RING (-132)	1	VITON
3	O-RING (-136)	1	VITON
4	ROTARY SEAL RING	2	SIL CARBIDE
5	STATIONARY SEAL RING	2	CARBON
6	O-RING (-138)	2	VITON
7	ADAPTER	1	316 SS
8	O-RING (-141)	1	VITON
9	DRIVE CLIP	2	316 SS
10	DRIVE CHANNEL	1	316 SS
11	O-RING (-134)	1	VITON
12	LOCK RING	1	316 SS
13	SPRING	12	HASTELLOY C
14	FLAT HEAD CAP SCREW	3	316 SS



NO.	ALTERATION	DATE	CHG. BY

FILE#: L:\PROJECTS\DWG | DRAWN BY: FSK

FELDMEIER EQUIPMENT
575 EAST MILL STREET
LITTLE FALLS, NY 13365

SCALE: 1:1 | ENGRG. Approved By | REV

DATE: | SHEET: of N2

RAPIDMIXER SEAL REBUILD
CHESTERTON TYPE 255, 1.75"

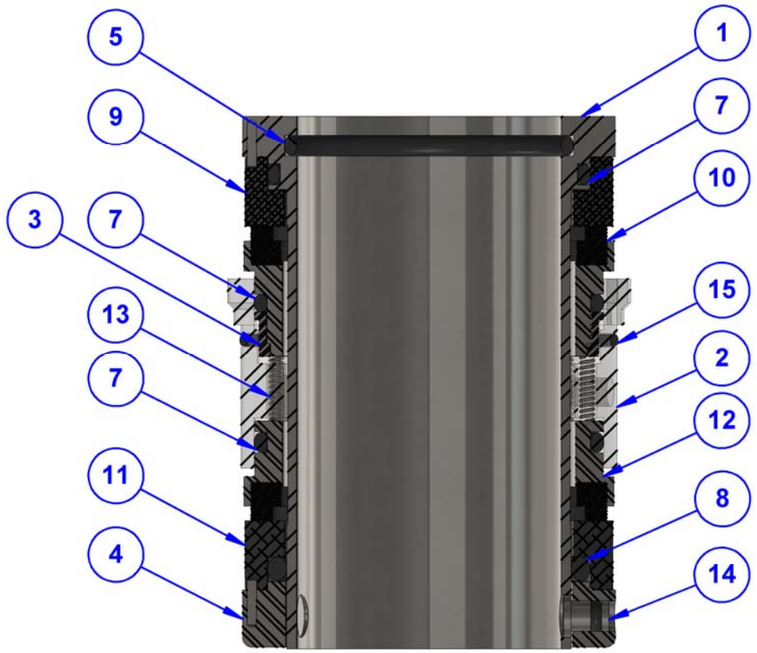
DRAWING NO.

