



Hart Engineering Corporation

SUBMITTAL:
11312-01

PROJECT: 9900. - Veolia/Taunton WWTF Phase 1 Improvements

DATE: 01/13/2022

SUBMITTAL: 11312-01 - Primary Sludge and Scum Pumps

REVISION: 1

STATUS: Eng

SPEC #: 11312

TO:
Michael Andrus
Beta Group Inc.
6 Blackstone Place
Lincoln, RI 02865
MAndrus@BETA-Inc.com

FROM:
Ryan Murphy
Hart Engineering Corporation
800 Scenic View Drive
Cumberland, RI 02864
rmurphy@hartcompanies.com

Item	Revision	Description	Status	Date Sent	Date Returned
11312-01	1	Primary Sludge and Scum Pumps	Eng	01/13/2022	
Notes:					

Additional Notes:

Status Codes

- 1-APP – No Exceptions Taken
- 2-ANR – Make Corrections Noted
- 3-R&R – Revise and Resubmit
- 4-REJ – Rejected
- 5-IPO – For Information Purposes Only
- 6-NRR – Not Required for Review
- ENG – Submitted to Engineer

Sincerely,
Hart Engineering Corporation

DATE: _____ 01/13/2022 _____



SUBMITTAL FOR APPROVAL

TAUNTON, MA

CUSTOMER ORDER NUMBER: 9900.110
WEMCO ORDER NUMBER: 86985

SECTION 11312: PRIMARY SLUDGE CENTRIFUGAL PUMPS

WEMCO TORQUE-FLOW PUMPS
4 X 11 MODEL CE
WEMCO SERIAL NUMBERS: 86985-1-1 THROUGH 86985-1-4
TAGS: PSP-2201, 2202, 2203, 2204

SECTION 11315: HORIZONTAL CHOPPER PUMPS

6 X 4 MODEL CF4 CHOP-FLOW PUMP
SERIAL NUMBERS: 86985-2-1 & 86985-2-1
TAGS: SCP-2301, 2302

MANUFACTURER

TRILLIUM FLOW TECHNOLOGIES
440 WEST 800 SOUTH
SALT LAKE CITY, UT 84101-2229
TELEPHONE: (801) 359-8731
FAX: (801) 530-7828

LOCAL REPRESENTATIVE FOR PARTS AND SERVICE

WESCOR ASSOCIATES, INC.
686 SOUTH STREET
WRENTHAM, MA 02093
TELEPHONE: (508) 384-5921

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Trillium Flow Technologies
440 West 800 South
Salt Lake City, UT 84101-2229

T 801 359 8731

F 801 355 9303

www.trilliumflow.com

2021

CUSTOMER: ESCOR ASSOCIATES INC
PO NUMBER: 11
SALES ORDER: 5
OFFICE NAME: TMA

NOTES AND COMMENTS

Submittal - 11312 - Project Standard Component

Project Standard

Tags: PSP-2201, 2201, 2203, 2204

4" X 4" WEMCO MODEL CE recessed impeller pump

- High Chrome Case, Gear Plate and Impeller
- 25 HP 1800 RPM Premium Efficient TEFC horizontal motor
- Slurry Dynamics single mechanical seal requiring no flush
- Fabricated steel belt drive baseplate – side mount with variable speed stationary control V-belts
- Spare Parts: 4 Impellers, 4 Sets Outer bearings, 4 Mechanical seals, 4 Sets V-belts, 4 Sets Motor bearings
- Carboline high performance paint coatings

Please refer to the enclosed Technical Order 1441511 Item 001 for further details.

Submittal - 11315 - Horizontal Component

Project Standard

Tag: SCP 2301 2302

Qty. (2) 6" X 4" MODEL CF4 WEMCO Chop-Flo horizontal pumps

- Steel Outer End Parts with an RC60 hardness
- 10HP 1800RPM Premium Efficient TEFC horizontal motor
- Slurry Dynamics single mechanical seal requiring no flush
- Fabricated steel baseplate – Outer and Motor directly connected via flexible coupling
- The high performance paint coatings
- Spare Parts: 1 Cutter bar, 1 Mechanical seal, 1 Impeller installation tool

Field Installation Requirements:

- Factory certified and performance testing per HI Standard 2011, 14.6, Acceptance Grade 2B

Field Installation Requirements - NOT Standard:

- Field hardware, cables, or gauges
- Gauges, cables, piping, pipe fittings, pipe supports, spare parts, extra paint, or lubricants.
- Controls or instrumentation on hand, including VFDs or starters.
- Installation & alignment
- Field testing
- Start-up, field, and training services quoted separately and provided by Wescor



Trillium Flow Technologies
440 West 800 South
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www.trilliumflow.com

Trillium Flow Technologies

Section 11312

- 2.02.H Flushless Slurry Discharge single mechanical seal is included in this proposal.

Section 11315

- 2.03.D Impeller is threaded to the pump shaft, eliminating the need for a cutter nut, which allows the cutter bar to shear against the full diameter of the impeller.
- 2.03.E The proposed pump has a single shear bar extending across the entire face of the impeller without the need for an external cutter tooth. The impeller vanes are designed such that the chipping action occurs across the entire impeller face, and there is no external cutter nut to reduce the cutting space or create an eddy currents in front of the impeller.



Trillium Flow Technologies
440 West 800 South
Salt Lake City, UT 84101-2229
T 801 359 8731
F 801 355 9303
www.trilliumflow.com

Job Name: Taunton, MA
Purchase Order #: 9900.110
WEMCO Order #: 86985

If you have any questions with this order please use the following contact list to reach the correct person.

Questions pertaining to:

Executed Purchase Orders and Commercial
Terms and Conditions:

James Cook
(801) 530-7548
james.cook@trilliumflow.com

Submittals or Operation & Maintenance Manuals:

Klaus Griessmann
(801) 530-7567
Klaus.Griessmann@trilliumflow.com

Delivery:

Klaus Griessmann
(801) 530-7567
Klaus.Griessmann@trilliumflow.com

Problems with shipment:
(missing items, wrong items, etc.)

Klaus Griessmann
(801) 530-7567
Klaus.Griessmann@trilliumflow.com

Damaged or Malfunctioning Equipment:

Joris Simon
(801) 530-7512
Joris.simon@trilliumflow.com

Please have the purchase order and the WEMCO order number associated with your order when you call.

TAB A

TAB A

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SALES ORDER DESCRIPTION

SALES SHEET NUMBER: **86985**

P/O **9900.110**

<u>QTY</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
4	4X11 CE PKG	4X11 CE

RPM: 1240
CONDITIONS: 400 GPM @ 50 FT TDH

Clockwise rotation (CW)
Steel pump hardware
Oil lubricated bearings
Nitrile elastomers *
4x4 Case
High Chrome case (650+ BHN hardness)
No case vent & drain
High Chrome impeller (650+ BHN hardness)
Steel shaft
Steel impeller lockscrew

Seal Type: Single Mechanical Seal
Seal Manufacturer: Slurry Dynamics
Atmospheric / Drive End Side Seal Face
Materials: Tungsten carbide/silicon carbide
Slurry Dynamics Single Mechanical Seal
Slurry Seal
416 SST shaft sleeve
Hi-Chrome Gland Housing Material/Backplate
Stainless steel gland

Trillium Supplied Motor: Trillium Supplied Motor
25HP 284T 1800RPM Premium Efficiency
TEFC Horizontal motor
Horizontal Motor
4 Pole, 60 Hz
Premium Efficient Severe Duty
TEFC
460 V

Belt Drive Baseplate - Side Mount
Steel Baseplate
Trillium Standard Baseplate Design
Steel Baseplate Hardware
Fiberglass/Polyethylene Guards
Left Hand Side Mount Motor
Variable Speed Belts and Sheaves Stationary Control

Serial Numbers: 86985-1-1 through 86985-1-4



Trillium Flow Technologies
440 West 800 South
Salt Lake City, UT 84101-2229

T 801 359 8731
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www.trilliumflow.com

SPARE PARTS PROVIDED

<u>Part Number</u>	<u>Description</u>	<u>Qty/Per</u>	<u>UM</u>
802215	V-BELT 5□□-690	4.	EA
805286	ASM,SEAL,MECH SLURRY DYN WITH SEAL	4.	EA
63936-1	SHAFT 11CE 1045 STL	1.	EA
63935□113	IM□□LL□R C□ 11□3.8" TRIM HCI 650 □HN	4.	□A
86958□1	□□AR□ MOTOR □□ARING□, 25 H□, 284T	4.	□A

Part Number -- 726-A35

11"CE,CEV BEARINGS-1 SET

<u>Part Number</u>	<u>Description</u>	<u>Qty/Per</u>	<u>UM</u>
100214	BRG,BALL #5310	4.	EA
100215	BRG,BALL SGL ROW	4.	EA





SIZE 8	E	F	FH	L	N	RB	RC	APPROXIMATE SHIPPING WT.
2 x 2 x 11	6	10	18 1/2	3 1/2	31 15/16	7 13/16	8 5/8	350 LBS.
3 x 3 x 11	5 1/2	10	18 1/2	4 5/8	32 15/16	7 7/8	8 5/8	370 LBS.
4 x 4 x 11	6 1/2	10 7/8	19 3/8	4 3/4	33 5/8	8 3/8	8 3/4	420 LBS.
6 x 6 x 11	6 1/2	10 7/8	19 3/8	5 3/4	35 5/8	9 3/8	9 3/4	445 LBS.

QTY	ITEM NO.	DESCRIPTION
1	1	CASE
1	2	IMPELLER
1	4	BEARING HOUSING
1	5	WEARPLATE
1	6	BACKPLATE
2	7	CAPS, BEARING HOUSING
1	9	SHAFT
1	10	LOCKSCREW, IMPELLER
1	11	SLEEVE, SHAFT
1SET	12	PACKING GLAND, SPLIT
1	13	LANTERN RING
1	15	BEARING, THRUST
1	16	BEARING, RADIAL
2	17	SEAL, OIL
1	20	SNAP RING, BEARING
1	21	SLINGER
1	22	GASKET, SLEEVE (O-RING)
2	23	GASKET, BEARING CAP
1	24	GASKET, CASE (O-RING)
5	28	PACKING RING
1	31	KEY, SHAFT
1	32	COLLET
1	78	KEY, SLEEVE DRIVE

NOTES:

- DIMENSIONS ARE NOT FOR INSTALLATION PURPOSES UNLESS CERTIFIED.
- PUMP AND ACCESSORIES ARE DESIGNED FOR CONTINUOUS DUTY.
- WET END PARTS ARE ASSEMBLED IN THE AS CAST FORM. SUCTION AND DISCHARGE PIPING SHOULD BE FITTED TO THE PUMP FLANGES AFTER THE PUMP IS SET IN PLACE AND LEVELED. USE THICK NEOPRENE GASKETS OF 40 TO 60 DUROMETER (SHORE A).
- 4 PUMP ROTATION IS VIEWED FROM SHAFT END.
- SUCTION AND DISCHARGE FLANGES MATE WITH CLASS 150 ANSI FLANGES.
- GAGE TAPS ARE NOT AVAILABLE DUE TO MATERIAL HARDNESS.
- VENTS AND DRAINS CAN BE PROVIDED IF SPECIFIED.
- 8 PUMP SIZE INDICATES: SUCTION DIA. X DISCHARGE DIA. X IMPELLER DIA.
- DIMENSIONAL TOLERANCE IS $\pm 1/16$ UNLESS NOTED OTHERWISE.

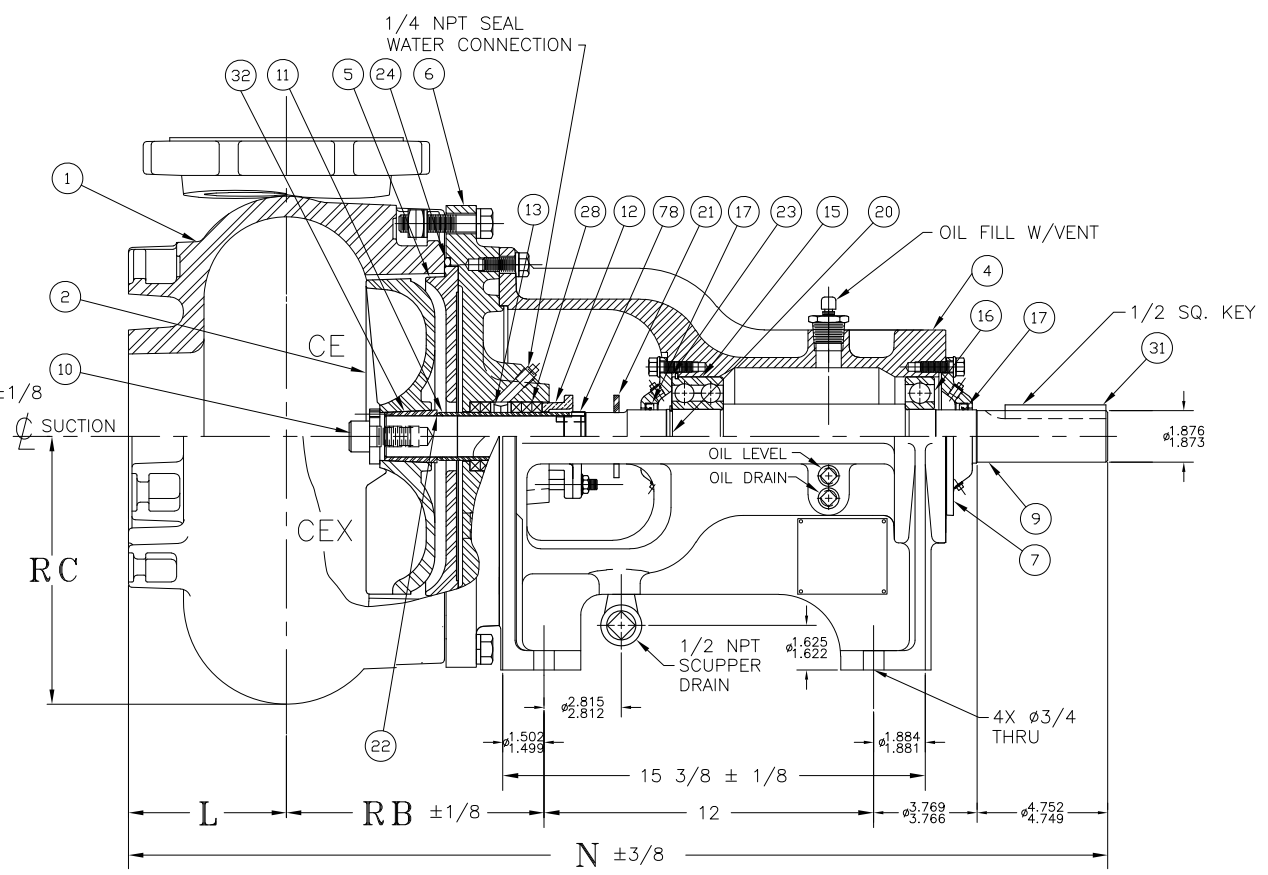
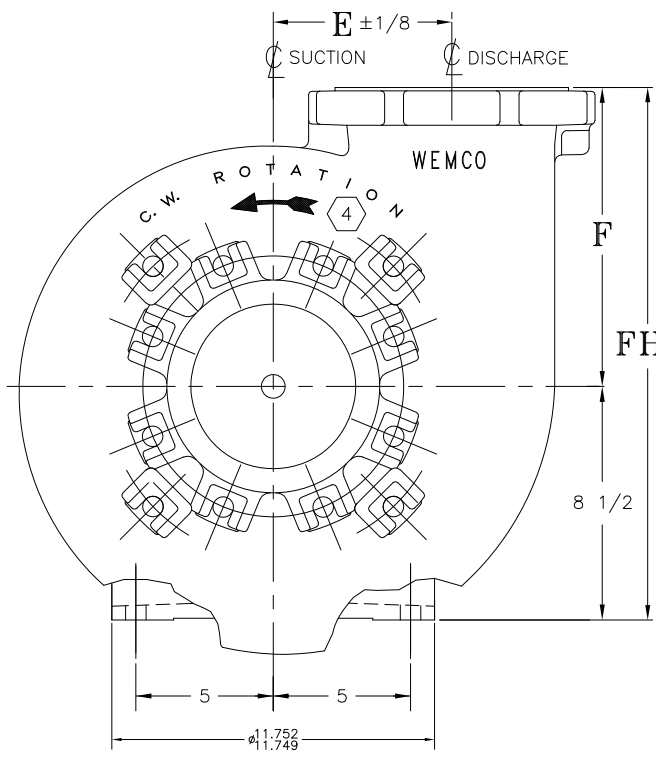
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NO.	BY	DATE	CHK'D	LCL EGN	INT'L EGN	DESCRIPTION	CERTIFIED FOR CONSTRUCTION	DWG. NO.	DESCRIPTION
								78145	

CUSTOMER			WEMCO® ROTO-JET®
USER			
SERIAL NO.			
CUSTOMER ORDER NUMBER	EPS SALES SHEET NO.	WEMCO® TORQUE-FLOW PUMP MODEL CE 4 x 11, GEN GENERAL ARRANGEMENT & ASSEMBLY	
DRAWN BY	DATE	CHG NO. P10CE-D212	SHEET 1 OF 2
CHECKED	DATE	SCALE NONE	SIZE D
APPROVED	DATE	P10CE-D212	

DRAWING NO. P10CE-D212



		WEMCO ROTO-JET	
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CAD NO. P10CE-D212-1 SHEET 2 OF 2			
SCALE	SIZE	REVISION	
NONE	D	P10CE-D212	
CHG			



PUMP SIZE ⁸	E	F	L	N	NX	MOTOR FRAMES	G	T	V	X	Z	CB	CC	CD	SHAFT CENTERS
2 x 2 x 11	6	10	3 1/2	32	42 5/8	182T-284T	25 3/4	5 1/4	5 3/8	17 1/2	20	10 1/4	47	45	18 3/8-23 3/4
						286T-365T	31	7 3/4	2 7/8	20	22 1/2	13	60	58	23 1/4-32
3 x 3 x 11	5 1/2	10	4 5/8	33	43 3/4	182T-284T	25 3/4	5 1/4	5 7/16	17 1/2	20	10 1/4	47	45	18 3/8-23 3/4
						286T-365T	31	7 3/4	2 15/16	20	22 1/2	13	60	58	23 1/4-32
4 x 4 x 11	6 1/2	10 7/8	4 3/4	33 5/8	44 3/8	182T-284T	25 3/4	5 1/4	5 15/16	17 1/2	20	10 1/4	47	45	18 3/8-23 3/4
						286T-365T	31	7 3/4	3 7/16	20	22 1/2	13	60	58	23 1/4-32
6 x 6 x 11	6 1/2	10 7/8	5 3/4	35 5/8	46 3/8	182T-284T	25 3/4	5 1/4	6 15/16	17 1/2	20	10 1/4	47	45	18 3/8-23 3/4
						286T-365T	31	7 3/4	4 7/16	20	22 1/2	13	60	58	23 1/4-32

NOTES:



1. DIMENSIONS ARE NOT FOR INSTALLATION PURPOSES UNLESS CERTIFIED.
2. PUMP AND ACCESSORIES ARE DESIGNED FOR CONTINUOUS DUTY.
3. WET END PARTS ARE ASSEMBLED IN THE AS CAST FORM. SUCTION AND DISCHARGE PIPING SHOULD BE FITTED TO THE PUMP FLANGES AFTER THE PUMP IS SET IN PLACE AND LEVELED. USE THICK NEOPRENE GASKETS OF 40 TO 60 DUROMETER (SHORE A).
4. PUMP ROTATION IS CLOCKWISE VIEWED FROM SHAFT END.
5. SUCTION AND DISCHARGE FLANGES MATE WITH STANDARD CLASS 150 ANSI FLANGES.
6. GAGE TAPS ARE NOT AVAILABLE DUE TO MATERIAL HARDNESS.
7. VENTS AND DRAINS CAN BE PROVIDED IF SPECIFIED.
- ⁸ PUMP SIZE INDICATES: SUCTION DIA. X DISCHARGE DIA. X IMPELLER DIA.
9. DIMENSIONAL TOLERANCE IS ± 1/16 UNLESS NOTED OTHERWISE.