TOLERANCE UNLESS
OTHERWISE SPECIFIED

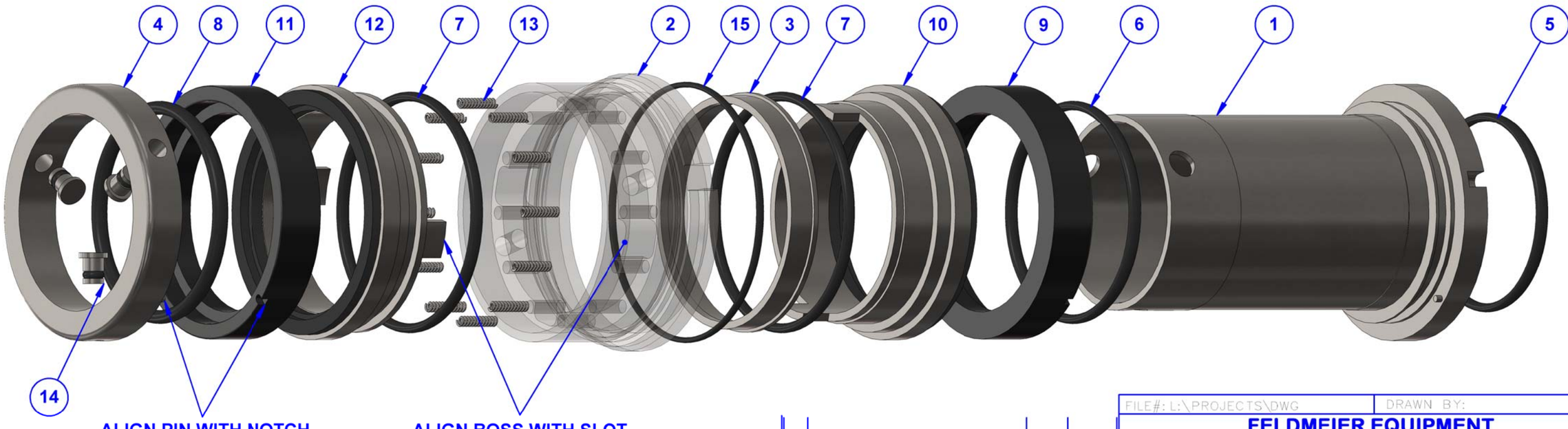
MACHINED DIMENSIONS
1 PLACE ± .060
2 PLACES ± .030
3 PLACES ± .005

FRACTIONAL DIMENSIONS ± 1/16

ANGULAR DIMENSIONS ± 1°



ITEM #	DESCRIPTION	QTY	ASI PART NUMBER	MAT'L
1	SLEEVE	1	D5787:1L	316 SS
2	HOUSING	1	D5790:1/M5790:0	316 SS
3	COMPRESSION RING	1	D5794:0L	316 SS
4	LOCK COLLAR	1	D5792:1L	316 SS
5	O-RING, SHAFT	1	-132	VITON
6	O-RING, INBOARD ROTARY	1	-135	VITON
7	O-RING, STATIONARY	2	-138	VITON
8	O-RING, OUTBOARD, ROTARY	1	-225	VITON
9	INBOARD ROTARY FACE	1	D5791:0L	SILICONE CARBIDE
10	INBOARD STATIONARY FACE	1	D5788A-01A	316 SS/CARBON
11	OUTBOARD ROTARY FACE	1	D5791:0L	SILICONE CARBIDE
12	OUTBOARD STATIONARY FACE	1	D5789A-01A	316 SS/CARBON
13	SPRING	12	07A020-21	HASTELLOY
14	DRIVE STUD	3	AS18-01	316 SS
15	O-RING, HOUSING	1	-036	VITON



ALIGN PIN WITH NOTCH BOTH ROTARY FACES

ALIGN BOSS WITH SLOT BOTH FACES 90° APART

NO.	ALTERATION	DATE	CHG. BY

FILE#: L:\PROJECTS\DWG | DRAWN BY:

FELDMEIER EQUIPMENT
575 EAST MILL STREET
LITTLE FALLS, NY 13365

SCALE: | ENGRG. Approved By | REV
DATE: | SHEET: of N2

RAPIDMIXER SEAL DETAIL
ASI SEAL 1.75" SHAFT

DRAWING NO.

This equipment cannot be entered without

a Confined Space Permit

per your facility requirements.

Prior to entry, ALL equipment

must follow the appropriate

Lock-Out Tag-Out procedures

per your facility requirements.

Thermal Shocking of Heat Transfer Surfaces (dimple jackets & channel-wall) and Vessels: Definitions and Recommendations

"Thermal Shocking" of heat transfer surfaces and vessels is defined as a sudden temperature change which can effect the material in a way which can result in a heat transfer or vessel to no longer hold pressure due to stress cracks and leakage. Thermal shocking can also cause external sheathing welds to crack. Thermal shocking will shorten the service life significantly; cause shutdown time for unscheduled repairs and in some cases makes the vessel or tank inoperable.