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NO.	BY	DATE	CHK'D	LCL ECH	INT'L ECH	DESCRIPTION	CERTIFIED FOR CONSTRUCTION

REFERENCE	DWG. NO.	DESCRIPTION
	63313	

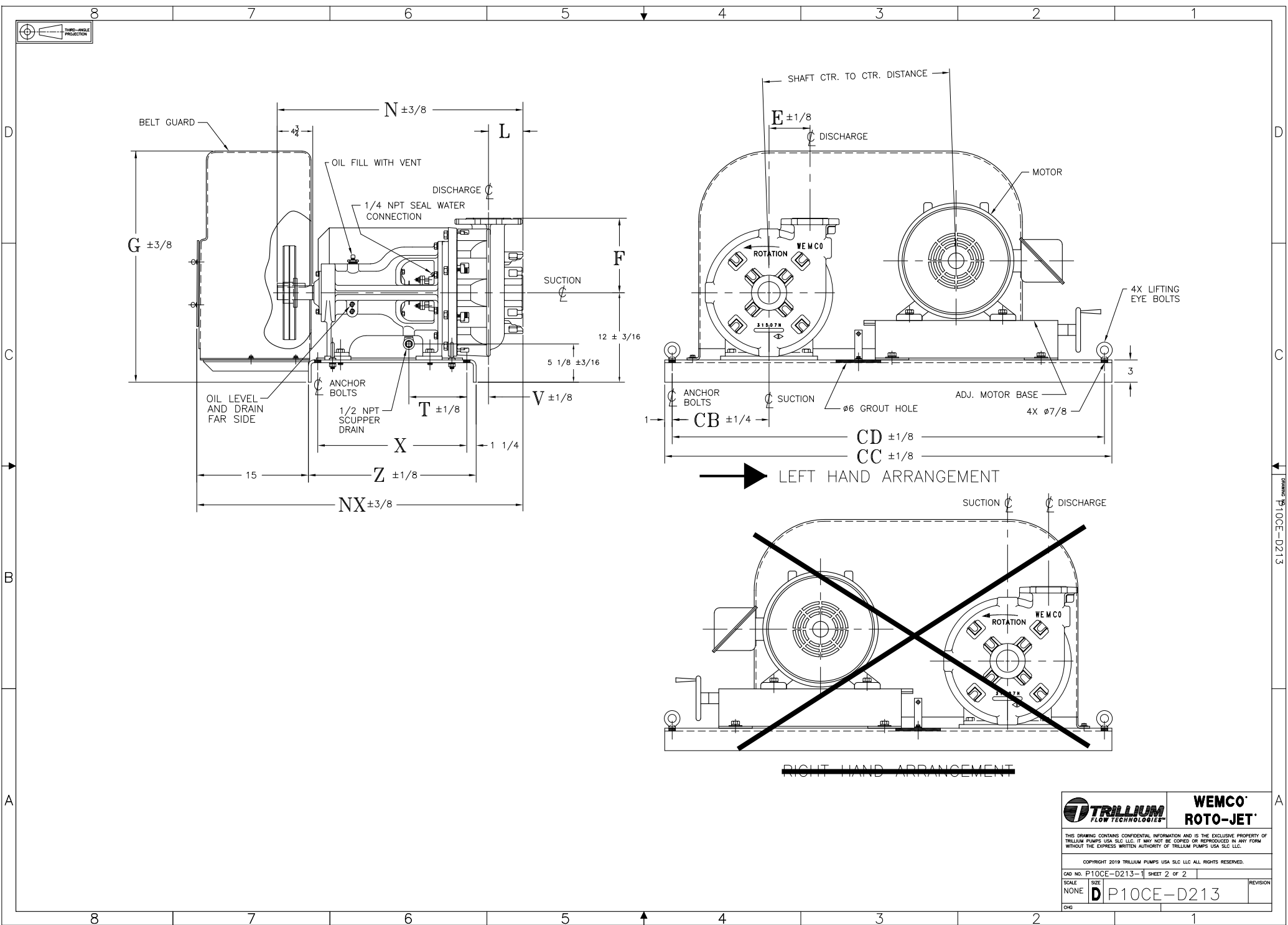
CUSTOMER	
USER	
SERIAL NO.	
CUSTOMER ORDER NUMBER	
EPS SALES SHEET NO.	
DRAWN BY	
CHECKED	
APPROVED	

WEMCO TORQUE-FLOW PUMP
 MODEL CE ⁸ 4 x 11
 GENERAL ARRANGEMENT & ASSEMBLY

DWG. NO. P10CE-D213 | SHEET 1 OF 2 | CODE NO. 7
 SCALE: NONE | SIZE: D | P10CE-D213

DRAWING NO. P10CE-D213



		WEMCO ROTO-JET	
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<small>CAD NO. P10CE-D213-1</small>		<small>SHEET 2 OF 2</small>	
<small>SCALE</small> NONE	<small>SIZE</small> D	<small>REVISION</small> P10CE-D213	
<small>CHG</small>		<small>REV</small>	



Trillium Flow Technologies
440 West 800 South
Salt Lake City, UT 84101-2229

T 801 359 8731
F 801 355 9303
www.trilliumflow.com

CAUTION

These pumps each have a special Flushless Slurry Mechanical Seal.

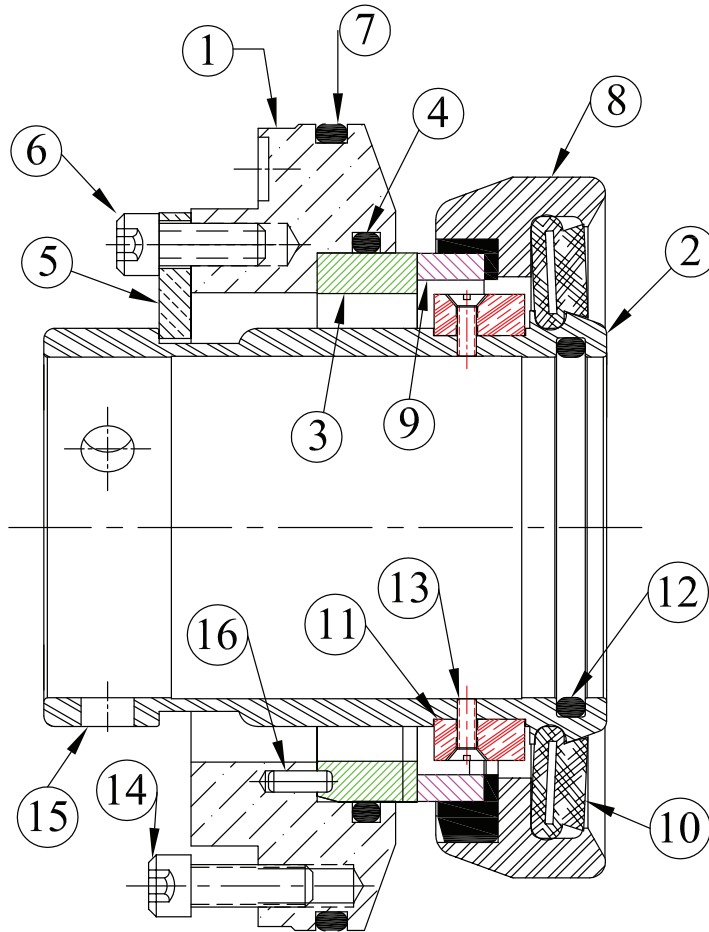
To prevent damage to the seal during transit and installation of the pumps, the seal setting plates are engaged, so the seal is not ready for operation.

Once the pumps are completely installed and no longer subject to vibration, jolting etc. that could damage the mechanical seal, the three setting plates per seal must be disengaged.

Disengaging the setting plates, item 5 in the attached drawing, is done by first making sure that the set screws, item 15, are tight. Then loosen the cap screws, item 6, for the setting plates, rotate the setting plates 180 degrees so they are no longer in the groove in the seal sleeve, item 2, and retighten the cap screws.

The seal is now set to its proper factory setting.

After making sure the seal faces are wetted (there is fluid in the pump and air has been vented). It is now safe to start the pump.



DATA SHEET AND BILL OF MATERIAL

ITEM	QTY.	DESCRIPTION	PART #	MATERIAL
28				
27				
26				
25	1	Adapter		As Specified
24				
23				
22				
21				
20				
19				
18				
17	3	Drive Pin (Hidden)	470004	316 SS
16	1	Anti Rotation Pin	470003	316 SS
15	3	3/8" x 3/8" SHSS	280032	316 SS
14	3	1/4"-20 x 1" SHCS	280004	18-8 SS
13	2	Drive Key Screw	280020	18-8 SS
12	1	O-Ring [Sleeve]	300226	Viton
11	2	Drive Key	460001	316 SS
10	1	Cone Spring	200066	Viton
9	1	Rotary Face	240010	TC/VITON
8	1	Rotary Body	220011	316 SS
7	1	O-Ring [Stationary O.D.]	300246	Viton
6	3	1/4"-20 x 7/8" SHCS	280005	18-8 SS
5	3	Setting Plates	340003	316 SS
4	1	O-Ring [Faces]	300236	Viton
3	1	Stationary Face	260001	SIC
2	1	Seal Sleeve	402000-MOD-G	316 SS
1	1	Stationary Carrier	120005	316 SS



ISSUE DATE: _____
INITIALS: RNS

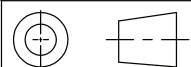
ISSUED FOR:

<input type="checkbox"/> APPROVAL	<input type="checkbox"/> MARKUP
<input type="checkbox"/> BID	<input type="checkbox"/> QUOTE
<input type="checkbox"/> CONSTRUCTION	<input type="checkbox"/> REFERENCE
<input checked="" type="checkbox"/> FINAL	<input checked="" type="checkbox"/> SHOP USE ONLY

SPECIAL INSTRUCTIONS:

DESTROY DRAWINGS UPON COMPLETION

RETURN FOR CORRECTIONS



UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES. MACHINED FILLET RADIUS 0.015" - 0.050". BREAK ALL SHARP EDGES 0.010" - 0.030" RADIUS OR 45° CHAMFER. CONCENTRICITY TO BE WITHIN 0.005" TIR. SURFACE FINISH IN MICRO INCHES (Ra). SEE B/M FOR MATERIAL AND SPECIAL REQUIREMENTS.

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Tolerance Unless Otherwise Specified		
INCH	[MM]	OTHER
0.X +/- 0.100*	[0.] +/- [2.54]	ANGLES +/- 1/2°
0.XX +/- 0.020*	[0.X] +/- [.508]	
0.XXX +/- 0.005*	[0.XX] +/- [.127]	

DO NOT SCALE

Drawn By: Ricky Sanchez Date: 6/16/2009

Checked By: Patrick Malloy Date: 6/16/2009

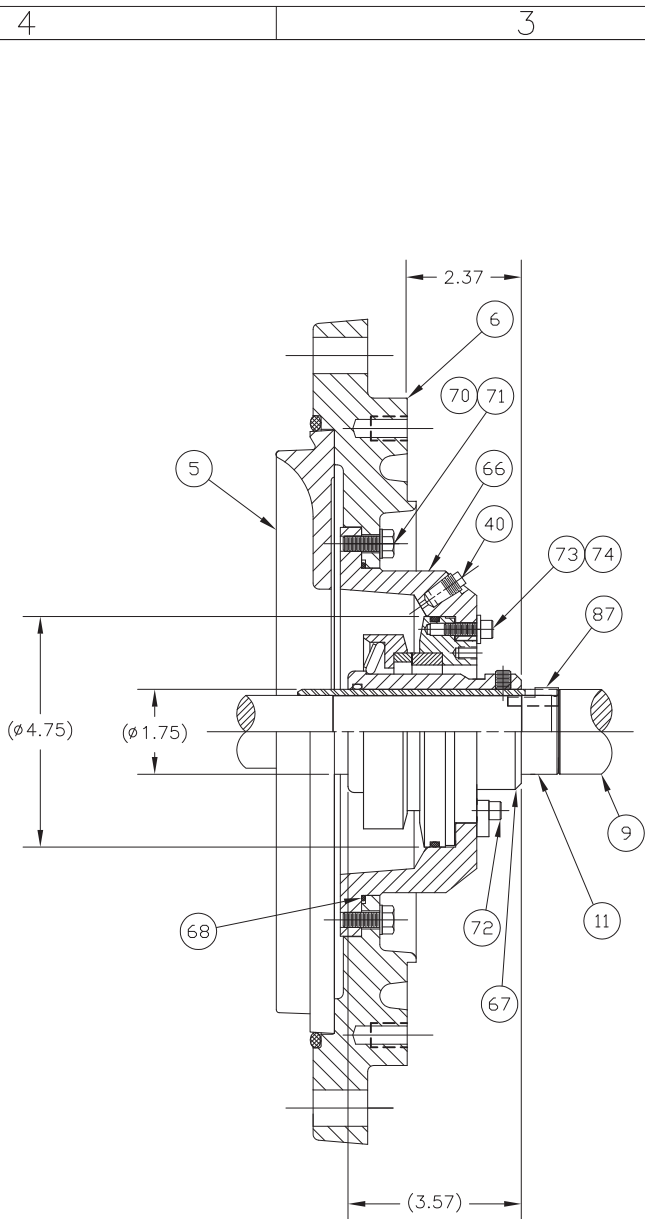
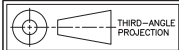
Approved By: Patrick Malloy Date: 6/16/2009

MATERIAL: 316 SS

Slurry Dynamics International, Inc.
47149 Conrad Anderson Dr. Hammond, LA 70401
PH. 985-419-8841 FAX 985-419-8859

TITLE: PANACEAL STANDARD DESIGN GROUP: [A]

SCALE: = NONE REV. 1 DWG NO: PSC2000A-SS-VI-GRV-TC/SIC



ASS'Y	QTY	ITEM NO.	PART NO.	DESCRIPTION	MAT'L	UNIT WT.
	1	5		WEARPLATE	NI-HARD	
	1	6		BACKPLATE	GRAY IRON	
	1	9		SHAFT	VARIES	
	1	11		SLEEVE, SHAFT	SST	
	1	40		PLUG, 1/8 NPT	SST	
	1	66		ADAPTER	VARIES	
	1	67		SEAL, SLURRY DYNAMICS MECHANICAL	SS/VITON	
	1	68		O-RING, 6.737 ID X .103CW	BUNA-N	
	8	70		BOLT, HEX HD. 5/16-18UNC X 7/8	316SST	
	8	71		5/16 SEALANT WASHER	SST/NEOP	
	3	72		SCREW, CAP SDC HD. 1/4-20UNC X 1/2	316SST	
	3	73		SCREW, CAP SDC HD 1/4-20UNC X 3/4	316SST	
	3	74		WASHER, LOCK 1/4	316SST	
	1	87		KEY, PER DWG 64664	VARIES	

NOTES:

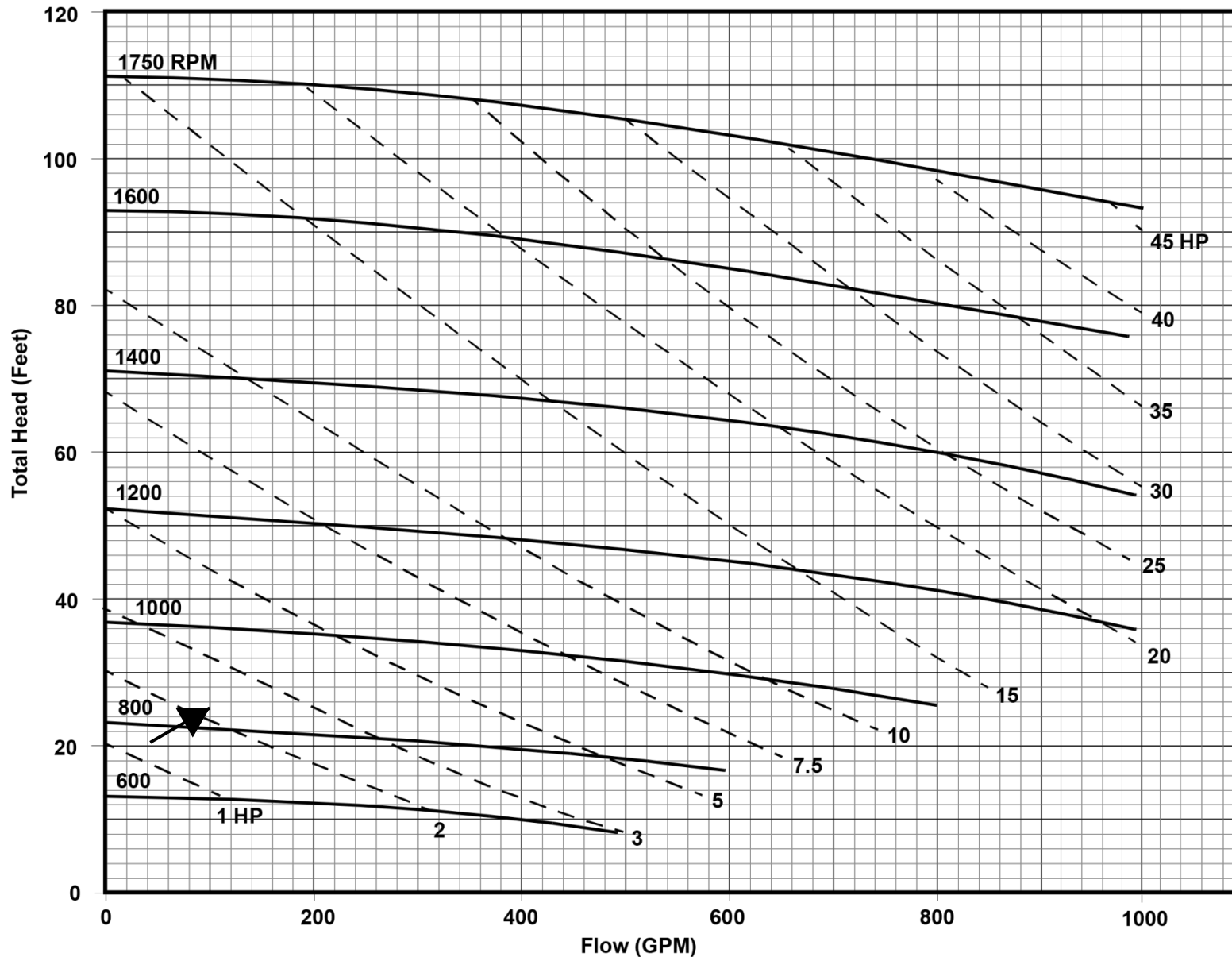
1 REFER TO SLURRY DYNAMICS INTL PANACEAL INSTALLATION INSTRUCTIONS FOR SEAL INSTALLATION.

NO.	BY	DATE	CHK'D	LCL ECN	INT'L ECN	DESCRIPTION
-	ens	08/02	RF	53830	-	FIRST ISSUE

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COPYRIGHT 2002 ENVIROTECH PUMPSYSTEMS, INC. ALL RIGHTS RESERVED.		USER	
CERTIFIED FOR CONSTRUCTION		SERIAL NO.	
DATE	BY	CUSTOMER ORDER NUMBER	EPS SALES SHEET NO.
DRAWN BY	DATE	MECH SEAL NON-FLUSH 'CEV'	
ens	1AUG02		
CHECKED	DATE		
R. FIFE	11-7-02		
APPROVED	DATE		
R. FIFE	11-8-02		

**MECHANICAL SEAL DETAIL
SLURRY DYNAMICS SEAL
11" MODEL 'CE' & 'CEV'
TORQUE-FLOW PUMP**

CAD NO. 700418-1	SHEET 1 OF 1	CODE NO. 384/AOZ 300
SCALE 1:2	SIZE C	DWG NO. 700418
		REVISION -



Suction: 4"
Discharge: 4"
Impeller Dia: 11"
Max Sphere Size: 4.0"

$$BHP = \frac{GPM \times FT \times SG}{3960 \times Efficiency}$$

$$kW = \frac{M^3/hr \times M \times SG}{367 \times Efficiency}$$

The brake horsepower and efficiency shown is for properly installed and lubricated packing. Pumps with mechanical seals will require additional horsepower and the factory may be contacted for these values. Certified tests are performed using Hydraulic Institute acceptance grade 2B.

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Clear Water Performance

November 2019

Variable RPM

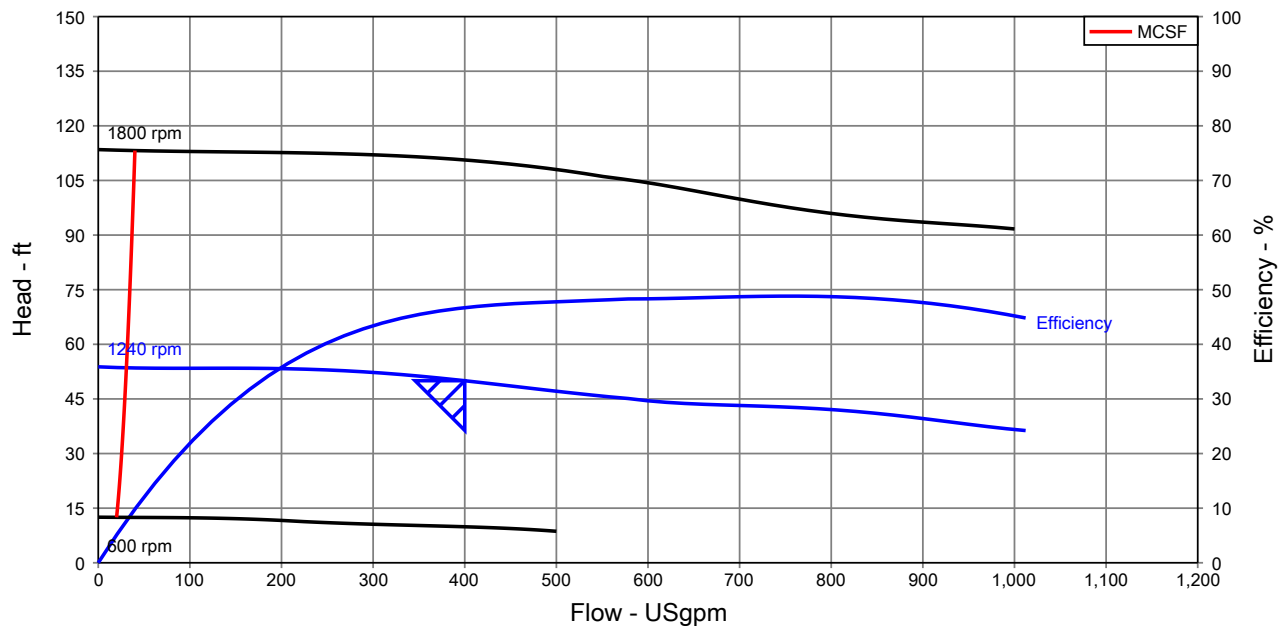
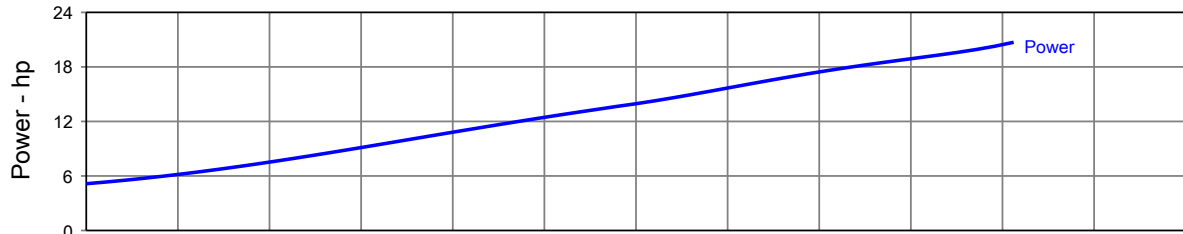
P10CE-D43

4x11 CE

Pump Performance Datasheet

Customer	: Wescor Associates Inc.	Quote number	: 1441511
Customer reference	:	Size	: 4x11 Model CE
Item number	: 001	Stages	: 1
Service	: Section 11312 Primary Sludge Pumps	Based on curve number	: 4x11CE_P10CE-D43
Quantity	: 4	Date last saved	: 21 Jul 2021 11:35 AM

Operating Conditions		Liquid	
Flow, rated	: 400 USgpm	Liquid type	: User defined
Differential head / pressure, rated (requested)	: 50.0 ft	Additional liquid description	:
Differential head / pressure, rated (actual)	: 49.8 ft	Solids diameter, max	: 4.00 in
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Solids concentration, by volume	: 0.00 %
NPSH available, rated	: Ample	Temperature, max	: 68.00 deg F
Site Supply Frequency	: 60 Hz	Fluid density, rated / max	: 1.000 / 1.000 SG
Performance		Viscosity, rated	: 1.00 cP
Speed criteria	: Synchronous	Vapor pressure, rated	: 0.00 psi.a
Speed, rated	: 1240 rpm	Material	
Speed, maximum	: 1800 rpm	Material selected	: Standard
Speed, minimum	: 600 rpm	Pressure Data	
Efficiency	: 46.70 %	Maximum working pressure	: 23.30 psi.g
NPSH required / margin required	: - / 0.00 ft	Maximum allowable working pressure	: 85.00 psi.g
Ns (imp. eye flow) / Nss (imp. eye flow)	: 1,802 / - US Units	Maximum allowable suction pressure	: N/A
MCSF	: 30.7 USgpm	Hydrostatic test pressure	: N/A
Head maximum, rated speed	: 53.8 ft	Driver & Power Data (@Max density)	
Head rise to shutoff	: 7.64 %	Driver sizing specification	: Rated power
Flow, best eff. point	: 755 USgpm	Margin over specification	: 0.08 %
Flow ratio, rated / BEP	: 52.96 %	Service factor	: 1.00
Speed ratio (rated / max)	: 68.89 %	Power, hydraulic	: 5.05 hp
Head ratio (rated speed / max speed)	: 45.19 %	Power, rated	: 10.81 hp
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00	Power, maximum, rated diameter	: 20.71 hp
Selection status	: Acceptable	Minimum recommended motor rating	: 15.00 hp / 11.19 kW





Trillium Pumps USA SLC LLC (Seller)

LIMITED WARRANTY

COVERAGE: Seller warrants its products to be free from defects in materials and workmanship when operated under the normal conditions for which the products were designed.

WARRANTY PERIOD: This warranty covers a period of twelve (12) months from the date product was placed into service, or eighteen (18) months from the date of shipment, whichever occurs first.

REMEDIES: If the product fails due to defective materials or workmanship within the warranty period, Trillium's sole obligation after verification of the defect, shall be, at its discretion, the repair or replacement of the product. **THIS PARAGRAPH PROVIDES THE EXCLUSIVE REMEDIES FOR ALL CLAIMS BASED ON FAILURE OF OR DEFECT IN A PRODUCT, WHETHER THE FAILURE OR DEFECT ARISES BEFORE, DURING, OR AFTER THE APPLICABLE WARRANTY PERIOD AND WHETHER A CLAIM, HOWEVER DESCRIBED, IS BASED ON CONTRACT, WARRANTY, INDEMNITY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY, OR OTHERWISE, AND IS SUBJECT TO ALL LIMITATIONS OF LIABILITY FOUND HERE OR ELSEWHERE IN THE TERMS AND CONDITIONS.**

OWNER'S OBLIGATIONS: Owner shall notify Seller of a defect within ten (10) days of its discovery. At the Owner's expense, the defect may be verified at Owner's site, at Seller's authorized facility, or by returning the product to Seller's factory.

EXCLUSIONS: This warranty does not apply to consumable items that are normally replaced during maintenance; and defects resulting from improper installation, operation, maintenance, storage, neglect, or accident. This warranty does not cover any expense for repairs or alterations performed outside Seller's factory without Seller's prior authorization. Equipment and accessories not manufactured by Seller are warranted only by the original manufacturer's warranty. Seller shall not be liable for costs of removal, transportation, or reinstallation of products. Seller shall not be liable for any consequential, special, incidental, or indirect damages or delays resulting from or related to defective products.

SELLER MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, AND DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, AND ANY IMPLIED WARRANTY THAT COULD ARISE FROM COURSE OF DEALING OR USAGE OF TRADE. SELLER ALSO DISCLAIMS ALL STATUTORY WARRANTIES.



Trillium Flow Technologies
440 West 800 South
Salt Lake City, UT 84101-2229

T 801 359 8731
F 801 355 9303
www.trilliumflow.com

TB WOOD'S V-BELT STRUCTURE SELECTION

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QTY/PER</u>	<u>UM</u>
05205	SHEAVE, 5" \times 11.3" 2GR	1.	EA
161059	SHEAVE, VS-210-2 1-7/8" BORE	1.	EA
802215	V-BELT 5"X-690	2.	EA

<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QTY/PER</u>	<u>UM</u>
491435	BUSHING, SK 1-7/8 BORE	1.	EA



Phone: (888) 829-6637
 Fax: (717) 264-6420
 Email: mechanical@tbwoods.com
 www.tbwoods.com

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Prepared By: Sarah Cleaver
Company: Weir Specialty Pumps
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Email: sarah.cleaver@mail.weir
Drive Name: Taunton, MA

Date Created: 10/4/2021, 11:39:27 AM **ID:** 324375-6

CAUTION: This solution is calculated exclusively using TB WOOD'S products. Substitution of alternate components and/or material may result in failure.

Showing entry speed, 2 x longer belt

Bill of Materials

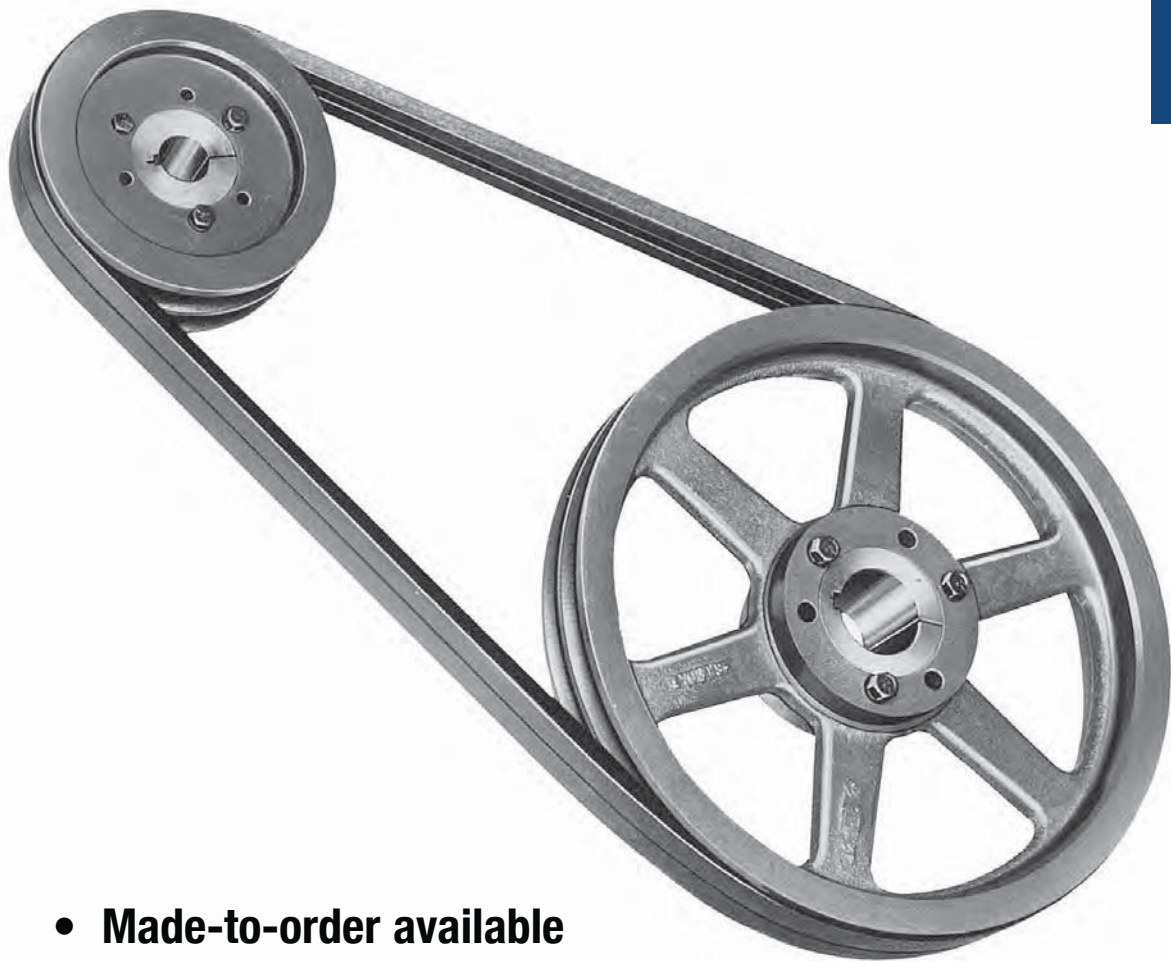
	Description	Part Number	Quantity	Weight (lbs)
DR Sheave	JVS-210-2x1 7/8	JVS2102178	1	23
DN Sheave	<u>5V11.3X2-SK</u>	5V1132	1	16.4
Belt(s)	<u>5VX690</u>	5VX690	2	1.6
DN Bushing	<u>SKx1 7/8</u>	SK178	1	2.4
			5	43

Application Details @entry speed, 2 x longer belt

	Input	Actual	% Change	Comments
Service Factor	1.50	1.79	19.3%	
Input Power (HP)	25.0			NEMA Motor Specs. DO Apply (284T)
Design Power (HP)	37.5	44.9	19.7%	Overall width dR is 4.13 in.; Face width dN is 1.69
				Actual DriveR O.D. is 8.27 in.; Pitch is 7.92 in.
DR RPM	1770.0			
DR Shaft (in)	1.875			
Nominal DR torque (in-lb)		890		
Adjustment		1.44 turns		About 1 3/8 turns
				Actual DriveN O.D. is 11.30 in.
DN RPM	1240.0	1240.0	0.0%	
DN Shaft (in)	1.875			
Nominal DN torque (in-lb)		1271		
Speed Range		1062 - 1286		
Speed Ratio	1.43	1.43	0.0%	
Belt Speed (FPM)		3668		
Min. Arc of Contact		171.0°		
Center Distance (in)	20.5	19.33	-5.7%	Center distance adjustments allowances
		18.33	-5.2%	-1.0 adjustment for installation (in)
		20.53	6.2%	+1.2 adjustment for tensioning (in)
C.D. Range		19.11 - 20.17		
Belt Tension (per strand)				Dynamic hubloads generated
Deflection (in)		0.30		
Force (min lbs)		9.91	produces	525 lbs hubload
Force (max lbs)		14.45	produces	815 lbs hubload
Sonic Tension				
Minimum Frequency	69.49 Hz			
Maximum Frequency	85.11 Hz			

Narrow (Ultra-V) Sheaves

B1

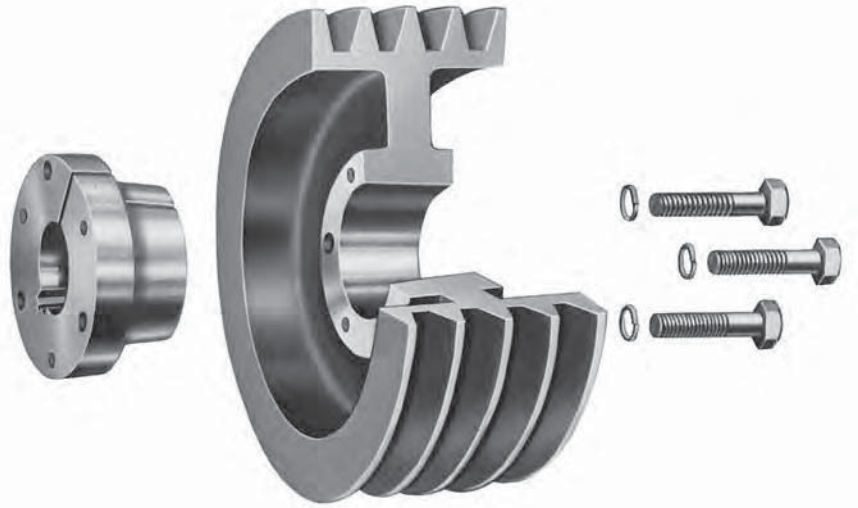


- **Made-to-order available**
- **Are Easy to Install and Remove**
- **Bored to suit construction**

Sure-Grip® Narrow (Ultra-V) Sheave

Features

Wood's Ultra-V sheaves are constructed of fine grain, high tensile cast iron, and have been carefully engineered to assure maximum performance over a long life span. Behind each sheave is one of the most extensive engineering design and testing programs in the industry.



With the advent of higher V-belt ratings, Wood's engineers instituted additional careful test programs to ensure that each Wood's sheave would be capable of safely and dependably delivering the increased performance which was required by the new ratings. Wood's engineers, using a special strain gage test stand, subject sheaves to tension and compression stresses far in excess of those encountered in actual operation.

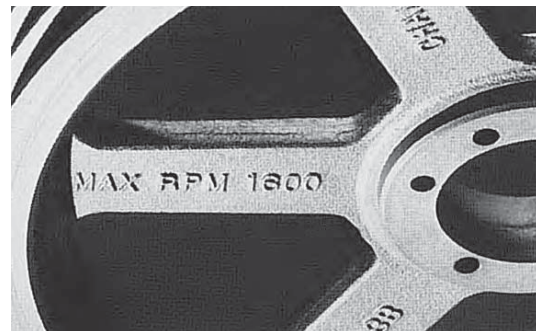
In another standard test procedure, Wood's sheaves are operated at extremely high speeds. Sheaves are selected from warehouse stocks and tested until they are burst by centrifugal force. Such destructive testing allows Wood's engineers to study the effects of construction and balance on sheave performance. The goal is to assure safe operation at normal speeds. Other continuing programs check product quality in the laboratory and on the manufacturing line.

For applications with special requirements, Wood's sheaves are also available on a made-to-order basis in either cast or ductile iron, and in Sure-Grip or bored-to-suit construction.

Wood's stock narrow sheaves are available with the convenient Sure-Grip QD type bushing. Easy to install and remove, these split, tapered bushings grip the shaft with the equivalent of a shrink fit. This tight holding power eliminates freezing and fretting

corrosion between the shaft and the bore and assures quick removal and interchangeability when necessary.

Stock sheaves are designed to carry the loads of all belts shown in this catalog and other similarly rated V-Belts. For special higher rated V-Belts, consult Wood's Engineering Department for recommendations.

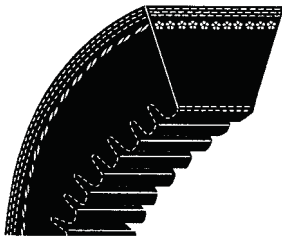
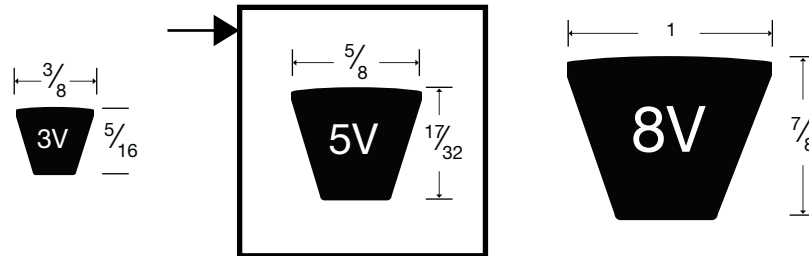


We cast or stamp the maximum safe operating speed, in rpm, on all sheaves we manufacture.

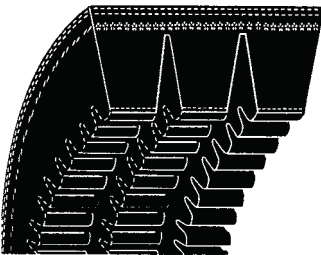
Narrow (Ultra-V) V-BELT

Features

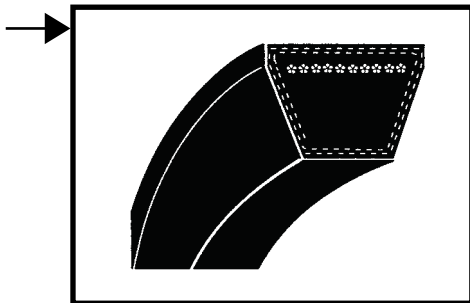
The three cross sections of Wood's Narrow (Ultra-V) belts transmit more horsepower than the five sizes of the Classical (Conventional) V-belt. The narrower geometry of the belt results in cross sections that are up to 50% smaller than the Classical (Conventional) cross sections. This allows the use of smaller diameter sheaves resulting in more compact, lighter weight drives that can operate at higher speeds, reduce bearing loads, and shaft stresses. All Wood's Narrow (Ultra-V) belts are static conducting, and oil and heat resistant.



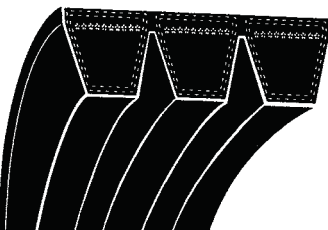
Narrow (Ultra-V) Cog V-belts . . . a premium raw edge, cog construction at no extra cost. Up to 30% more horsepower capacity than wrapped belts. The molded cogs offer greater flexibility and better heat dissipation, especially important on drives using smaller diameter sheaves and short center distances. Stock in all 3V lengths, 5V and 8V lengths up to 200 inches.



Narrow (Ultra-V) Cog Banded V-belts . . . all the same features of the individual Narrow (Ultra-V) Cog belt, but with the added benefit of multiple belts in a single belt. Should be considered for those problem drives where long center distance, vibration, pulsating or shock loads cause individual belts to whip, turn over, or jump out of sheave grooves. Stock in all 3V and 5V, 2 thru 5 ribs in lengths up to 200 inches.



Narrow (Ultra-V) V-belts . . . wrapped construction of 5V and 8V belts over 200 inches long. Handles applications that require longer length belts or larger cross sections where flexibility and compactness are not as critical.

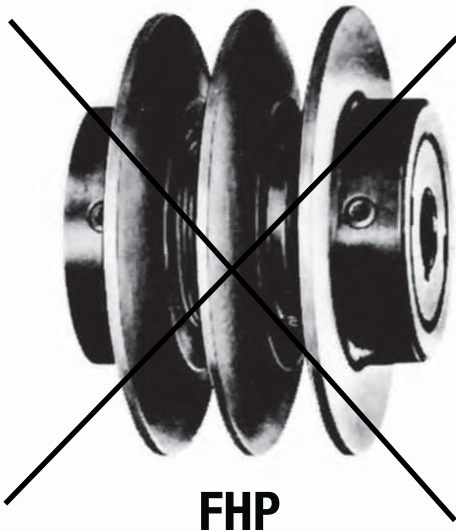


Narrow (Ultra-V) Banded V-belts . . . wrapped construction of 5V belts over 200 inches and all 8V section belts. Can be used on those same problem drives as the Narrow (Ultra-V) Cog Banded belts. Stocked in 2 thru 5 ribs (5V section) and 3 thru 5 ribs (8V section).

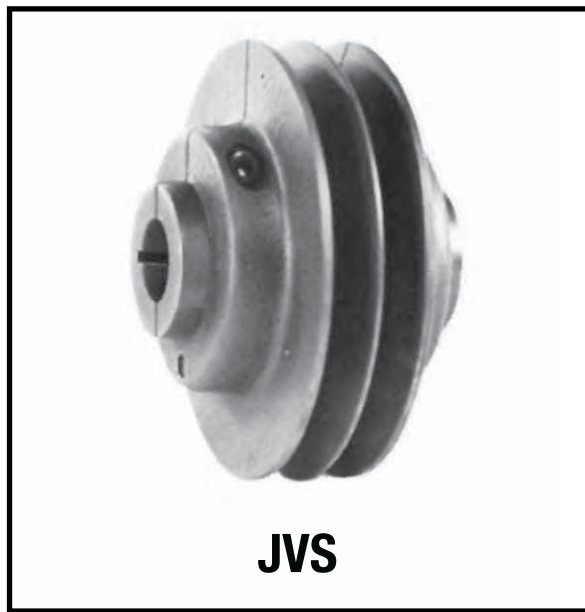
Warning: Do not mix raw edge cog and wrapped construction belts on the same drive.

V-Belt Adjustable Pitch Sheaves

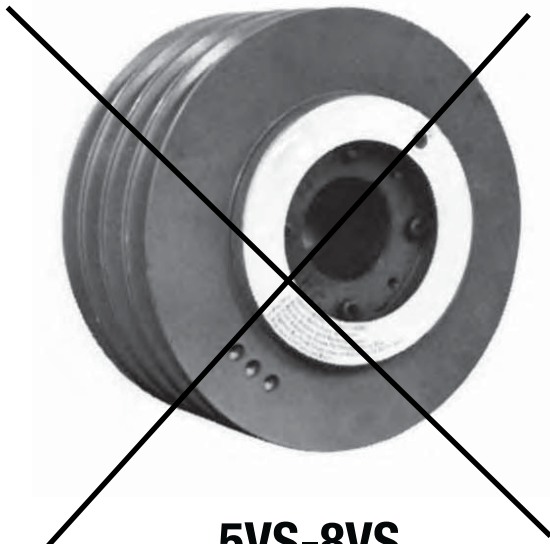
D2



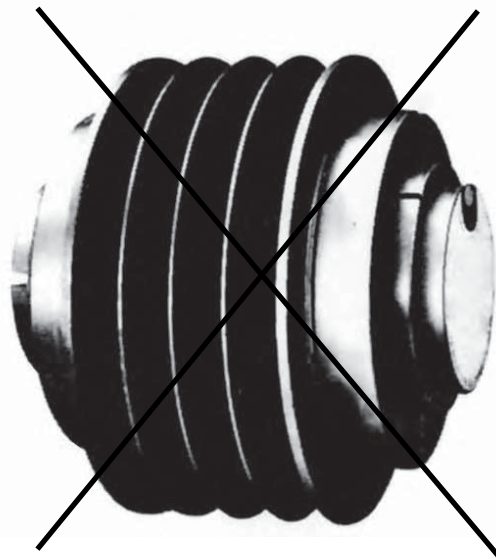
FHP



JVS



5VS-8VS

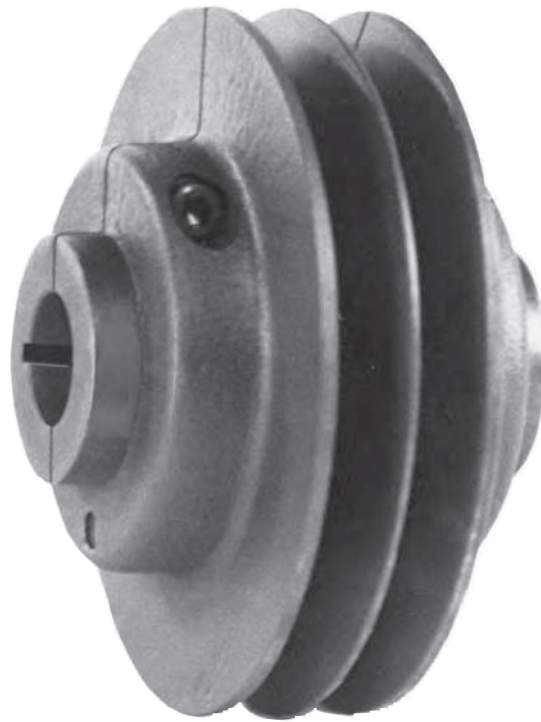


SVS

JVS Adjustable Speed Sheaves

Features

- **For A-B or 5V Belts**
- **Up to 40 HP @ 1750 rpm**
- **Needs No Lubrication**
- **Won't Freeze or Stick**
- **Wider Speed Range**



Wood's JVS stationary control, adjustable speed sheaves offer several significant advantages. This sheave is available in 6 sizes from 5.118 inches (130 mm) to 9.055 inches (230 mm) in diameter. It uses Classical A and B belts and Narrow 5V belts. Capacities range up to 40 hp at 1750 rpm. Its speed is infinitely variable, and because one screw controls both moveable flanges, accurate groove spacing is assured at all times. It uses a clamping collar design with no threads on either the sleeve or the flanges, so there is no chance of fretting corrosion and sticking. No lubrication is needed.