Feldmeier Equipment can accommodate your needs if thermal shocking is required in your process. Our Engineers can assist you in a design that will not be affected by thermal shocking and thus the life expectancy of your vessel. Feldmeier has designs and procedures, which can avoid thermal shocking and will meet your process requirements. Our Design Engineers will work with you on an individual basis for clarification of the below parameters.

-Thermal shocking for a **Heat Transfer Surface** is defined as when the change in heating and/or cooling media is more than 25 degrees F (at the inlet) at any given time.

-Thermal shocking for a **Vessel** is defined as when the media (liquid or gas) changes more than 50 degrees F at any given time.

-Thermal shocking may also occur if there is a **difference** in temperature of **vessel** media and **jacket** media of greater than 25 degrees F.

The WARRANTY on Feldmeier vessels and tanks will not cover any damages caused by thermal shocking the heat transfer and/or vessels.

Examples of "thermal shocking":

1. Immediately switching the dimple jacket media from steam to cooling water.
2. Immediately switching the dimple jacket media from cooling water to steam.
3. Having steam on the vessel interior and at the same time running cold water in the heat transfer jacket (or vice versa).
4. The cleaning of a vessel at high temperatures and then rinsing with cold water without tempering the rinse water. This is a commonly overlooked thermal shocking condition.

FELDMEIER EQUIPMENT, INC.
LOCATIONS
SYRACUSE, NY | LITTLE FALLS, NY | SHELL ROCK, IA | MONTGOMERY, AL | FERNLEY, NV | CANADA

CARE OF STAINLESS STEEL

The stainless steel components in Feldmeier equipment are machined, welded, and assembled by skilled craftsmen using manufacturing methods that preserve the corrosion-resistant quality of the stainless steel.

Retention of corrosion-resistant qualities under processing conditions requires regular attention to the precautions listed below. (Note: Corrosion-resistance is greatest when a layer of oxide film is formed on the surface of the stainless steel; should this film be disturbed or destroyed, stainless steel becomes active and much less resistant to corrosion)

1.) Regularly check all electrical devices connected to the equipment for stray currents caused by improper grounding, damaged insulation or other defects.

Corrosion: "Pitting" often occurs when stray currents come in contact with moist stainless steel.

2.) Never leave rubber mats, fittings, wrenches, etc. in contact with stainless steel.

Corrosion: Pitting or galvanic action. Objects retard complete drying, preventing air from reforming the protective oxide film. Galvanic Corrosion occurs when two dissimilar metals touch when wet.

3.) Use water conditioner when the water supply contains foreign matter, which may cause discoloration or deposits.

Corrosion: Pitting, deposits, discoloration. Deposits counteract the best cleaning practices and cause corrosion of the best quality stainless steel.

4.) Immediately rinse equipment after use with warm water until the rinse water is clean. Clean the equipment (manual or CIP) as soon as possible after rinsing.

Corrosion: Discoloration, deposits, pitting. Product deposits often cause pitting beneath the particles.

5.) Use only recommended cleaning compounds. Purchase chemicals from reputable and responsible chemical manufacturers familiar with stainless steel processing equipment. They continuously check the effects of their products on stainless steel.

6.) Use cleaning chemicals exactly as specified by the manufacturer. Do not use excessive concentrations, temperatures, or exposure times.

Corrosion: Pitting, discoloration, stress cracks. Permanent damage often occurs from excessive chemical concentrations, temperatures, or exposure times.

CARE OF STAINLESS STEEL – Cont.

7.) For manual cleaning, use only soft non-metallic brushes, sponges, or pads. Brush with the grain on polished surfaces; avoid scratching the surface.

Corrosion: Pitting, scratches. Metal brushes or sponges will scratch the surface and promote corrosion over a period of time. Metal particles allowed to remain on a stainless steel surface will cause pitting.

8.) Use chemical bactericides exactly as prescribed by the chemical manufacturer in concurrence with local health authority. Use the lowest permissible concentration, temperature and exposure time possible. Flush immediately after bacterial treatment. In no case should the solution be in contact with stainless steel more than 20 minutes.