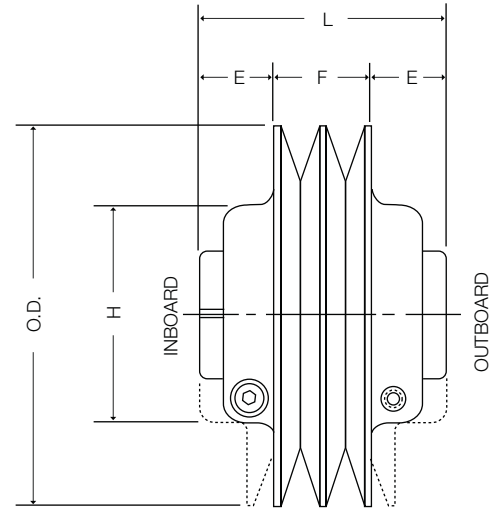
JVS Adjustable Speed Sheaves

Dimensions

Product No.	Stock Bores	Max. Bore
JVS1302	1-1/8, 1-3/8	1.3750
JVS1502	1-1/8, 1-3/8, 1-5/8	1.6875
JVS1702	1-1/8, 1-3/8, 1-5/8	1.6875
JVS1902	1-3/8, 1-5/8, 1-7/8	2.4375
JVS2102	1-3/8, 1-5/8, 1-7/8, 2-1/8	2.4375
JVS2302	1-3/8, 1-5/8, 1-7/8, 2-1/8	2.4375

Product No. Example:

JVS1302 with 1-3/8" Bore = JVS1302138 (Product No.)

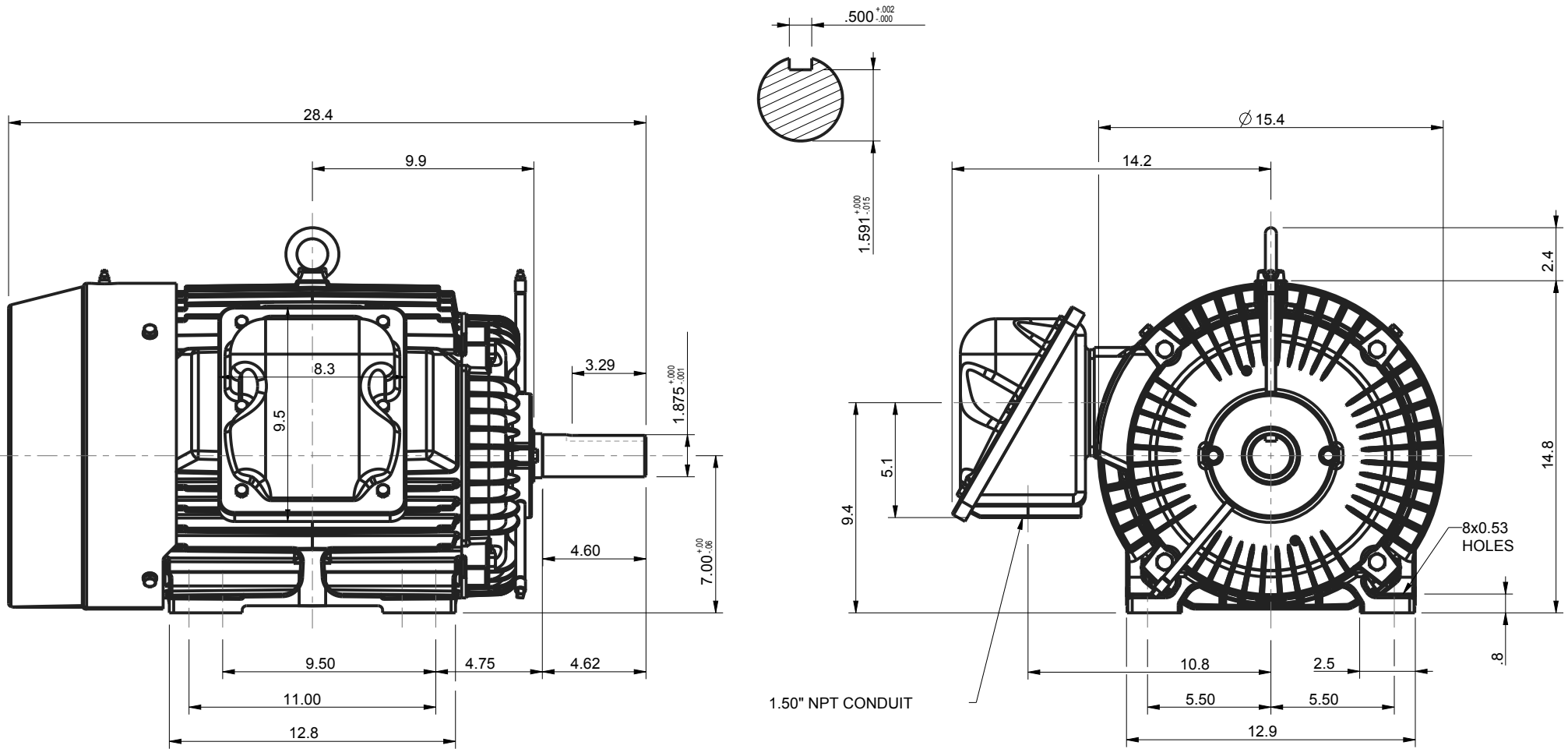


Product No.	PITCH DIA. RANGE			O.D.	DIMENSIONS						WT. (Lbs.)
	A Belts	B Belts	5V Belts		L	F		E		H	
						Min.	Max.	Min.	Max.		
JVS1302	3.86 - 4.58	4.22 - 5.14	-	5.12	3.77	1.73	2.27	.75	1.02	3.19	8.0
JVS1502	4.44 - 5.36	4.49 - 5.92	4.41 - 5.84 †	5.90	4.13	1.73	2.59	.77	1.20	3.62	11.0
JVS1702	5.13 - 6.15	5.5 - 5.28	5.2 - 6.63 †	6.69	4.13	1.73	2.59	.77	1.20	3.62	13.5
JVS1902	5.92 - 6.94	5.5 - 6.07	5.99 - 7.42	7.48	4.13	1.73	2.59	.77	1.20	5.09	20.0
JVS2102	6.71 - 7.73	5.5 - 6.87	6.78 - 8.21	8.27	4.13	1.73	2.59	.77	1.20	5.09	23.0
JVS2302	7.15 - 8.52	5.5 - 7.65	7.57 - 9.00	9.06	4.13	1.73	2.59	.77	1.20	5.09	26.0

Note: JVS sheaves use standard 2 Groove "B" or "5V" sheaves as companions.

† Recommended for use with Narrow Cog Belts only.

Note: One turn of the adjusting screw varies the pitch .2". Maximum to minimum adjustment requires seven turns.



UNITS: INCHES

ROTATION FROM NDE

<input checked="" type="checkbox"/> CCW	<input type="checkbox"/> CW

NOTES:

1. MAIN CONDUIT BOX MAY BE ROTATED IN 90° INCREMENTS
2. STANDARD PRODUCT USES BI-DIRECTIONAL FAN. OPPOSITE ROTATION AVAILABLE ONLY BY CONNECTION CHANGE.
3. KEY DIMENSIONS EQUAL 0.500"x 0.500"x 3.25" (MOTOR SUPPLIED WITH KEY)

TOSHIBA RESERVES THE RIGHT TO MAKE CHANGES OF TECHNICAL IMPROVEMENT AND THE DATA MAY CHANGE WITHOUT NOTICE

PRELIMINARY

DO NOT USE FOR CONSTRUCTION, INSTALLATION, OR APPLICATION PURPOSES UNLESS THE DRAWING IS MARKED AS CERTIFIED

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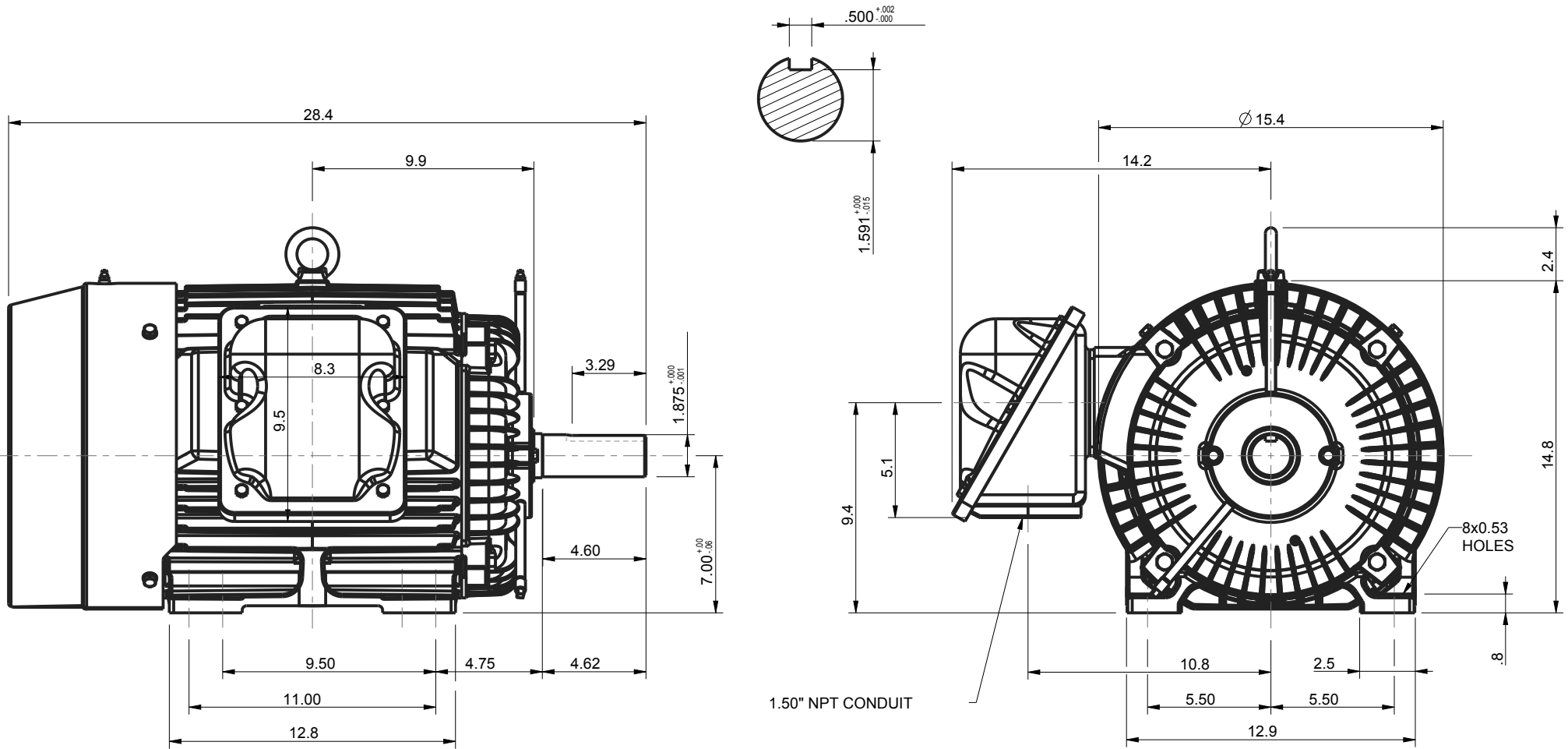
TOSHIBA INTERNATIONAL CORPORATION

TOTALLY ENCLOSED FAN COOLED
HORIZONTAL FOOT MOUNTED
3 PHASE INDUCTION MOTOR
284T-286T F1 ASSEMBLY

DRAWING #: MDSL001-05

REV. DATE: 07/03/18 REV. #: 0 PER.: M. O'DOWD

REV. DESCRIP.:



UNITS: INCHES

ROTATION FROM NDE

CCW
 CW

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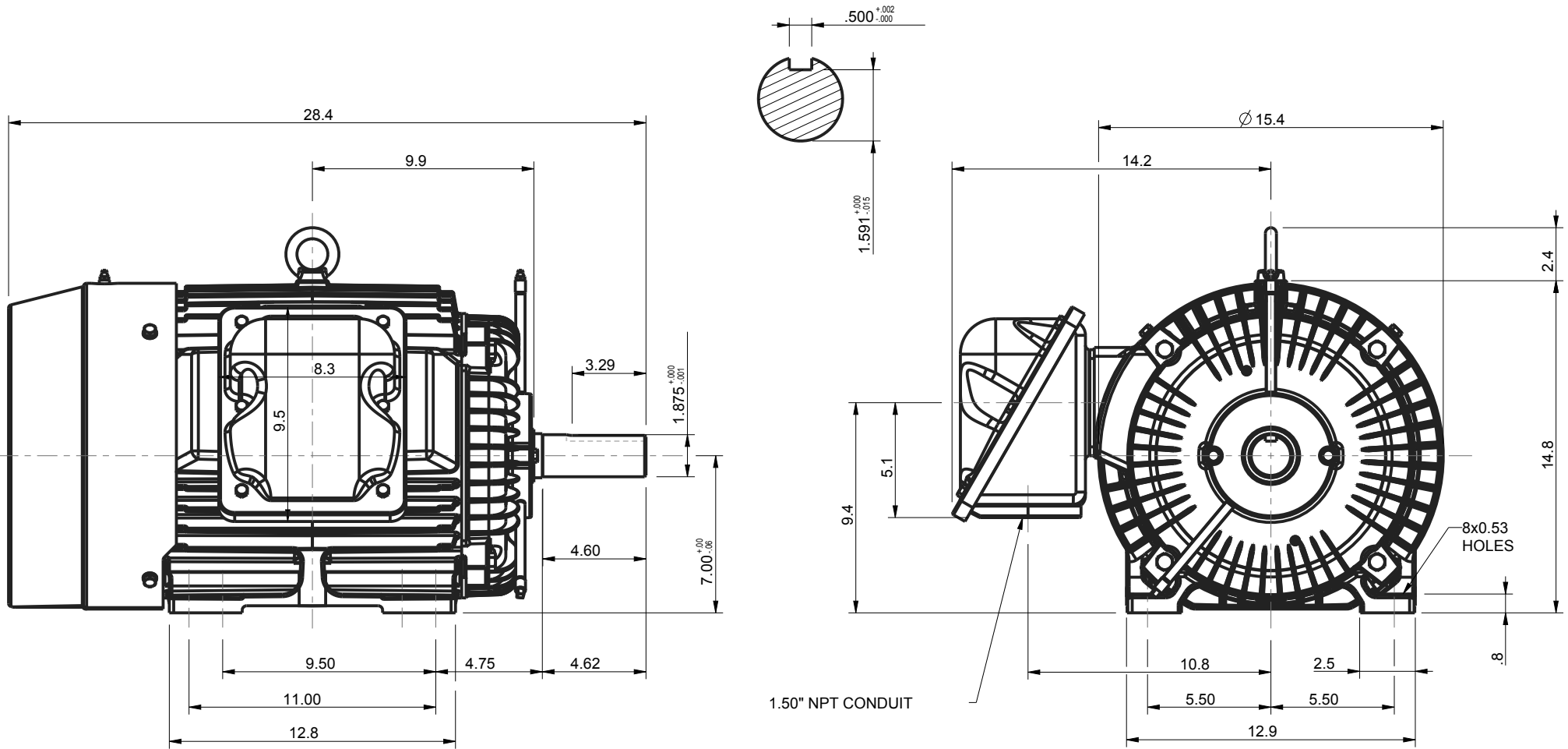
TOSHIBA INTERNATIONAL CORPORATION

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TOTALLY ENCLOSED FAN COOLED
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284T-286T F1 ASSEMBLY

DRAWING #: MDSL001-05

REV. DATE: 07/03/18 REV. #: 0 PER.: M. O'DOWD

REV. DESCRIP.:



Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

TYPICAL MOTOR PERFORMANCE DATA

Model: 0254SDSR41A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
25	18.5	4	1770	284T	230/460	60	3	62/31
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.15	CONT	93.6	B	G	40 C

Load	HP	kW	Amperes	Efficiency (%)	Power Factor (%)
Full Load	25	18.6	31.0	93.8	83.5
¾ Load	18.75	14.0	23.8	93.1	80.5
½ Load	12.50	9.3	18.3	91.4	73.0
¼ Load	6.25	4.7	14.1	84.0	49.3
No Load			11.0		5.6
Locked Rotor			182		34.3

Torque				Rotor wk ² Inertia (lb-ft ²)
Full Load (lb-ft)	Locked Rotor (% FLT)	Pull Up (% FLT)	Break Down (% FLT)	
74.2	190	165	295	5.23

Safe Stall Time(s)		Sound Pressure dB(A) @ 1M	Bearings*		Approx. Motor Weight (lbs)
Cold	Hot		DE	NDE	
35	15	-	6310ZC3	6310ZC3	492

*Bearings are the only recommended spare part(s).

Motor Options:
 Product Family:EQP Global SD
 Mounting:Footed,Shaft:T Shaft

Customer	
Customer PO	
Sales Order	
Project #	

Tag:

All characteristics are average expected values.

TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	jhock	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1119 / 1
Engr. Date	3/13/2014	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019



Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

TYPICAL MOTOR PERFORMANCE DATA

Model: 0254SDSR41A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
25	18.5	4	1460	284T	190/380	50	3	72/36
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.0	CONT	91.7	B	G	40 C

Load	HP	kW	Amperes	Efficiency (%)	Power Factor (%)
Full Load	25	18.6	36.0	93.8	83.8
¾ Load	18.75	14.0	27.7	94.4	80.9
½ Load	12.50	9.3	20.0	94.2	73.4
¼ Load	6.25	4.7	13.7	85.3	60.5
No Load			10.8		5.1
Locked Rotor			215		35.0

Torque				Rotor wk ²
Full Load (lb-ft)	Locked Rotor (% FLT)	Pull Up (% FLT)	Break Down (% FLT)	Inertia (lb-ft ²)
89.9	150	135	230	5.23

Safe Stall Time(s)		Sound Pressure dB(A) @ 1M	Bearings*		Approx. Motor Weight (lbs)
Cold	Hot		DE	NDE	
26	13	-	6310ZC3	6310ZC3	492

*Bearings are the only recommended spare part(s).

Motor Options:
 Product Family:EQP Global SD
 Mounting:Footed,Shaft:T Shaft

Customer	
Customer PO	
Sales Order	
Project #	

Tag:

All characteristics are average expected values.

TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	jhock	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1119 / 1
Engr. Date	3/25/2014	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019



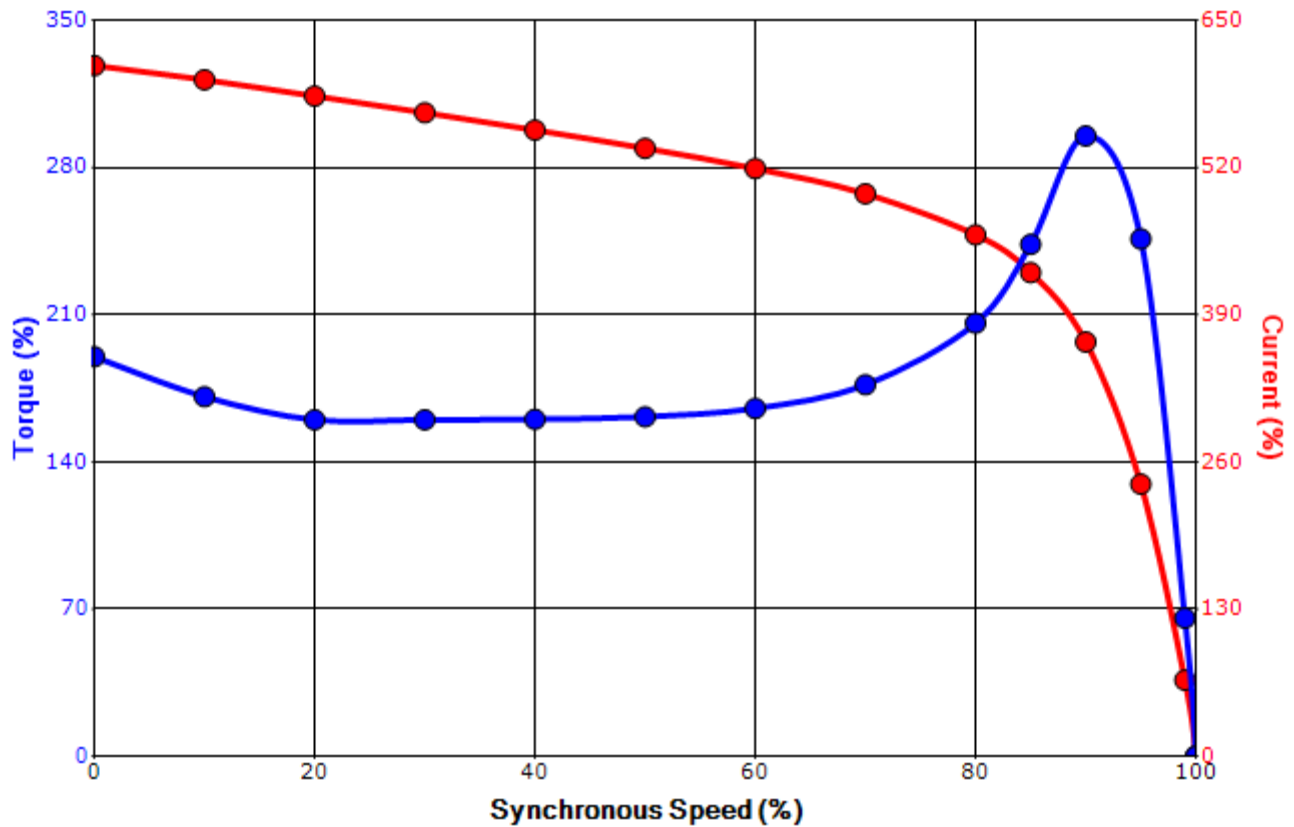
Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

SPEED TORQUE/CURRENT CURVE

Model: 0254SDSR41A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
25	18.5	4	1770	284T	230/460	60	3	62/31
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.15	CONT	93.6	B	G	40 C
Locked Rotor Amps	Rotor wk ² Inertia (lb-ft ²)	Torque				Pull Up (%)	Break Down (%)	
		Full Load (lb-ft)	Locked Rotor (%)					
182	5.23	74.2	190		165	295		

Design Values



Customer		wk ² Load Inertia (lb-ft ²)	-
Customer PO		Load Type	-
Sales Order		Voltage (%)	100
Project #		Accel. Time	-

Tag:

All characteristics are average expected values.

TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	jhock	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1121/1
Engr. Date	3/13/2014	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019



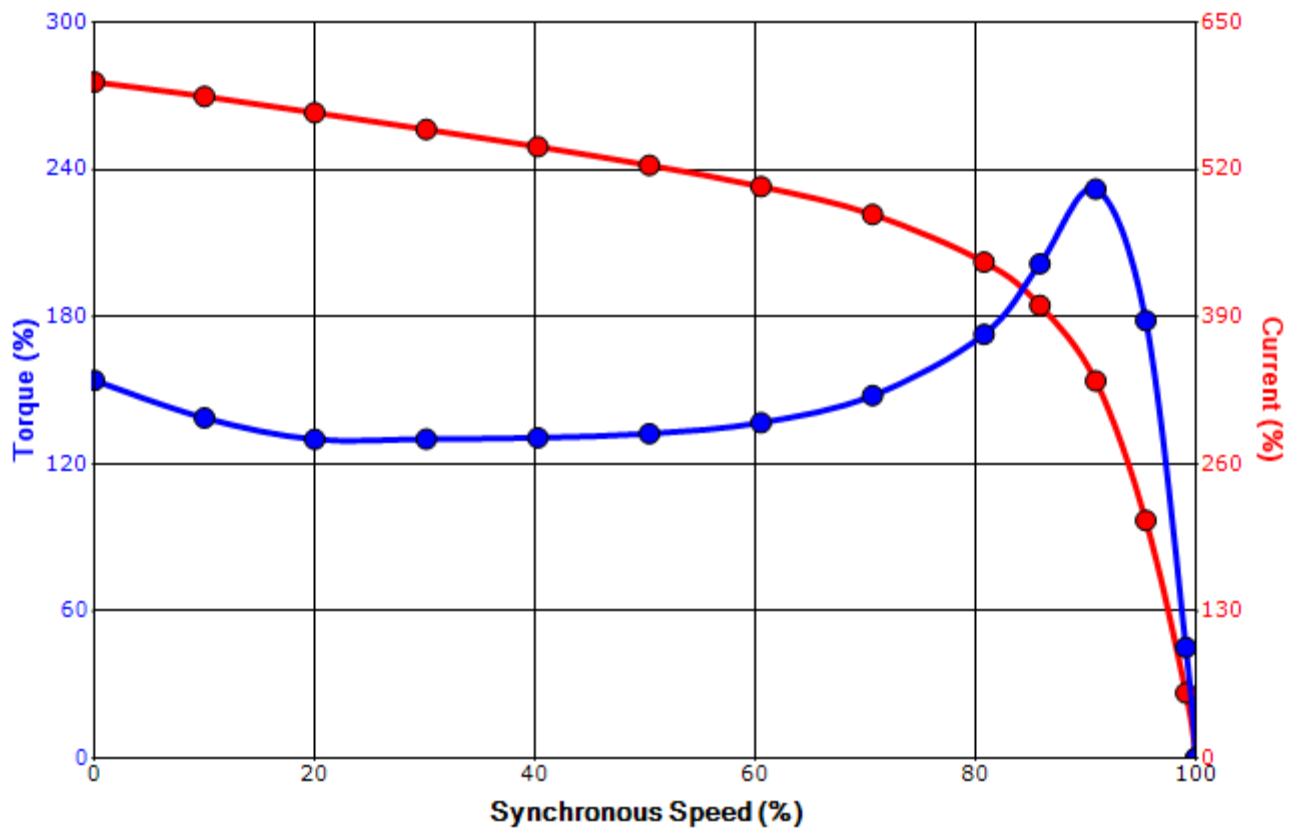
Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

SPEED TORQUE/CURRENT CURVE

Model: 0254SDSR41A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
25	18.5	4	1460	284T	190/380	50	3	72/36
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.0	CONT	91.7	B	G	40 C
Locked Rotor Amps	Rotor wk ² Inertia (lb-ft ²)	Torque						
		Full Load (lb-ft)	Locked Rotor (%)	Pull Up (%)	Break Down (%)			
215	5.23	89.9	150	135	230			

Design Values



Customer		wk ² Load Inertia (lb-ft ²)	-
Customer PO		Load Type	-
Sales Order		Voltage (%)	100
Project #		Accel. Time	-

Tag:

All characteristics are average expected values.

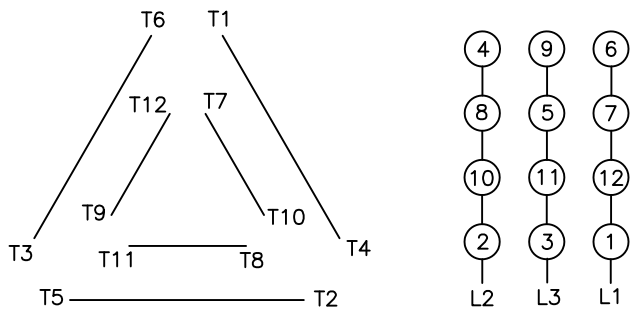
TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	jhock	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1121/1
Engr. Date	3/25/2014	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019

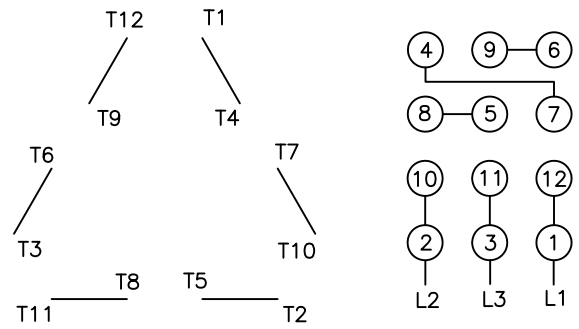
Motor Connection Diagrams
12 Leads

Across-the-Line Starting / Running Connections

Low Voltage Delta



High Voltage Delta



Switch L1 and L2 to reverse rotation

Suitable for Wye-Delta Starting and Limited Part-Winding-Starting.
Please Contact Toshiba International for specific connections.



SELECTION & SPECIFICATION DATA

Generic Type	Cross-linked epoxy polymeric amine
Description	An all-purpose immersion-grade epoxy that has a variety of attributes including low-temperature cure, surface tolerance, fast recoat times, moisture tolerance during application and cure, and excellent corrosion protection. It has low VOC and low HAP's content for use in areas with restricted volatile emissions. Can be used direct to metal as a corrosion resistant primer or as an intermediate coating over other primers. Suitable for both maintenance and new construction projects due to its excellent surface wetting characteristics and quick cure for handling. May also be used for immersion in potable water, fresh or salt water (marine) exposures.
Features	<ul style="list-style-type: none"> • Low temperature cure (20°F) • Excellent corrosion protection • Excellent application characteristics • Fast recoat times • Moisture tolerance during application • Extended recoat window for atmospheric exposures (6 months for most topcoats) • Low VOC and low HAPs content • Certified by UL to meet the drinking water criteria of NSF/ANSI/CAN 600
Color	Black (0900), (Grey (C705), Red (0500). Other limited colors available on request. <u>For Potable water use:</u> Blue (0100), Beige (0200), Grey (0700), White (0800), Red (0500).
Gloss	Satin
Primer	Self-Priming
Dry Film Thickness	4 - 6 mils (102 - 152 microns) per coat DFT in excess of 8.0 mils per coat is not recommended.
Solids Content	By Volume 65% +/- 2%
Theoretical Coverage Rate	1043 ft ² /gal at 1.0 mils (25.6 m ² /l at 25 microns) 261 ft ² /gal at 4.0 mils (6.4 m ² /l at 100 microns) 174 ft ² /gal at 6.0 mils (4.3 m ² /l at 150 microns) Allow for loss in mixing and application.
VOC Value(s)	Per EPA Method 24: 2.05 lbs/gal (246 g/l) Thinner 236 E (12 oz/gal): 2.05 lbs/gal (246 g/l) Thinner 242 E (12 oz/gal): 2.05 lbs/gal (246 g/l) Thinner 76 (12 oz/gal): 2.50 lbs/gal (300 g/l) These are nominal values and may vary slightly with color. Product contains VOC-exempt t-butyl acetate. Check local regulations regarding product usage.
Dry Temp. Resistance	Continuous: 180°F (82°C) Non-Continuous: 220°F (104°C)
Approvals	Potable Water Use Limitations @ 75°F (24°C): Max DFT: 16 mils # Coats: 2 Rating: >40,000 gal (tank) , > 4" (valves) Final cure to water immersion: 7 days @ 75°F (24°C)



SELECTION & SPECIFICATION DATA

Limitations	Epoxies lose gloss, discolor and eventually chalk in sunlight exposure. Do not apply over latex coatings. For immersion projects use only factory made material in special colors. Consult Technical Service for specifics.
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SUBSTRATES & SURFACE PREPARATION

General	Remove any oil or grease from surface to be coated with clean rags soaked in Carboline Thinner #2 or toluol.
Steel	<u>Atmospheric Exposure:</u> For optimal performance: Hand Tool or Power Tool clean in accordance with SSPC-SP 2, SSPC-SP 3, or SSPC-SP11 to produce a rust-scale free surface. For maximum performance: SSPC-SP 6 (or greater) with a 1½-3 mil (40-75 micron) blast profile. <u>Immersion Service:</u> Minimum near white metal cleanliness in accordance with SSPC-SP10.
Galvanized Steel	Galvanizing requires a roughened surface for optimum adhesion/performance of high build epoxies. Remove any contaminants per SSPC-SP1; ensure there are no chemical treatments that may interfere with adhesion; and abrade the surface to establish a suitable roughness (typically 1 mil). SSPC-SP16 or SSPC-SP7 are acceptable methods.
Concrete or CMU	Remove all loose, unsound concrete. Remove all oils or other non-compatible sealers or treatments. Do not apply coating unless the concrete has cured at least 28 days @ 70 F (21 C) and 50% relative humidity or equivalent. Consult Carboline Technical Service for more specific recommendations.
Stainless Steel	Surface profile should be a dense angular 1-3 mils and is best achieved through abrasive blasting in accordance with SSPC-SP16. Remove all contaminants that would interfere with the performance of stainless steel for the intended service such as, but not limited to, embedded iron or chlorides.

MIXING & THINNING

Mixing	Mix components separately, then combine and mix until homogenous.
Thinning	For atmospheric applications thin up to 10% by volume with Carboline Thinner 242E, 236E, or 76. Use up to 10% with Thinner 33 for brush and roller. If thinning is desired for potable water applications, Thinner 76 must be used.
Ratio	4:1 (Part A: Part B)
Pot Life	3 hours at 75°F (24°C) and less at higher temperatures. Pot life ends when coating becomes too viscous to use.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Spray Application (General)	This is a high solids coating and may require adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers. Hold gun 12-14 inches from the surface and at a right angle to the surface.
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APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Conventional Spray	Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, 0.070" I.D. fluid tip and appropriate air cap.
Airless Spray	Pump Ratio: 30:1 (min.) Volume Output: 2.5 gal/min (9.5 l/min) Material Hose: 3/8" I.D. min (905 mm) Tip Size: 0.017-0.021" (0.43-0.53 mm) Fluid Pressure: 2000-2500 psi (13.8-17.2 MPa) *PTFE packings are recommended and available from pump manufacturer.
Brush & Roller (General)	For applications over damp surfaces, brush and roller is the preferred method. Multiple coats may be required to obtain desired appearance, recommended dry film thickness, and adequate hiding. Avoid excessive re-brushing or re-rolling. For best results, tie-in within 10 minutes at 75°F (24°C). Use a short-nap synthetic roller cover with phenolic core.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	45°F (7°C)	20°F (-7°C)	20°F (-7°C)	0%
Maximum	90°F (32°C)	120°F (49°C)	100°F (38°C)	95%

Industry standards are for substrate temperatures to be above the dew point. Carboguard 635 is unique in that it can tolerate damp substrates. See Brush or Roller above. Special thinning and application techniques may be required above or below normal conditions.

CURING SCHEDULE

Surface Temp.	Dry to Handle	Dry to Topcoat Minimum	Dry to Topcoat Maximum	Dry to Touch
20°F (-7°C)	36 Hours	24 Hours	180 Days	4 Hours
35°F (2°C)	18 Hours	2 Hours	180 Days	2 Hours
50°F (10°C)	11 Hours	1 Hour	180 Days	1 Hour
75°F (24°C)	3 Hours	45 Minutes	180 Days	30 Minutes
90°F (32°C)	1.5 Hours	30 Minutes	180 Days	15 Minutes

These times are to be used as a guideline for non-immersion applications. The longer the first coat has to cure, particularly in sunlight exposure or elevated temps, the higher risk of inadequate adhesion. If those maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. Contact your local Carboline Representative for assistance/guidance.

The listed times in the chart above are based on a 4-6 mil (100-150 micron) dry film thickness per coat. Deviation from those thicknesses may compromise the performance and adhesive properties of the film. Higher film thickness, insufficient ventilation or cooler temperatures could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing will not affect performance but may cause discoloration and result in a surface haze. Any haze or blush must be removed by water washing before recoating. For force curing, contact Carboline Technical Service for specific requirements.

*Do not apply to substrates with ice or ice crystal formation. Dehumidify or raise the temperature to eliminate ice on the substrate. This product will tolerate drops in temperature to 0°F (-17°C) during its cure and will continue to cure when the temperature rises. Follow "Cure for Service" guideline listed above to determine when the product is fully cured.

Cure for Potable Water Use: 7 day cure after final coat @ 75°F.

Carboguard[®] 635 VOC

PRODUCT DATA SHEET



CURING SCHEDULE

Surface Temp.	Dry to Topcoat Minimum	Dry to Topcoat with Antifoulant Maximum	Dry to Topcoat with Itself
20°F (-7°C)	24 Hours	36 Hours	30 Days
35°F (2°C)	2 Hours	16 Hours	30 Days
50°F (10°C)	1 Hour	8 Hours	30 Days
75°F (24°C)	45 Minutes	4 Hours	30 Days
90°F (32°C)	30 Minutes	3 Hours	30 Days

The curing schedule above references curing times for immersion service when an antifoulant topcoat is used.

The optimum time to topcoat with an antifoulant is when the film is "touch-tacky." If the touch-tacky time has been exceeded, or if the film is "glossy," you can generally re-prime/refresh the first coat with a fresh coat of itself. High temps and/or sunlight exposure may shorten this recoat schedule.

Marine Use: Undocking time of 24 hours @75°F

CLEANUP & SAFETY

Cleanup	Use Thinner 2 or MEK. In case of spillage, absorb and dispose of in accordance with local applicable regulations.
Safety	Read and follow all caution statements on this product data sheet and on the SDS for this product. Wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.
Ventilation	When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.
Caution	This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workers should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

PACKAGING, HANDLING & STORAGE

Shelf Life	Part A: 24 months at 76°F (24°C) Part B: 24 months at 76°F (24°C) *Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.
Storage Temperature & Humidity	40 -100°F (4°C-38°C) 0-95% Relative Humidity
Storage	Store Indoors. KEEP DRY
Shipping Weight (Approximate)	1 Gal Kit - 14 lbs (6.4 kg) 5 Gal Kit - 65 lbs (29.5 kg)
Flash Point (Setaflash)	Part A: 66°F (19°C) Part B: 80 °F (27°C) Mixed: 77°F (25°C)



WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.



SELECTION & SPECIFICATION DATA

Generic Type	High solids polyamine-epoxy
Description	Ultra high solids epoxy that is designed as a liner for potable water, demineralized water, wastewater and many other services. It is widely used as a tank lining for steel and concrete tanks. Product is self-priming and is normally applied in two coats. Formulated for application at conventional builds (4 to 6 mils per coat) as well as high builds (10 mils per coat).
Features	<ul style="list-style-type: none"> • NSF/ANSI 61 compliant for use in potable water tanks, pipes, and valves.* • Meets the FDA requirements for 21CFR 175.300 for direct food contact • Meets the requirements of AWWA C210 • Ultra High solids; Low VOC and HAPs • Handles deionized water up to 150°F (66°C) • Ultra low VOC (67 g/l) • Good chemical resistance • Excellent thermal shock resistance • Good abrasion resistance <p>*Contact Carboline Technical Service for approved dimensions. Valid when manufactured at a certified location.</p>
Color	Light Grey (0700), White (0800), other limited colors available. All colors are unmatched
Finish	Semi-Gloss
Primer	Self-priming
Dry Film Thickness	4 - 10 mils (102 - 254 microns) per coat (5-13 wet mils thinned 10%) Can be applied 2 or 3 coats. Do not exceed 20 mils total DFT.
Solids Content	By Volume 86% +/- 2%
Theoretical Coverage Rate	1371 ft ² /gal at 1.0 mils (33.7 m ² /l at 25 microns) 343 ft ² /gal at 4.0 mils (8.4 m ² /l at 100 microns) 137 ft ² /gal at 10.0 mils (3.4 m ² /l at 250 microns) Allow for loss in mixing and application.
VOC Value(s)	As Supplied: 0.52 lbs./gal (62 g/l) Per EPA Method 24: 0.56 lbs./gal (67 g/l) Per EPA Method 24: 13 oz./gal. of Thinner 2: 1.18 lbs./gal (142 g/l) Per EPA Method 24: 13 oz./gal of Thinner 225 E: 0.56 lbs./gal (67 g/l) Per EPA Method 24: 13 oz./gal of Thinner 76: 1.14 lbs./gal (137g/l) These are nominal values and may vary slightly with color. Product contains VOC-exempt t-butyl acetate. Check local regulations regarding product usage.
Dry Temp. Resistance	Continuous: 250°F (121°C) Non-Continuous: 275°F (135°C) Some discoloration and loss of gloss is observed above 200°F (93°C).
Limitations	Epoxies may lose gloss, discolor and chalk when exposed to sunlight.

Carboguard[®] 891 VOC

PRODUCT DATA SHEET



SELECTION & SPECIFICATION DATA

Wet Temp. Resistance | Handles deionized water immersion temperatures up to 150°F (66°C)
Water immersion temperatures up to 180°F (82°C)

SUBSTRATES & SURFACE PREPARATION

General | Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel | **Immersion:** SSPC-SP10/NACE 2
Non-immersion:: SSPC-SP6/NACE 3
Surface Profile: 2-3½ mils (50-88 microns)

Concrete or CMU | Immersion: Concrete must be cured 28 days at 75°F (24°C) Prepare surfaces in accordance with SSPC-SP13/NACE 6 or ICRI 03732 to obtain CSP 3 to 5 roughness. Attain a surface profile resembling extra coarse sandpaper. Eliminate leaks and infiltrations and remove standing water. Resurface areas with excessive cavities (bugholes) or exposed aggregate using a high-strength resurfacing product like Carboguard 510. Carboguard 510 may be used to patch bugholes and to resurface.

MIXING & THINNING

Mixing | Power mix separately, then combine and power mix. **DO NOT MIX PARTIAL KITS.** Requires short 15 min sweat-in time.

Thinning | Thinning will be required to properly atomize the mixed material. For potable water end uses thin up to 10% (13 oz/gal) with Thinner #2 or Thinner #225E (VOC exempt thinner). For all other uses Thinner #76 may be used in addition to Thinners #2 and 225E.

Ratio | 2:1 Ratio (A to B)

Pot Life | 1¼ Hours at 75°F (24°C)
2 Hours at 60°F (15.5°C)
Pot life ends when coating loses body and begins to sag. Pot life times will be less at higher temperatures.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Conventional Spray | Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, 0.070" I.D. fluid tip and appropriate air cap. Adjust air pressure to approximately 50 psi at the gun and provide 10-20 lbs. of pot pressure.

Airless Spray | Pump Ratio: 30:1 (min.)
GPM Output: 2.5 (min.)
Material Hose: 3/8" I.D. (min.)
Tip Size: 0.017"-0.021"
Output PSI: 1500-2300
Filter Size: 60 mesh
PTFE packings are recommended and available from the pump manufacturer.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Brush & Roller (General)	Recommended for small areas and repairs only. Use a high quality brush, and apply a very light crisscross brush coat. Allow to dry for approximately 5 minutes. Then apply a heavy coat using a crisscross brush pattern. Normally, a film thickness of 2.5-3 mils (62- 75 microns) can be obtained per coat by this method.
Brush	Use a medium bristle brush.
Roller	Not recommended.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	50°F (10°C)	50°F (10°C)	50°F (10°C)	0%
Maximum	90°F (32°C)	125°F (52°C)	110°F (43°C)	90%

This product simply requires the substrate temperature to be above the dew point. Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions.

Note: Prior to spray application, stripe brush all weld attachments and surface irregularities using Carboguard 891 VOC thinned 10% by volume with Thinner #225E.

CURING SCHEDULE

Surface Temp.	Dry to Recoat	Final Cure Immersion	Maximum Recoat Time
50°F (10°C)	36 Hours	14 Days	90 Days
60°F (16°C)	20 Hours	10 Days	60 Days
75°F (24°C)	10 Hours	7 Days	45 Days
90°F (32°C)	5 Hours	5 Days	21 Days

These times are based on a 4.0-6.0 mil (102-152 microns) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing can interfere with the cure, can cause discoloration and may result in a surface haze. Any haze or blush must be removed by water washing before recoating. If the maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. Food-grade exposures require force curing at 225°F for four hours. Raise temperature 30°F for every 30 minutes until temperature is reached. (Other curing temperatures in table below). METAL TEMPERATURE - CURING TIME 150°F/66°C - 12 Hrs 175°F/79°C - 10 Hrs 200°F/93°C - 6 Hrs 225°F/107°C - 4 Hrs

CLEANUP & SAFETY

Cleanup	Use Thinner #225E. In case of spillage, absorb and dispose of in accordance with local applicable regulations.
Safety	Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions.

Carboguard[®] 891 VOC

PRODUCT DATA SHEET



CLEANUP & SAFETY

Ventilation	When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator
Caution	This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

TESTING / CERTIFICATION / LISTING

Potable Water Certifications	Potable Water Use Limitations @ 75°F (24°C): Max DFT: 20 mils (508 microns) # Coats: 2 to 3 Tank Rating: >50 gal (189.271 Liters) Pipe Rating: 15" or larger (38.1 cm) Valve Rating: 1.5" or larger (3.81 cm) Thinning: Thinner 2 or 225 E at 10% by volume 14 Day Cure Required before service Or: Max DFT: 20 mils (508 microns) # of Coats: 2 to 3 Tank Rating: >70,000 gal (264978.82 Liters) Pipe Rating: Not Rated Valve Rating: Not Rated Thinning: Thinner 2 or 225E at 10% by volume 7 Day Cure Required before service Approved Colors: 0700 (Light Grey), 0800 (White) Special Order Colors: 0100 (Light blue), 0900 (Black), 6120 (Blue), 0794 (Grey), 0200 (Tan)
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PACKAGING, HANDLING & STORAGE

Shelf Life	Part A: Min. 12 months at 75°F (24°C) Part B: Min. 6 months at 75°F (24°C) *Shelf Life: When kept at recommended storage conditions and in original unopened containers.
Storage Temperature & Humidity	40° - 110°F (4° - 43°C) 0-100% Relative Humidity
Storage	Store Indoors.
Shipping Weight (Approximate)	1 Gallon Kit - 15 lbs (6.8 kg) 5 Gallon Kit - 75 lbs (34 kg)
Flash Point (Setaflash)	Part A: 24°F (-4.5°C) Part B: 41°F (5°C)



WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.

TAB B

TAB B

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SALES ORDER DESCRIPTION

SALES SHEET NUMBER: 0005

P.O. 0000110

QTY	PART NUMBER	DESCRIPTION
2	6X4 CF4	6X4 MODEL CF4 CHOP-FLOW

RPM: 1750
CONDITIONS: 80 GPM @ 651 FT TDH

Standard Pump Configuration
Steel @ Hardare

Seal Type: Single Mechanical Seal
Seal Manufacturer: Slurry Dynamics
Atmospheric Drive End Side Seal Face
Materials: Tungsten Carbide Silicon
Carbide
Slurry Dynamics Single Mechanical Seal

Trillium Supplied Motor
10 HP, L215TC 1800 rpm Premium Efficient Motor
TEFC Horizontal C-Face
Direct Drive
C-Face Foot Mounted Motor
4 Pole, 60 Hz
Premium Efficient Severe Duty
TEFC
460 V
Steel baseplate
Direct Drive Baseplate
Trillium Standard Baseplate Design
Steel Baseplate Hardare

Coupling - WSP Standard

Serial Number: 000521 @ 000522



Trillium Flow Technologies
440 West 800 South
Salt Lake City, UT 84101-2229

T 801 359 8731
F 801 355 9303
www.trilliumflow.com

SPARE PARTS PROVIDED

<u>Part Number</u>	<u>Description</u>	<u>Qty/Per</u>	<u>UM</u>
809293	SEAL,MECH SLURRY DYN 1.75	1.	EA

**Part Number 20003
BAR CUTTER 6X4 CF2**

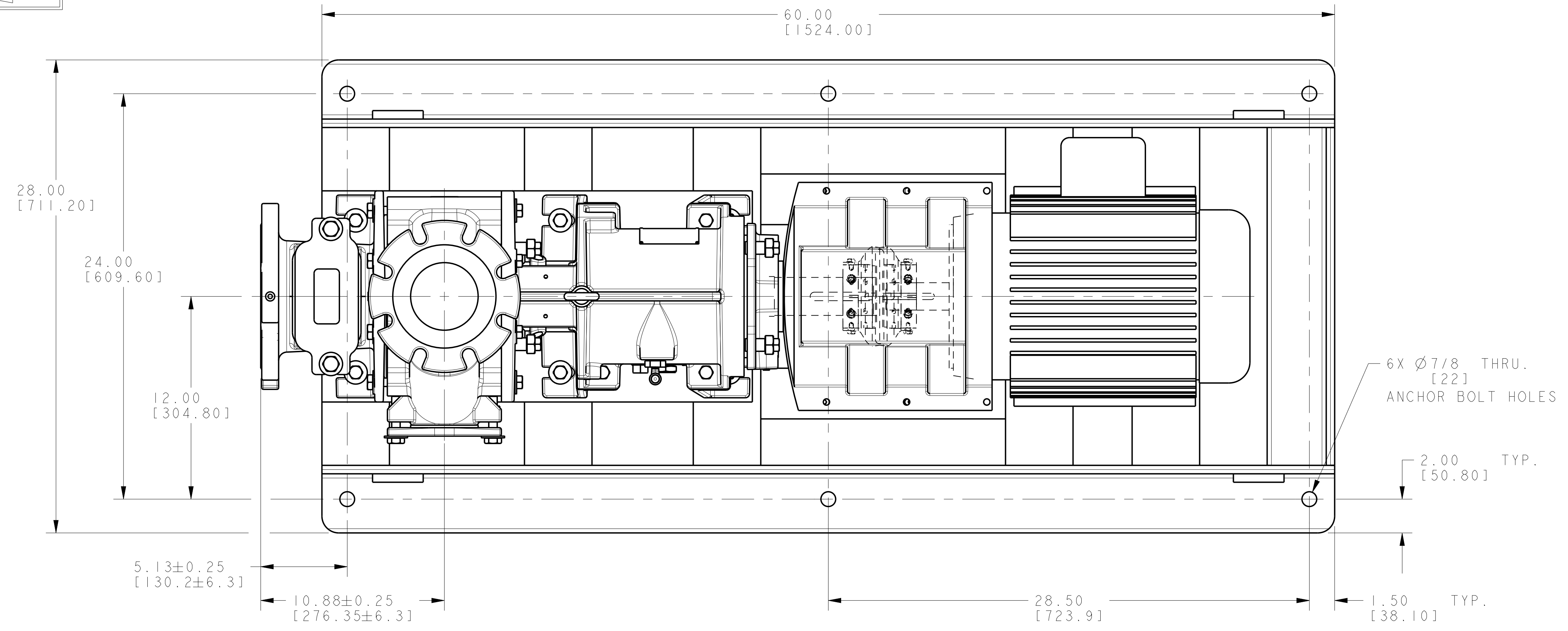
<u>Part Number</u>	<u>Description</u>	<u>Qty/Per</u>	<u>UM</u>
701158-1	CUTTER BAR, 6X4 CF2/CF4	1.	EA

**Part Number 20001
TOOL IMP INSTALL 6X4 CF2**

<u>Part Number</u>	<u>Description</u>	<u>Qty/Per</u>	<u>UM</u>
702108-01	IMPELLER INSTAL TOOL,6X4 CF2	1.	EA



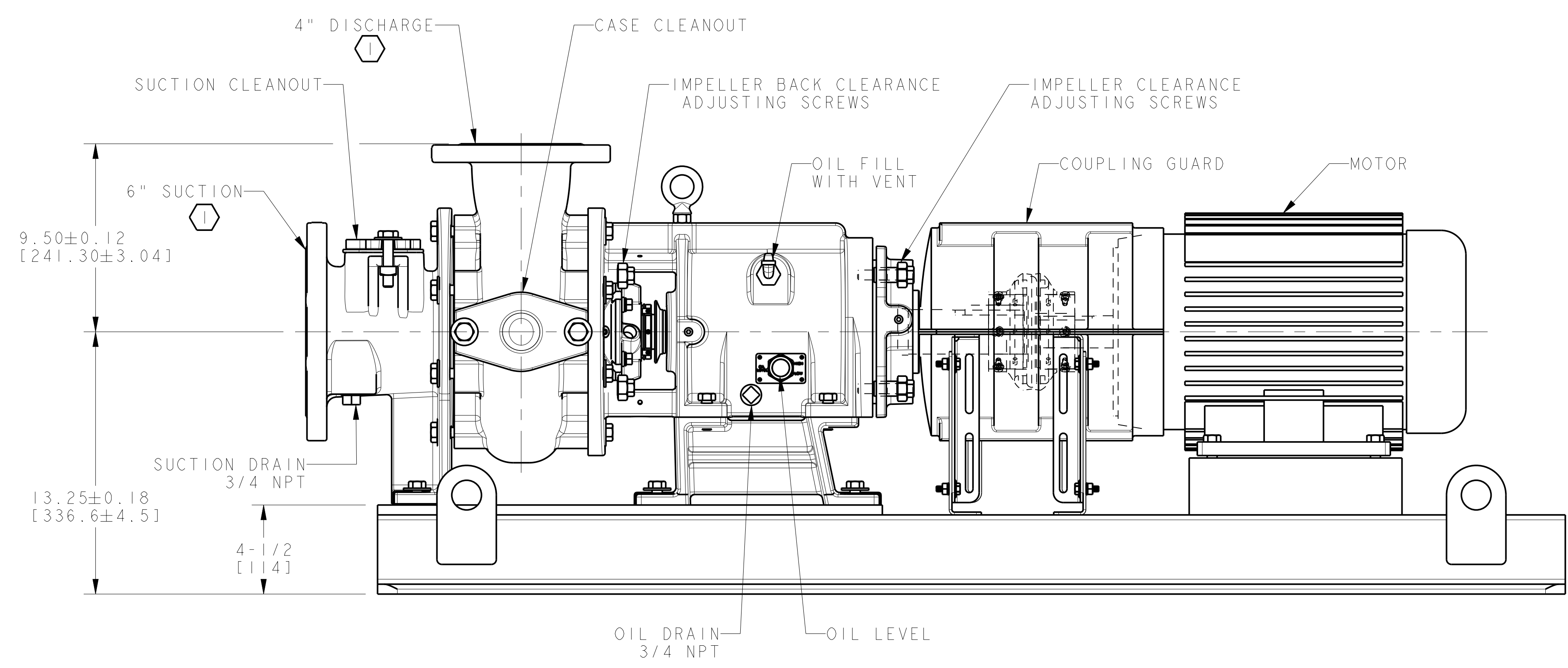
THIRD ANGLE PROJECTION



6X Ø7/8 THRU. [22] ANCHOR BOLT HOLES

2.00 TYP. [50.80]

1.50 TYP. [38.10]



NOTES:

- 1. SUCTION AND DISCHARGE FLANGES MATE WITH STD. 150 LB ANSI FLANGES
- 2. DIMENSIONS ARE NOT FOR INSTALLATION PURPOSES UNLESS CERTIFIED
- 3. IMPERIAL DIMENSIONS ARE DRIVING. SECONDARY DIMENSIONS [MM] ARE FOR REFERENCE.

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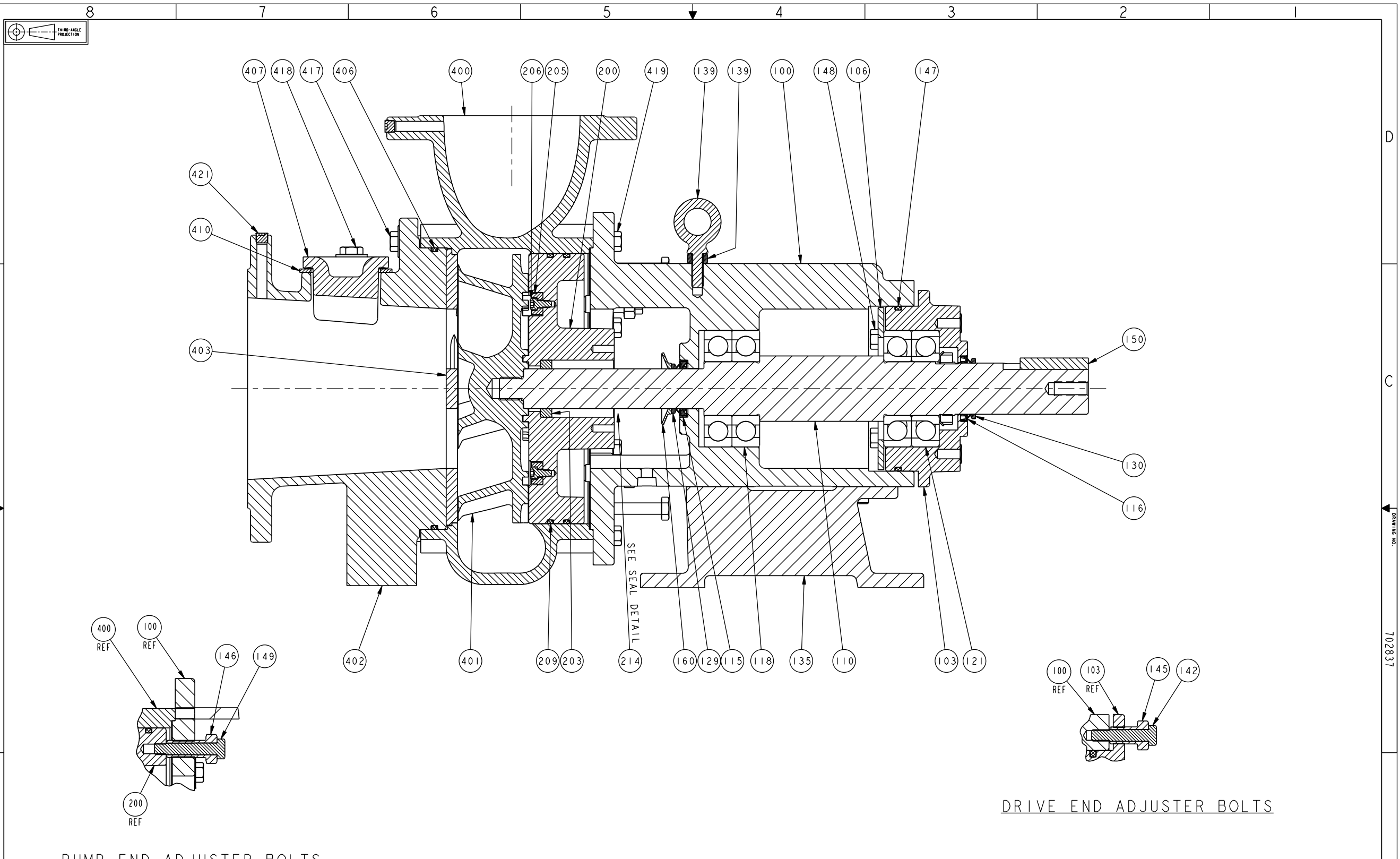
NO.	BY	DATE	CHK'D	ECN	DESCRIPTION	CERTIFIED FOR CONSTRUCTION	DWG. NO.	DESCRIPTION

CUSTOMER	W M LYLES CO	
USER	CHINO RP-4 PRIMARY CLARIFIER	
SERIAL NO.	20DW12670-02, -03	
CUSTOMER ORDER NUMBER	EPS SALES SHEET NO.	
55-1187-04	DW12670	
DRAWN BY	DATE	
DAYA	03-13-20	
CHECKED	DATE	
SHIVA	03-13-20	
APPROVED	DATE	
DEVIN H	03-13-20	

TRILLIUM FLOW TECHNOLOGIES™		WEMCO® ROTO-JET®	
GENERAL ASSEMBLY, DIRECT CONNECT 6X4 CF2/CF4, 254TC MOTOR CHOPPER PUMPS WEMCO PUMPS			
CAD NO. 709366-1	SCALE 1/4	SIZE D	SHEET 1 OF 1
			REVISION 0

DRAWING NO.

709366



PUMP END ADJUSTER BOLTS

DRIVE END ADJUSTER BOLTS

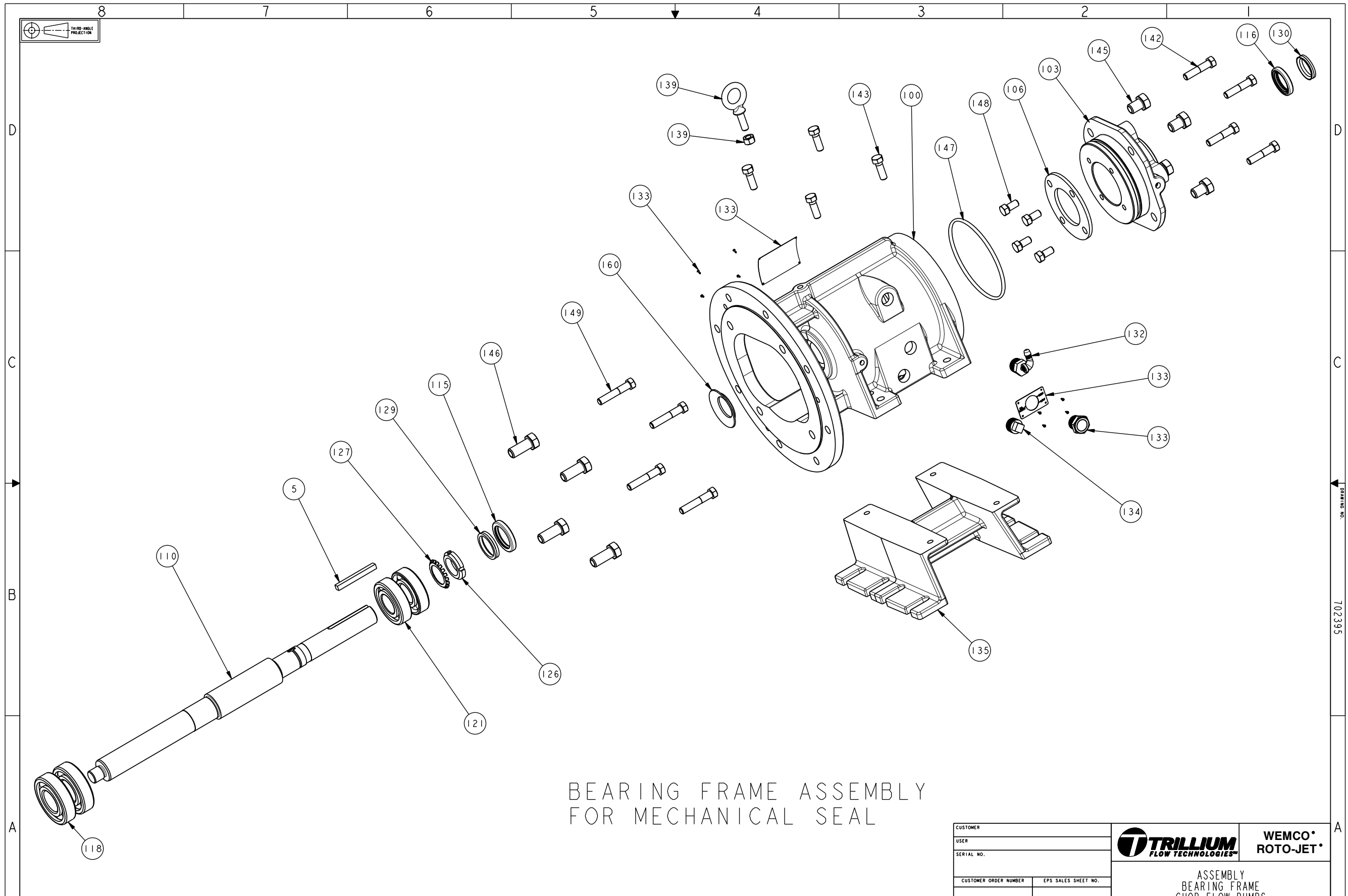
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NO.	BY	DATE	CHK'D	LCL ECH	INT'L ECH	DESCRIPTION
X	X	X	X	X	X	

CERTIFIED FOR CONSTRUCTION
 DATE _____
 BY _____

REFERENCE	DWG. NO.	DESCRIPTION
CODE NO. 480/AQU 590	CHG 10/04/19	

CUSTOMER		TRILLIUM FLOW TECHNOLOGIES	WEMCO® ROTO-JET®
USER			
SERIAL NO.		BARE PUMP ASSY 6X3 THRU 10X8 HORIZ. CHOPPER PUMPS WEMCO CHOP-FLOW PUMPS	
CUSTOMER ORDER NUMBER	EPS SALES SHEET NO.		
DRAWN BY	JCH	DATE	12/08/06
CHECKED	e.n.g	DATE	12/08/06
APPROVED	e.n.g	DATE	12/08/06
CAD NO. 702837-1		SCALE	1/2
SHEET 1 OF 1		SIZE	D
DRAWING NO. 702837		REVISION	1



BEARING FRAME ASSEMBLY
FOR MECHANICAL SEAL

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REFERENCE	DWG. NO.	DESCRIPTION