Corrosion: Protective film destroyed. Chlorine and other halogen bactericides can destroy the protective film. A few degrees increase in temperature greatly increases chemical activity and accelerates corrosion.

9.) Regularly inspect equipment for surface corrosion. If deposit or color corrosion is detected, remove it immediately using mild scouring powder. Rinse thoroughly and allow to air dry. Review production and cleaning procedures to determine the cause.

Note: If corrosion is not removed, the protective film cannot be restored and corrosion will continue at an accelerated rate.

INSTALLATION

Inspection on Arrival

This equipment has received a careful final inspection. It has been crated securely to ensure delivery without damage or loss of any parts. At the time of delivery, please inspect the equipment for any visual damage or shortage. If damage or shortage has occurred, record on freight bill accordingly and have the driver sign. Unpack the equipment as soon as possible, and if you find concealed damage, hold all packaging material and call delivering carrier for inspection and to fill out inspection report (furnished by the transportation company). Then file a claim with the transportation company. They are responsible for any damage that may have occurred in shipment. For our records, we will appreciate your advising us of any damage or loss claims you file so we may assist you in every way.

Setting and Leveling

Make certain the floor is strong enough to support the tank when fully loaded. Skid the tank to the selected location.

Lifting lugs around the upper seam provide a means for handling. Level as accurately as possible by holding a plumb line near the sides and establishing the vertical accuracy at several points between the top and bottom. Adjust the screw type legs to engagement as $1^{1/2}$ inches.

If outlet height is important, it should be established before leveling and rechecked after leveling.

Electrical Connection

A qualified electrician should make the motor power connections. The power characteristics must agree with those on the motor data plate. Machines are normally shipped without motor starting switches.

Direction of Agitator Rotation

Rotation of the drive-motor shaft must be in the direction shown by the arrow on the tank. On 3-phase motors, reverse any two of the three wires if motor is turning in the wrong direction.

Water Test

After installation of the tank and all accessories, a static test with water should be performed to ensure that there are no leaks.

MAINTENANCE

Daily Cleaning of Exposed Surfaces

Cleaning all the surfaces, both inside and outside of the equipment is very important in order to maintain good sanitation as well as to preserve the stainless steel finish. Food products and foreign materials, which are allowed to adhere to the surface for any length of time, can cause a change in the finish surface of stainless steel. These surfaces must have free access to the air. Ordinarily, normal air exposure that occurs between one day's processing and the next will be sufficient.

Do not use plain wool to brighten surfaces as the plain steel particles may adhere to the surface and show up as rust spots on the stainless steel. If you must use a steel wool, be sure it us made of stainless steel.

SANITIZING

Hot Water

Hot water sanitizing (above 180^0 F) should be preceded by a warm tempering spray rinse.

Steam

If steam sanitizing is preformed just prior to product run, never direct steam flow against any metal surface. Severe metal stress will result.

Important facts to Remember

1. Venting is necessary if sudden internal air temperature changes occur.

2. Sudden changes in temperature (thermo-shock) which will create excessive strain in the lining should be avoided.

   a. While spray cleaning is on the heating phase of any cycle, build up the liquid temperature for the first 10 minutes to act as a tempered rinse. Continue to circulate for 15 minutes at the final solution temperature for the wash cycle and 5 minutes for the sanitation cycle.

   b. On cooling rinse cycles, bring the temperature down by letting some of the hot solution go to waste while fresh tap water is introduced to the supply tank.

   c. A good rule to follow is to provide a 10^0 change per minute in the spray. Where burn-on or precipitation of minerals is a problem, special consideration must be given to greater rates of change.

3. Processors not designed for vacuum must never be operated under vacuum and all procedures that can create this condition must be eliminated. CIP systems with centrally controlled timer operation should be set to avoid sudden temperature drops which would create a vacuum.