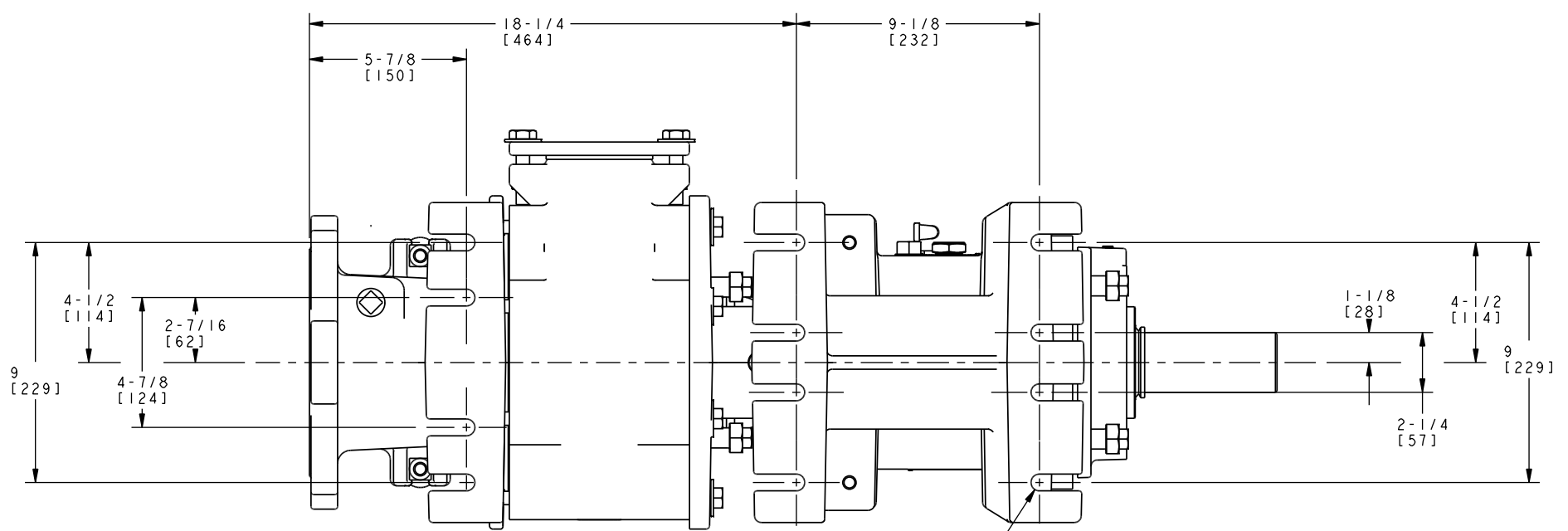
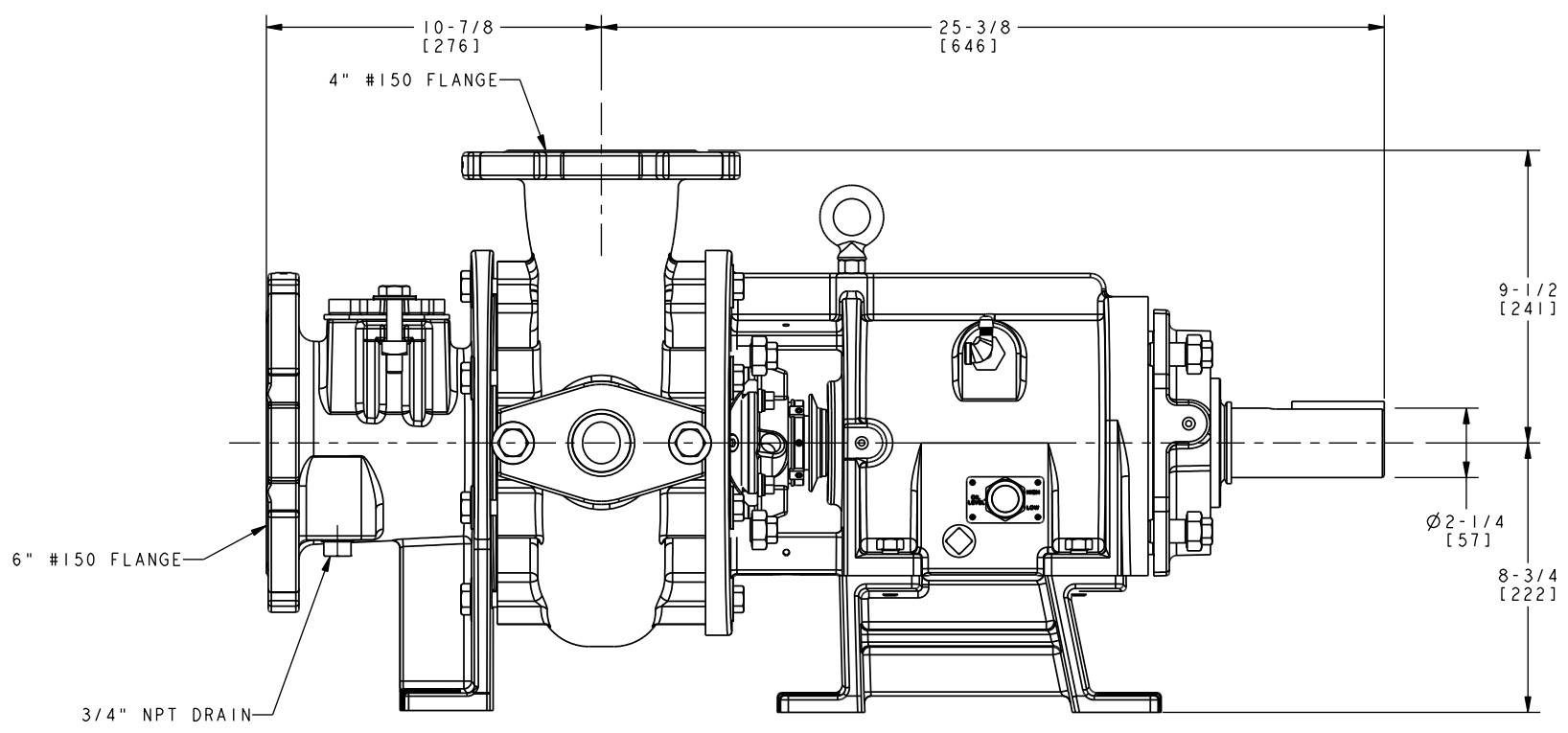
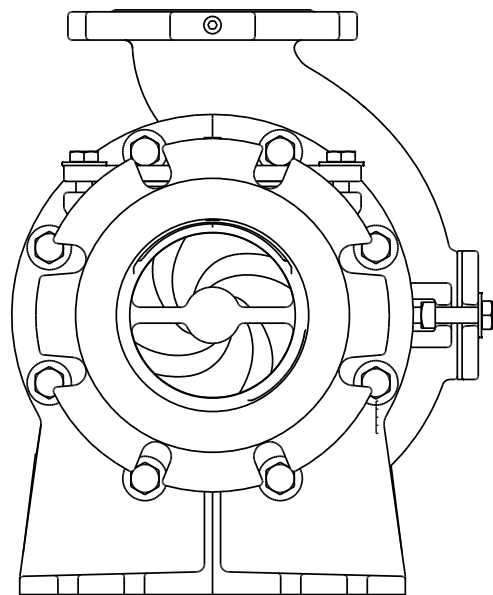
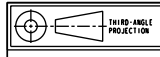
CUSTOMER	
USER	
SERIAL NO.	
CUSTOMER ORDER NUMBER	EPS SALES SHEET NO.
DRAWN BY	DATE
VJP	01-27-06
CHECKED	DATE
e.ng	01-27-06
APPROVED	DATE
e.ng	01-27-06



WEMCO®
ROTO-JET®

ASSEMBLY BEARING FRAME CHOP-FLOW PUMPS	
CAD NO. 702395-1	SHEET 1 OF 1
SCALE 1/1	SIZE D
702395	REVISION 0

DRAWING NO. 702395



6X Ø1/2 BOLTS (TYP)

NOTES:

- 1. IMPERIAL DIMENSIONS ARE DRIVING DIMENSIONS. SECONDARY [MM] ARE FOR REFERENCE.

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NO.	BY	DATE	CHK'D	LCL ECH	INT'L ECH	DESCRIPTION
1	ENG	6/19	DAH			ADDED DUAL DIMENSIONING

CUSTOMER	
USER	
SERIAL NO.	
CUSTOMER ORDER NUMBER	EPS SALES SHEET NO.
DRAWN BY	JCH
DATE	3/08/06
CHECKED	eng
DATE	3/08/06
APPROVED	eng
DATE	3/08/06

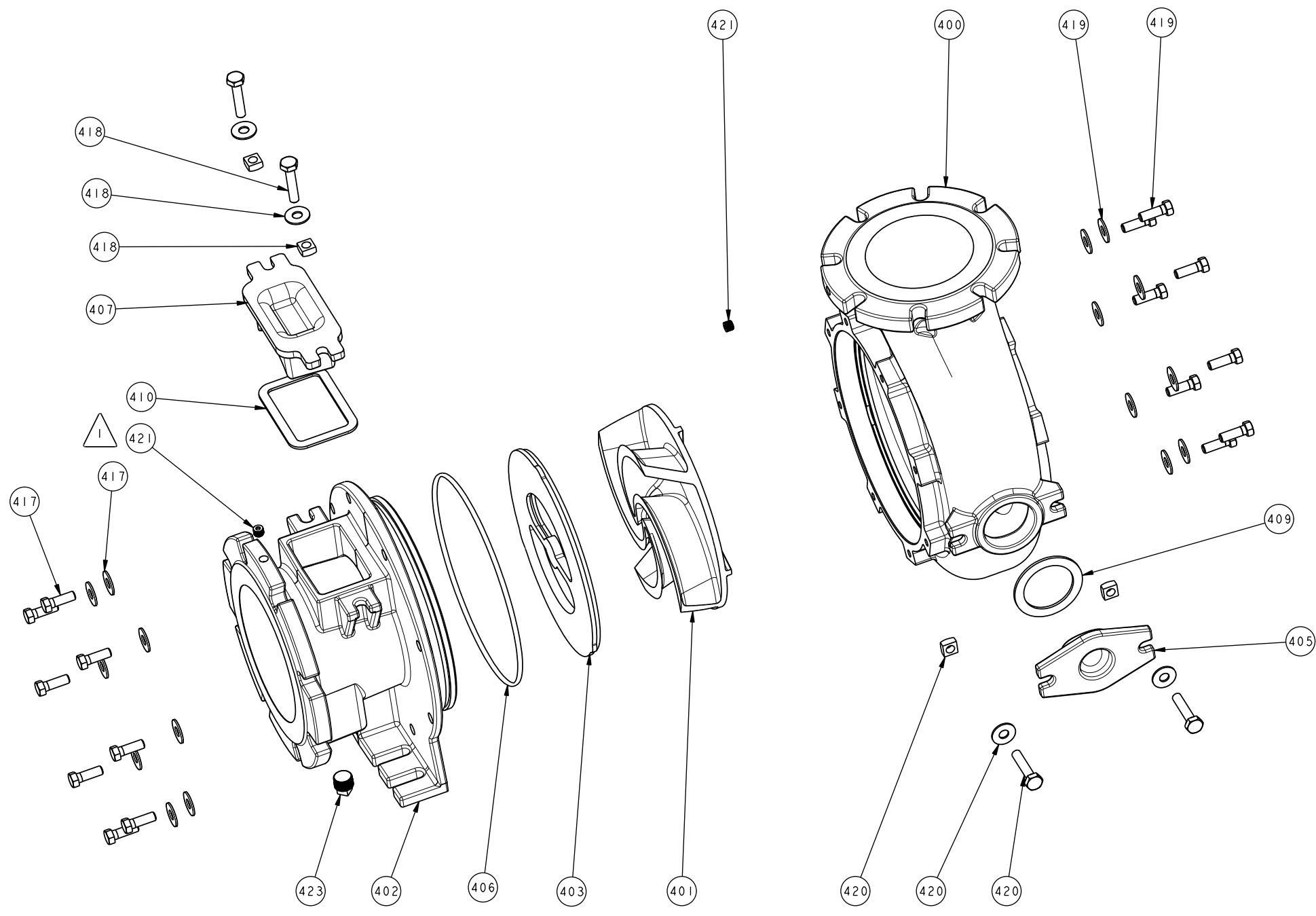
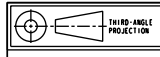


WEMCO®
ROTO-JET®

OUTLINE DIMENSIONS
6 X 4 CF2/4 BELT DRIVE
CHOPPER PUMP
CHOP-FLOW PUMPS

CAD NO.	702426-1	SHEET 1 OF 1
SCALE	3/8	SIZE
DWG NO.	D	702426
REVISION		1

DRAWING NO. 702426



WET END ASSEMBLY

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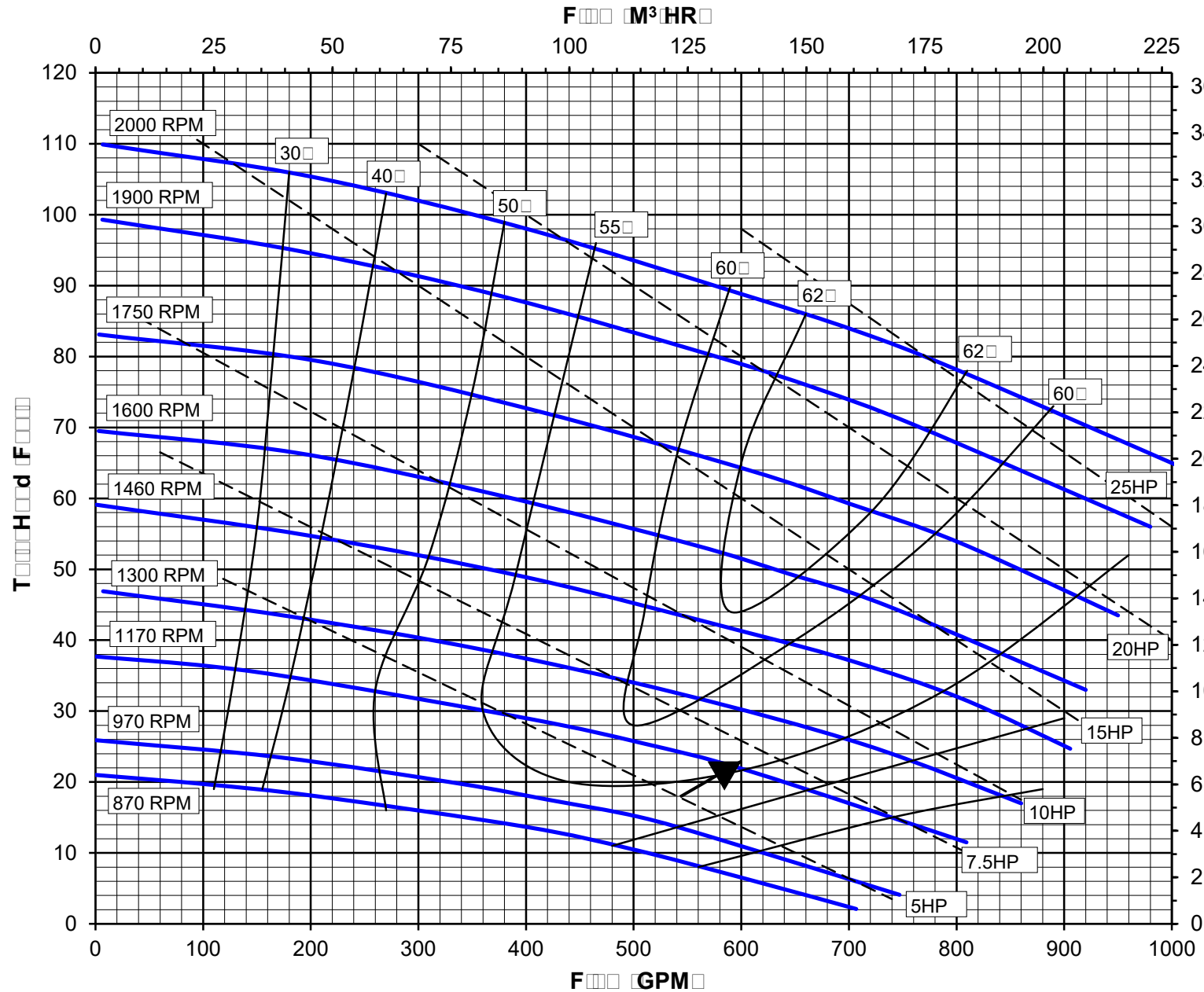
NO.	BY	DATE	CHG'D	LCL ECH	INT'L ECH	DESCRIPTION	CERTIFIED FOR CONSTRUCTION
1							

CUSTOMER				WEMCO® ROTO-JET®	
USER				ASSEMBLY WET END CHOPPER PUMPS WEMCO PUMPS	
SERIAL NO.		CUSTOMER ORDER NUMBER		EPS SALES SHEET NO.	
DRAWN BY		DATE		CAD NO. 702393-1	
CHECKED		DATE		SCALE 5/16	
APPROVED		DATE		SIZE DWG NO. D	
CODE NO. 480/AQU 590 CHG 10/07/19				SHEET 1 OF 1 702393	
				REVISION 1	

DRAWING NO. 702393

WSP™ CHOP-FLOW

CF
C F P



S
D
l
l

$$BHP = \frac{GPM \times FT \times SG}{3960 \times Efficiency}$$

$$kW = \frac{M^3/hr \times M \times SG}{367 \times Efficiency}$$

The brake horsepower and efficiency shown is for
properly installed and lubricated piping.
Pumps with mechanical seals will require additional
horsepower and the manufacturer should be contacted for
these values.
Certified tests are performed using Hydraulic Institute
approved grade 2B.

Copyright 2019

C P

N 2:1

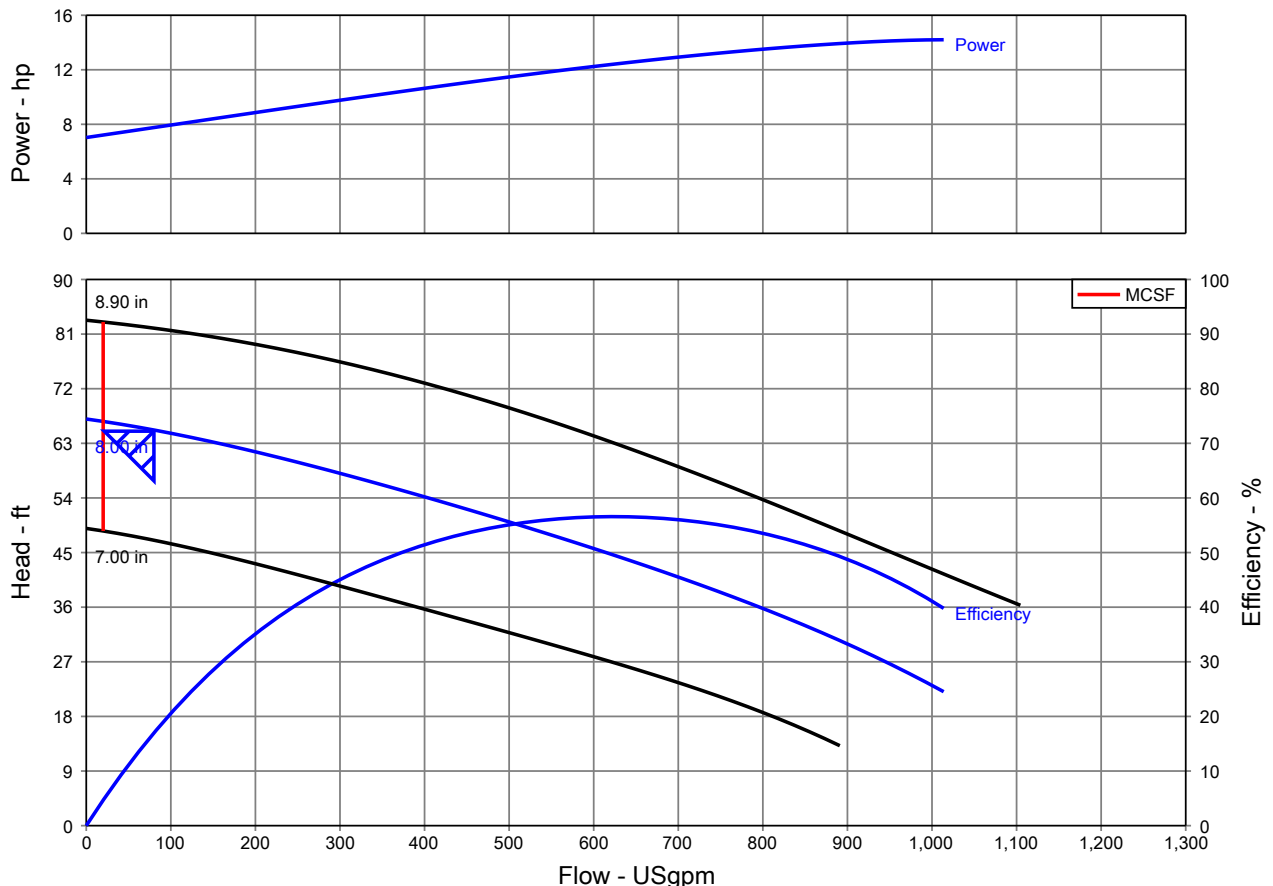
RPM

" CF

Pump Performance Datasheet

Customer	: Wescor Associates Inc.	Quote number	: 1441511
Customer reference	:	Size	: 6x4 CF4
Item number	: 002	Stages	: 1
Service	: Section 11315 Horizontal Chopper Pumps	Based on curve number	: CF1006
Quantity	: 2	Date last saved	: 26 Jul 2021 10:49 AM

Operating Conditions		Liquid	
Flow, rated	: 80.0 USgpm	Liquid type	: User defined
Differential head / pressure, rated (requested)	: 65.0 ft	Additional liquid description	:
Differential head / pressure, rated (actual)	: 65.6 ft	Solids diameter, max	: 0.00 in
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Solids concentration, by volume	: 0.00 %
NPSH available, rated	: Ample	Temperature, max	: 68.00 deg F
Site Supply Frequency	: 60 Hz	Fluid density, rated / max	: 1.000 / 1.000 SG
		Viscosity, rated	: 1.00 cP
		Vapor pressure, rated	: 0.00 psi.a
Performance		Material	
Speed criteria	: Synchronous	Material selected	: Standard
Speed, rated	: 1750 rpm		
Impeller diameter, rated	: 8.00 in	Pressure Data	
Impeller diameter, maximum	: 8.90 in	Maximum working pressure	: 29.01 psi.g
Impeller diameter, minimum	: 7.00 in	Maximum allowable working pressure	: 100.0 psi.g
Efficiency	: 16.97 %	Maximum allowable suction pressure	: N/A
NPSH required / margin required	: - / 0.00 ft	Hydrostatic test pressure	: N/A
Ns (imp. eye flow) / Nss (imp. eye flow)	: 2,045 / - US Units	Driver & Power Data (@Max density)	
MCSF	: 20.0 USgpm	Driver sizing specification	: Rated power
Head, maximum, rated diameter	: 67.0 ft	Margin over specification	: 0.08 %
Head rise to shutoff	: 2.78 %	Service factor	: 1.00
Flow, best eff. point	: 623 USgpm	Power, hydraulic	: 1.32 hp
Flow ratio, rated / BEP	: 12.83 %	Power, rated	: 7.76 hp
Diameter ratio (rated / max)	: 89.89 %	Power, maximum, rated diameter	: 14.20 hp
Head ratio (rated dia / max dia)	: 79.53 %	Minimum recommended motor rating	: 10.00 hp / 7.46 kW
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00		
Selection status	: Acceptable		





Trillium Flow Technologies
440 West 800 South
Salt Lake City, UT 84101-2229

T 801 359 8731
F 801 355 9303
www.trilliumflow.com

RECORD A COUPLING STRUCTURE SELECTION

Printed on 02/11/11

ASE DC STL 213215TC HD A

PART NUMBER	DESCRIPTION	QTY PER	UM
806844	CPLG,VIVA V150 2.250x1.375	1.	EA



Rex Viva™

***Elastomeric
Couplings***

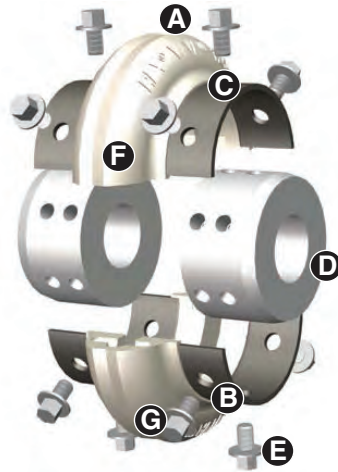
***Acoplamiento
Elastomérico***

***Accouplement à
Élastomère***

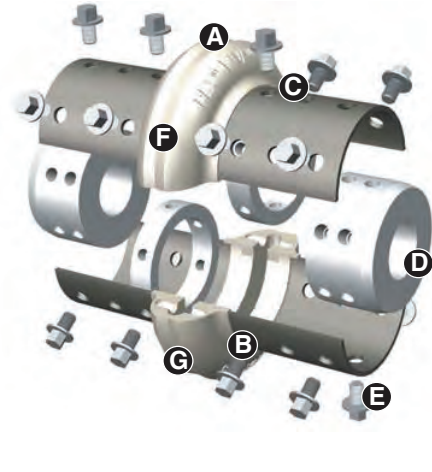
Description

Descripción

Description



Rex Viva Close-Coupled Couplings
Acoplamiento estándar Rex Viva
Accouplement Rex Viva Standard



Rex Viva Spacer Couplings
Acoplamiento Rex Viva versión larga
Accouplement Rex Viva Version longue

A - Two-piece flex element design allows for simple replacement without disturbing hubs or moving and realigning connected equipment.