4. CIP cleaning is not always capable of 100% cleaning. Some agitator components may have to be disassembled and hand cleaned prior to sanitizing. Whenever possible, vessel should be filled to top of agitator with CIP solution and agitator should be running during cleaning cycle.

TROUBLESHOOTING

Difficulty	Cause	Remedy
Slow Heating	1.) Steam supply line too small or too long.	Check for tap-off to other equipment. Increase size of line for low pressure steam.
	2.) Boiler overloaded.	Measure the pressure at the vat while it is operating. Increase the boiler capacity or rearrange the plant operating schedule.
	3.) Temperature regulator defective.	Test by removing bulb and check for operation in can of water of known temperature, then see "Spare Parts" page attached.
	4.) Heating zones waterlogged (steam heating).	Steam trap is not discharging water. Repair or replace, see "Spare Parts" page attached.
	5.) Condensate return line to boiler plugged or valve closed.	Open or replace line.
	6.) Heating zones air bound (hot water heating).	Discharge air through "air vent" valve.
	7.) Failure to use steam bypass on automatic regulator during early heating.	Open bypass until product reaches 100^0F
	8.) Steam strainer clogged.	Remove plug and blow out.
	9.) Channels and headers plugged with water scale or rust.	Flush with cleaner
	10.) Defective pump (hot water heating).	Check for air leaks in suction side, binding or shaft, leaky packing, worn impeller, impeller clogged by excelsior, foreign material, or impeller running in wrong direction.
	11.) Pump impeller running in wrong direction (hot water heating).	Reverse two leads in starter box.
	12.) Plugged lines feeding headers.	Replace lines (or clean), see "Spare Parts" page attached.
	13.) Valve following steam trap closed.	Open when cooling is completed.
	14.) Insufficient agitation.	Adjust baffle for greater agitation or use higher agitation speed if available.
	15.) Agitator blades pitched too low.	Have serviceman adjust. See "Spare parts" page attached.

Difficulty	Cause	Remedy
Excessive burn-on	1.) Steam in zones above product level.	Open zone valves beneath product level, one by one, as level rises. (Note that the vat is designed to permit some steam to bleed into the shut-off zones to preheat them and limit distortion of vat linings.)
	2.) Insufficient agitation.	Increase pitch of adjustable baffle or increase speed of the agitator (is so equipped).
	3.) Agitator running in wrong direction.	Reverse any two leads of three phase connections at starter.
	4.) Excessive agitation throws product on side walls.	Change baffle position or lower speed of agitator.
	5.) Temperature regulator faulty.	Consult supplier.
Slow Cooling	1.) Insufficient water supply.	Check requirements.
	2.) Burn-on during heating.	See remedies under "Burn-on".
	4.) Cooling water bypassing through pump (hot water heating).	Keep union valve "I" closed while cooling.
	5.) Zones above product level turned on.	Turn off to avoid wasting water through ineffective zones.
	6.) Circulating pump clogged by foreign material.	Clean out pump and lines before installing.
	7.) Temperature of cooling water is too high.	Check temperature.
	8.) Air space heater may have been left on.	Shut off when cooling.
	9.) Low voltage condition affecting pump and agitator.	Check plant wiring for overload.
Agitation Wobbles	1.) Mount is out of alignment	Have service man align per factory instructions.
	2.) Shaft is bent	Have service man align per factory instructions.
	3.) Bottom bushing problem	Inspect / replace bottom bushing
Slow Mixing	1.) Adjustable baffle incorrectly set.	Move baffle at right angles to flow of product.
	2.) Agitator running wrong direction.	Reverse any pair of 3 phase wires to starting relay.
	3.) Agitation running slow.	Increase speed if equipped with VFD.
Motor Troubles.	1.) Agitator motor running hot.	a. Overload- Motor may be unsuited for product more viscous than originally planned. Check motor amp draw. Compare with motor nameplate. b. Motor improperly connected. c. Motor and agitator out of alignment. Have serviceman check. d. Motor or reduction unit requires lubrication. See "Lubrication" information attached.

REQUIRED VENTING FOR VACUUM CONDITIONS IN VESSELS

In order to protect processing and storage tanks against implosion that can occur adequate venting must be provided. Conditions, which can cause implosion (or a vessel to be sucked in), are:

- When too much vacuum is pulled during liquid product withdrawal
- During cooling cycle following hot water or steam cleaning of tanks
- During an overflow condition

When product is discharged the venting must allow for an equivalent volume of air to enter the vessel. Per the 3-A sanitary standards a 2" vent is adequate for 175 gpm discharge, a 3" vent handles 400 gpm and a 4" vent is adequate for 700 gpm. Table A-1 from the 3-A standards is shown below. When a silo is imploded during discharge it is generally due to an obstructed vent or vent line.

Flash cooling following CIP is the most often overlooked condition causing a vessel to implode. The vacuum created when cool water is sprayed into a hot vessel can cause the volume of air to shrink by 10% in one second. The manway must be open to accommodate this condition. Below is a caption from the 3-A standards describing this condition.

Overflow may also cause a vessel to be exposed to vacuum. In most silos for example designated lines are provided for venting and overflow conditions. During discharge both serve as a vent. During an overflow condition air is drawn from the top head with the liquid. The vent is designed for this. If the product is allowed to continue to overflow and fills the vent line the top head can implode.

TABLE A-1
From 3-A standard #22-08

Min. Free Vent Opening Size		**Max. Filling or Emptying Rate**
Area	**I.D.**	
2.5 $in.^2$ (16 cm^2)	1-3/4 in. (44.5 mm)	175 gpm (662 Lpm)
4.0 $in.^2$ (26 cm^2)	2-1/4 in. (57.2 mm)	300 gpm (1136 Lpm)
6.0 $in.^2$ (39 cm^2)	2-3/4 in. (69.9 mm)	400 gpm (1514 Lpm)
11.0$in.^2$ (71 cm^2)	3-3/4 in. (95.2 mm)	700 gpm (2650 Lpm)
26.0$in.^2$ (168 cm^2)	5-3/4 in. (146.0 mm)	1500 gpm (5678 Lpm)
47.2$in.^2$ (304 cm^2)	7-3/4 in. (196.8 mm)	2750 gpm (10410 Lpm)

From 3-A standard #22-08
For example, when a 6,000 gal. Tank (with 800 cu. ft. of 135 deg. F hot air after cleaning) is suddenly flash cooled by 50 deg. F water sprayed at 100 gpm the following takes place: Within one second, the 800 cu. ft.. of hot air shrinks approximately 51 cu. ft. in volume. This is the equivalent in occupied space of approximately 382 gal of product. The shrinkage creates a vacuum sufficient to collapse the tank unless the vent, manhole, or other openings allow the air to enter the tank at approximately the same rate as it shrinks. It is obvious, therefore, that a very large air vent such as the manhole opening is required to accommodate this airflow.

FELDMEIER EQUIPMENT, INC.

LOCATIONS
SYRACUSE, NY | LITTLE FALLS, NY | SHELL ROCK, IA | MONTGOMERY, AL | FERNLEY, NV | CANADA

For Spare Parts
Contact:

Richard J. Bailey

David J. Hyney

Repair Parts Coordinator
575 East Mill Street
Little Falls, NY 13365

Phone: (800) 258-0118
or (315) 823-2000
Fax: (315) 823-0234

FELDMEIER EQUIPMENT - SPARE PARTS LIST
FELDMEIER SERIAL NO.: 15E0140

PART #	DESCRIPTION	QTY.	LIST PRICE EACH
4030448	ALIGNMENT TOOL-DOUBLE SEAL RM	1	$140.00
1034216	BEARING-LOWER W/SLOT 2-7/16"	1	$255.00
1034215	BEARING-UPPER W/SLOT 2-7/16"	1	$255.00
S1030600	CLAMP SANITARY 3.0" HEAVY DUTY	2	$25.00
S1040600	CLAMP SANITARY 4.0" HEAVY DUTY	1	$35.00
1959025	CLAMP, DE-STA-CO MODEL #323-SS	3	$17.50
2501133-4	COVER ASM-VAPOR TITE 24" 316L	1	$705.00
1036889	FLOW CHANNEL-DBL SEAL RAPMIXER	1	$275.00
BF15108040	FOOT BALL 304 1.5" S40 X 8" X 4.0" THD	6	$98.00
1554259	GASKET 24" M/H WHITE SILICONE N-SHAPE	1	$95.00
S1030506	GASKET 40MPX-W SILICONE 3.0"	2	$3.50
S1040506	GASKET 40MPX-W SILICONE 4.0"	1	$6.50
S1040506	GASKET 40MPX-W SILICONE 4.0"	1	$6.50
1032595	GASKET-IMPELLER-RADIPMIXER	1	$30.00
2500440-1	HAND KNOB-VAPOR TIGHT 3/8"-16	1	$50.00
2501124-1	HINGE ARM 20" & 24" VAPOR TITE	1	$240.00
8009423-4	IMPELLER 12"-RAPIDMIXER 316L STN STL	1	$2,395.00
1034541	KEY-DRIVE 1/2" X 2 RM	1	$22.00
1412889	MOTOR 75HP 1800RPM C FACE	1	$7,050.00
1951009	NUT HEX 1/2-13 UNC SS	9	$1.00
1951005	NUT HEX 1/4-20 UNC SS	4	$0.25
1951011	NUT HEX 5/8-11 UNC STN STL	4	$2.00
Z04214	O-RING #214 VITON (FDA)	1	$7.00
1554520	O-RING 244 VITON	1	$10.50
1590761	PIN-CLEVIS 1/4"X2"LG STN STL	2	$3.00
1027811	PIN-CLEVIS-M/W 3/8" X 1-5/8"	1	$12.00
2501129-4	PIN-HINGE-VAPOR TITE MANWAY	1	$6.00
1959103	RET.RING IRR# 3100-37-SSZ	4	$2.00

Contact: Rich Bailey or David Hyney
(p) 800-258-0118 (f) 315-823-0234
rbailey@feldmeier.com
dhyney@feldmeier.com

FELDMEIER EQUIPMENT - SPARE PARTS LIST
FELDMEIER SERIAL NO.: 15E0140

PART #	DESCRIPTION	QTY.	LIST PRICE EACH
1952003	SCR CAP HH 1/2"-13 UNC X 1-1/2" LG 304	1	$1.50
1952009	SCR CAP HH 1/2"-13 UNC X 1-3/4" LG 304	4	$1.50
1952053	SCR CAP HH 5/8"-11 UNC X 2" LG 304	4	$3.25
2501842	SCREEN VENT 4" CLAMP-ON	1	$275.00
2501843	SHROUD VENT 4" CLAMP-ON STYLE 'S'	1	$320.00
1034539	SLINGER-LOWER BEARING RM	1	$21.00
1959108	SMALLEY SPIRAL RING WH-125-S16	2	$2.00
2501636-4	SPRAYBALL 2.5 X 1.5 STANDARD 360 DEG	2	$325.00
2500479-4	TUBE-INLET-CIP 1.5" 'S' X 3" 'S' CAP REMOVABLE	2	$295.00
1417440	V-BELT - BX120 - 123 INCHES OUTSIDE	4	$89.00
1957009	WASHER FLAT 1/2" 304 SS	4	$0.50
1957009	WASHER FLAT 1/2" 304 SS	22	$0.50
1957011	WASHER FLAT 5/8" 304 SS	4	$1.00
1957209	WASHER LOCK 1/2" 304 SS	4	$0.25
1957211	WASHER LOCK 5/8" 304 SS	8	$0.45
1957211	WASHER LOCK 5/8" 304 SS	4	$0.45
1032592	RETAINER-IMPELLER-RAPIDMIXER	1	$250.00

Contact: Rich Bailey or David Hyney
(p) 800-258-0118 (f) 315-823-0234
rbailey@feldmeier.com
dhyney@feldmeier.com

PARTS LIST

HOW TO ORDER PARTS

800-258-0118 THIS IS THE TOLL FREE NUMBER TO CALL WHEN YOU NEED REPAIR PARTS. YOU WILL BE CONNECTED WITH A SPECIALIST ON YOUR EQUIPMENT WHO CAN ASSIST IN DETERMINING THE PARTS YOU REQUIRE.

IF YOU NEED INFORMATION ABOUT SHIPPING DATES, ROUTING, AND DELIVERY INFORMATION THE SPECIALIST WHO EXPEDITES YOUR ORDER WILL HAVE IT AVAILABLE. SHOULD YOU CHOOSE TO SEND YOUR ORDERS FOR PARTS BY MAIL, PLEASE DIRECT THEM TO:

FELDMEIER EQUIPMENT
REPAIR PARTS
575 EAST MILL ST.
LITTLE FALLS, NY 13365

HOW TO RETURN PARTS

PARTS MAY BE RETURNED FOR CREDIT SUBJECT TO THE CONDITIONS OF OUR RETURN GOODS POLICY. TO OBTAIN AUTHORIZATION TO RETURN A PART, CONTACT THE SPECIALIST BY PHONE OR LETTER AT THE SAME ADDRESS AS ABOVE OR BY CALLING OUR TOLL FREE NUMBER AND PLEASE GIVE THE FOLLOWING INFORMATION:

- INVOICE NUMBER AND DATE
- QUANTITY
- PART NUMBER
- IF A DEFECT IS CLAIMED, THE MODEL AND SERIAL NUMBER OF THE MACHINE MUST BE STATED

RETURNS ARE SUBJECT TO RESTOCKING CHARGES

EQUIPMENT WARRANTY

Feldmeier Equipment, Inc. (Feldmeier) warrants to the original purchaser that all equipment or parts thereof manufactured by Feldmeier will be free from defects in material and workmanship only, under normal use and service, for a period of one year from the date of original shipment.

This warranty will not apply to any equipment or parts thereof which have been subjected to accident, alteration, abuse, or misuse. This warranty is in lieu of all other warranties, expressed or implied and of all other obligations or liabilities on Feldmeier's part. Feldmeier will neither assume nor authorize any other person to assume for us any other obligation or liability in connection with this equipment.

Components not manufactured by Feldmeier but furnished as part of Feldmeier's scope (for example: motors, starters, thermometers, controls, etc.) will be warranted by use only to the extent of the components manufacturer's warranty.

In the event that equipment or parts thereof manufactured by Feldmeier can be returned to our factory, our obligation will be limited to repairing or replacing parts which upon our examination are found to our satisfaction to be defective in either material or workmanship.

All repairs or replacements of equipment of Feldmeier's manufacture are F.O.B. our Factory.

When a customer plans to install our equipment in a manner that will make it impractical to return it for in-warranty repairs, he/she is encouraged to visit our plant before shipment to inspect and, when possible, witness testing of the equipment. Should an in-warranty failure occur after installation, and it is in our judgment impractical to return the item for repairs, we will arrange for the repairs to be made by our personnel or, when practical, sublet to a nearby approved company. The customer will be expected to cooperate by making the equipment available and accessible when the work is scheduled and is expected to provide the necessary utilities. If local labor conditions prohibit such work being done by our personnel, our obligation shall be limited to the supervision of the work, and the replacement of defective parts with labor being furnished by the customer.

This warranty is for all equipment fabricated by Feldmeier, regardless of final destination, provided Feldmeier had knowledge of final destination at time of Purchase Order. Any change to the final destination or warranty shall be agreed upon between Feldmeier and the customer.