B - Tough polyurethane material is bonded to a corrosion resistant coated shoe, eliminating the need for mechanical clamping hardware.

C - Adhesive coated high strength carbon steel shoe resists corrosion.

D - Easily aligned reversible hubs accommodate multiple shaft gaps. Hubs are available in rough bore, custom bore, or bushed designs. Optional hub materials are available.

E - High grade capscrews are provided with self locking nylon thread patches. Stainless steel capscrews are also available.

F - Torsionally soft polyurethane element cushions shock loads, accommodates unavoidable misalignment and is compatible with most environments.

G - "V" notch design directs stress concentration away from the bond area providing a uniform failure area for overload protection if required.

A - El diseño de los elementos flexibles en dos mitades permite un recambio sencillo sin afectar a los núcleos, ni desplazar, ni realinear el equipo conectado.

B - El elemento de poliuretano está vulcanizado a una pieza en forma de teja, resistente a la corrosión, lo cual elimina la necesidad de mecanismo de fijación.

C - Teja de acero al carbono de gran resistencia con revestimiento resiste la corrosión.

D - Los núcleos de acero son reversibles, de fácil alineación, y admiten múltiples distancias entre los árboles. Hay disponibles núcleos ciegos, con agujero acabado, o según diseño requerido. Hay disponibles otras opciones de material para los núcleos.

E - Los tornillos hexagonales, de alta calidad, van equipados con sistema de autobloqueo Nyloc. También hay disponibles tornillos hexagonales de acero inoxidable.

F - El elemento de poliuretano, flexible a la torsión, absorbe las cargas de choque, compensa la falta de alineación y es compatible con la mayor parte de los entornos.

G - El diseño de ranura en "V" aleja la concentración del esfuerzo, en el área de vulcanizado, proporcionando un área de fallo uniforme para protección contra sobrecarga en caso necesario.

A - La conception des éléments flexibles en deux pièces permet le remplacement simple sans déplacer les moyeux et/ou réalignement des équipements connectés.

B - L'élément en polyuréthane est lié chimiquement à une coquille résistant à la corrosion, éliminant l'utilisation de liaison mécanique.

C - Les coquilles ont une protection adhésive assurant une bonne tenue à la corrosion.

D - Facilement alignables, les moyeux réversibles permettent de multiples combinaisons d'espaces entre les arbres. Les moyeux sont disponibles non-alésés, alésés ou pour douille universelle. Plusieurs matériaux sont disponibles.

E - Les vis de haute qualité sont auto-freinées par Nyloc. Des vis en acier inoxydable sont également disponibles.

F - Souple en torsion, l'élément en polyuréthane amorti les chocs, s'accommode des inévitables défauts d'alignements et est compatible avec la majorité des environnements.

G - La forme en "V" éloigne les concentrations de contraintes de la surface de liaison en créant une ligne de déchirement en cas de surcharges.

Description

Rex Viva is based on the design of its reputable predecessor, Rex Omega. Design upgrades allow Rex Viva to transmit greater torque with a smaller coupling that, in addition, can accept larger bores. Although they have similar configurations, their parts are not interchangeable.

Rex Viva is a non-lubricated, torsionally flexible coupling with no wearing parts. Its angular, axial and radial flexibility comes from its polyurethane membrane. It consists of only four components; two axially-split half flexible elements with capscrews and two hubs. All versions are field adjustable to meet ISO, DIN and ANSI shaft spacing specifications of up to 300 mm without the need of additional parts.

The Flexible Element

The unique two-piece, split-in-half flexible element allows replacement without disturbing the hubs or connected equipment. A half element consists of a polyurethane membrane chemically bonded to two formed steel shoes. It transmits torque in shear through the membrane. Patented stress relief notches found on the end of each membrane uniformly distribute shear stresses. The polyurethane is formulated to withstand cyclic fatigue, common environmental conditions, and industrial chemicals. Although not to be used as a torque limiting device, the membrane serves as a fuse disconnecting the equipment in case of lockup or severe overload conditions. The steel shoes are coated, not painted, for optimal resistance against oxidation and industrial chemicals. Paired half elements are supplied factory weight matched to ensure standard balance conform with ISO G16 and AGMA Class 8.

Upgrades

The 'V' notch on the polyurethane membrane channels stresses to provide a uniform center-line tear for overload protection.

Longer shoes for the smaller sizes reduce the need to oversize selections to meet required distance between shaft ends.

Increased material cross-sections derived from Finite Element Analysis minimize stresses during operation to the connected equipment.

The new VSX version connects shafts with extra wide gaps (up to 300 mm) maintaining the basic four component design; two axially-split half flex elements and two hubs. No special hubs or sleeves are required.

Descripción

El Rex Viva se basa en el diseño de su reputado predecesor, el Rex Omega. Las mejoras de diseño permiten al Rex Viva transmitir un mayor par de torsión con una talla más pequeña de acoplamiento, aceptando, además, diámetros de árboles más grandes. A pesar de que tienen configuraciones similares, sus piezas no son intercambiables.

El Rex Viva es un acoplamiento flexible a la torsión, sin mantenimiento, y sin piezas desgastables. Su flexibilidad angular, axial y radial, proviene del elemento de poliuretano. Está formado por sólo cuatro elementos: dos mitades flexibles unidas sentido axial, con tornillos hexagonales, y dos núcleos. Todas las versiones pueden ajustarse para cumplir las especificaciones ISO, DIN y ANSI referentes al espaciado de los árboles, hasta 300mm, sin necesidad de piezas adicionales.

El Elemento Flexible

El exclusivo elemento flexible en dos mitades, permite el recambio sin afectar a los núcleos ni al equipo conectado. Una mitad consta de una semi cubierta de poliuretano, no reforzada, vulcanizada a dos tejas de acero perforadas. La transmisión del par motor se realiza por cizallamiento a través de la cubierta. Las ranuras, patentadas, para disipación del esfuerzo, realizadas en cada semi-cubierta, distribuyen de modo uniforme los esfuerzos de cizallamiento. El poliuretano se ha diseñado para soportar la fatiga cíclica, las circunstancias ambientales habituales y los productos químicos industriales. Aunque no debe utilizarse como dispositivo limitador del par de torsión, la cubierta, actúa a modo de fusible desconectando el equipo en caso de que se produzcan un bloqueo o una sobrecarga, graves. Las tejas de acero están revestidas, no pintadas, para ofrecer una resistencia óptima contra la oxidación y los productos químicos industriales. Las dos mitades se suministran emparejadas desde fábrica, con el peso igualado para garantizar el equilibrio en cumplimiento de las normas ISO G16 y AGMA Clase 8.

Mejoras

La ranura en 'V' en la cubierta de poliuretano canaliza los esfuerzos, con el fin de proporcionar una línea central de ruptura uniforme, para protección contra sobrecargas.

La mayor longitud de las tejas, paralas tallas más pequeñas, reduce la necesidad de aumentar las dimensiones de las selecciones, para cumplir las condiciones de distancia, necesaria entre los extremos de los árboles.

El aumento de las secciones transversales del material, derivado del análisis por elementos finitos, minimiza los esfuerzos que se transmiten al equipo conectado durante su funcionamiento.

La nueva versión VSX conecta árboles con espacios intermedios de gran tamaño, hasta 300 mm., manteniendo

Description

La conception du Rex Viva est basée sur celle de son prédécesseur, Rex Omega. Les améliorations de conception permettent au Rex Viva de transmettre un couple plus élevé dans un encombrement plus petit, ceci en autorisant de plus grands alésages. Bien qu'ils soient de conception similaire, leur pièces ne sont pas interchangeables.

Rex Viva est un accouplement flexible en torsion, non lubrifié sans pièce d'usure. Ses flexibilités angulaire, axiale et radiale proviennent de sa membrane en polyuréthane. Il est composé de seulement quatre composants : deux demi éléments flexibles séparés axialement, des vis de fixation et deux moyeux. Toutes les versions sont réglables pour se conformer aux normes ISO, DIN et ANSI, des spécifications d'espacement des bouts d'arbres jusqu'à 300 mm sans utiliser de pièce supplémentaire.

L'élément Flexible

La conception originale en deux pièces symétriques de l'élément flexible permet son remplacement sans déplacement des machines connectées. Un demi élément consiste en une membrane de polyuréthane non renforcée liée chimiquement à deux coquilles en acier, préformées et perforées. L'élément flexible transmet le couple par cisaillement à travers la membrane. Les formes en fossette brevetées de chaque bout de section de membrane répartissent uniformément les contraintes de cisaillement. Le polyuréthane a été spécialement étudié pour résister à la fatigue cyclique, conditions d'environnement normales, et aux ambiances chimiques industrielles. Sans être utilisée comme un organe de limitation de couple, la membrane peut servir d'élément fusible déconnectant les équipements en cas de blocage ou de sérieuses conditions de surcharges. Les coquilles en acier sont protégées et non peintes, pour obtenir une résistance optimale contre l'oxydation et les produits chimiques industriels. Les demi éléments sont appariés en fonction de leur poids en usine pour assurer un équilibrage conforme aux normes ISO G16 et AGMA Classe 8.

Améliorations

La forme en 'V' de la membrane en polyuréthane canalise les contraintes pour obtenir une ligne uniforme de déchirement pour la protection contre les surcharges.

Les petites tailles disposent de coquilles plus longues réduisant ainsi la nécessité de surdimensionner la sélection pour obtenir la distance entre bouts d'arbres souhaitée.

La section de matière accrue dérivée d'une Analyse par Elements Finis minimise les contraintes sur les machines connectées pendant le fonctionnement.

La nouvelle version VSX connecte des arbres très espacés (jusqu'à 300 mm) tout en conservant les quatre composants de base : deux demi éléments flexibles

Description

Capscrews

Metric capscrews with self-locking Nyloc thread patches are in standard steel (stainless steel optional). They conform to precise engineering specifications and are supplied standard with flexible elements. They fasten radially for easy accessibility. Blind mounting of capscrews, therefore, is avoided. The capscrews generate a clamping force between the hub's outer diameter and the inner shoe surface.

Upgrades

Larger and more numerous fasteners enhance the robust base design.

Hubs

In standard steel, hubs are also available in stainless steel or with special surface treatment for particular corrosion resistance. They can be used interchangeably with V, VS and VSX (see below) versions for any given size.

Upgrades

A cylindrical hub, without a step for the smaller sizes, accepts larger bores. Two rows of radial holes grant more field spacing adjustability.

High Speed Rings

Machined from cold rolled steel, the rings are optional as reinforcement for the VS version.

Upgrades

Not required for any size of the VS version.

Descripción

el diseño básico de cuatro componentes: dos mitades flexibles unidas siguiendo el eje axial y dos núcleos. No son necesarios núcleos ni manguitos especiales.

Tornillos hexagonales

Los tornillos hexagonales métricos con sistema de autobloqueo Nyloc se suministran en acero estándar (acero inoxidable opcional). Cumplen especificaciones precisas y se suministran conjuntamente con los elementos flexibles. Su montaje radial facilita el acceso a los mismos y evita de ese modo el montaje a ciegas de los tornillos, generándose una fuerza de sujeción entre el diámetro exterior del núcleo y la superficie interior de las tejas.

Mejoras

Mayor número y tamaño de los tornillos, para mejorar, el ya de por sí, robusto diseño básico.

Núcleos

En acero fundido convencional, se encuentran también disponibles en acero inoxidable o con tratamientos especiales de superficie para conseguir una resistencia específica a la corrosión. Pueden utilizarse de modo intercambiable con las versiones V, VS y VSX de cualquier talla dada (ver más adelante).

Mejoras

Un núcleo cilíndrico, sin valonas para las tallas más pequeñas y que acepta diámetros interiores mayores. Dos hileras de orificios radiales proporcionan mayor posibilidad de ajuste in situ.

Anillos de alta velocidad

Fabricados de acero laminado en frío. Los anillos son opcionales como refuerzo para la versión VS.

Mejoras

No se necesitan para ningún tamaño de la versión VS.

Description

séparés axialement et deux moyeux. Il ne nécessite aucun manchon ni moyeux spécial.

Vis de Fixation

Les vis de fixation métriques en acier (acier inoxydable en option) sont étudiées pour être également utilisées avec des clefs en pouce. Elles se conforment à de précises spécifications techniques et sont livrées automatiquement avec les éléments flexibles. Leur montage radial offre une bonne accessibilité et évite ainsi leur montage en aveugle. Les vis de fixation créent une adhérence entre le diamètre extérieur des moyeux et la surface intérieure de la coquille. Elles sont autofreinées par Nyloc.

Améliorations

Un plus grand nombre de vis de dimension supérieure renforce la conception de base déjà robuste.

Moyeux

En fonte et en acier en standard, les moyeux sont également disponibles en acier inoxydable ou avec un traitement de surface spécial pour obtenir une résistance particulière à la corrosion. Ils peuvent être utilisés indifféremment sur les versions V, VS ou VSX (voir ci-dessous) pour quelques tailles données.

Améliorations

Un moyeu cylindrique sans épaulement pour les plus petites tailles accepte de plus grands alésages. Deux rangées de trous radiaux autorisent une plus grande possibilité de d'ajustement de distance entre bouts d'arbres.

Anneaux de Survitesse

Usinés dans de l'acier roulé à froid, les anneaux pour renforcer l'accouplement sont facultatifs pour les versions VS.

Améliorations

Ne sont plus exigés pour la version VS.

Coding

Codificación

Codification

V	²	³ 150	⁴	-	⁵	-	⁶ HCB	⁷	⁸ 2.250(.500)/1.375
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<p>2 Version No code: standard S: spacer SX: extended spacer</p>	<p>Versión Sin código: estándar S: separador SX: separador extralargo</p>	<p>Version Aucun : standard S : longue SX : Extra longue</p>
<p>3 Size 110, 125, 130, 150, 170, 190, 215, 245, 290, 365, 425, 460</p>	<p>Tamaño 110, 125, 130, 150, 170, 190, 215, 245, 290, 365, 425, 460</p>	<p>Taille 110, 125, 130, 150, 170, 190, 215, 245, 290, 365, 425, 460</p>
<p>4 Shoe and capscrew material No code: standard</p>	<p>Material de tejas y tornillos Sin código: estándar</p>	<p>Matière des coquilles et vis Aucun : standard</p>
<p>5 High speed ring (Only S and SX version) No code: without ring R: with high speed rings; Standard on SX version.</p>	<p>Anillo de alta velocidad (Sólo versiones S y SX) Sin código: sin anillo R: con anillos de alta velocidad; estándar en la versión SX.</p>	<p>Anneau de haute vitesse (Versions S et SX seulement) Aucun : sans anneau R : avec anneaux ; Standard sur la version SX.</p>
<p>6 Hub type HRB: pilot bored HCB: custom bored HTL: bored for <i>Magic-Lock</i>® bushings</p>	<p>Tipo de núcleo HRB: ciego HCB: con agujero acabado especí- fico HTL: para casquillo <i>Magic-Lock</i>®</p>	<p>Type de moyeux HRB : préalésés HCB : alésages spécifiques HTL : pour douille <i>Magic-Lock</i>®</p>
<p>7 Hub material No code: standard STL: steel SS: stainless steel X: other</p>	<p>Material del núcleo Sin código: estándar STL: acero SS: acero inoxidable X: otro</p>	<p>Matière des moyeux Aucun : standard STL : acier SS : acier inoxydable X : autre</p>
<p>8 Bores and keyways specifications Without specification, keyways as per ISO R773.</p>	<p>Especificaciones de diámetros interiores y chaveteros Sin especificación, chaveteros según ISO R773.</p>	<p>Spécification d'alésage et de clavetage Sans spécification, clavetage selon ISO R773.</p>

Example

Ejemplo

Exemple

V	S	125		-	R	-	HCB	ø28 mm H7 / ø30 mm H7
---	---	-----	--	---	---	---	-----	-----------------------

Rex Viva complete coupling, spacer version, size 125, capscrews, high speed ring, custom bored standard hubs to ø28mm H7 tolerance and ø30mm H7 tolerance with standard keyways as per ISO R773.

Acoplamiento completo Rex Viva, con separador, tamaño 125, tejas y tornillos de acero inoxidable, anillo de alta velocidad, núcleos con agujeros de ø28mm H7 de tolerancia y ø30mm H7 de tolerancia con chaveteros estándar según ISO R773.

Accouplement Rex Viva version longue, taille 125, à coquilles et vis en acier inoxydable, anneaux de haute vitesse, moyeux standard alésés ø28mm tolérance H7 et ø30mm tolérance H7 avec clavetages normalisés suivant ISO R773.

Magic-Lock® is a registered trademark of taper bushings completely interchangeable with Taper-Lock® bushings.
Taper-Lock® is a registered trademark of Reliance Electric Company.

Magic-Lock® es una marca registrada de casquillos cónicos completamente intercambiables con casquillos Taper-Lock®.
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Magic-Lock® est une marque enregistrée de douilles complètement interchangeables avec les douilles Taper-Lock®.
Taper-Lock® est une marque enregistrée par la société Reliance Electric Company.

V			
	Standard version	Versión estándar	Version normale
100 ▶ 460	Size	Talla	Taille
-			
HRB (HCB)	Hub type	Tipo de núcleo	Type de moyeux
- / STL / SS / X	Hub material	Material del núcleo	Matière des moyeux

The user is responsible for the provision of safety guards and correct installation of all equipment.

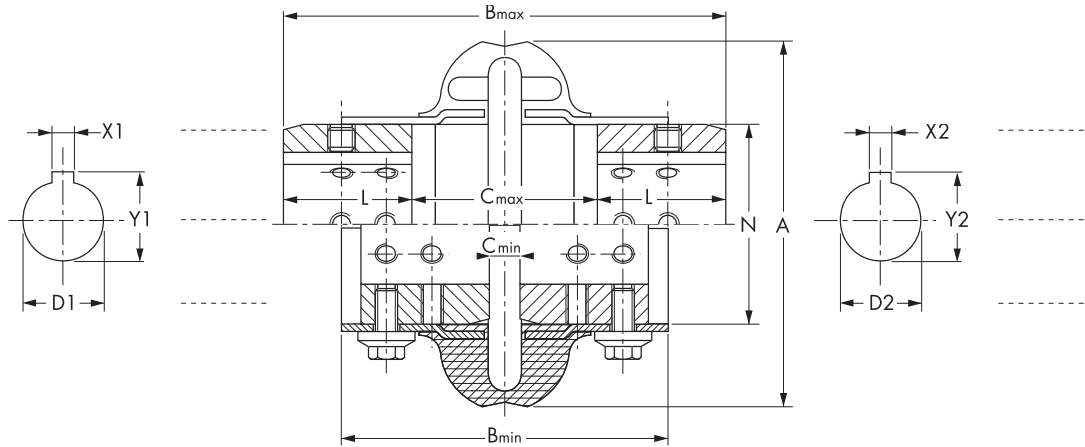
Certified dimensions available upon request.

El usuario es responsable de la provisión de dispositivos de seguridad y de la correcta instalación de todo el equipo.

Se proporcionarán las dimensiones certificadas si así se solicita.

Les dispositifs de protection doivent être prévus par l'utilisateur. Celui-ci est responsable de l'installation correcte de l'ensemble.

Dimensions définitives sur demande.



Remarks:

Unless specified on the order draft, couplings are delivered without boring.

(1) For speeds > n_{max} : consult factory.

(2) Maximum bores for keyways as per ISO R773.

(3) With maximum bore.

Notas:

A no ser que se 245 especificque en el 290 borrador de pedido, los acoplamientos se suministran sin agujeros acabados.

(1) Para velocidades > n_{máx}: consulte a la fábrica.

(2) Diámetros interiores máximos para chaveteros según ISO R773.

(3) Para diámetro interior máximo.

Remarques :

Sans indication à la commande, les accouplements sont livrés non alésés.

(1) Pour des vitesses > n_{max} : nous consulter.

(2) Alésages maximum pour rainures suivant ISO R773.

(3) Pour alésage maximum.

Size Tamaño Taille	T _N (Nm) 9550.kW	n _{max} min ⁻¹ (1)	D1 D2 min.	D1 D2 max. (2)	A	B min.	B max.	C min.	C max.	L	N	J kgm ² (3)	m kg (3)
110	62	5 400	10	38	110	97	132	9	55	38	60	0,00123	1,4
125	105	5 400	10	48	120	98	132	9	55	38	70	0,00202	1,7
150	164	5 400	11	55	130	97	132	7	55	44	80	0,00310	2,1
150	250	4 800	10	65	150	111	162	9	60	51	95	0,009	4,2
170	308	4 800	11	65	168	111	162	9	60	51	95	0,00931	4,3
190	412	4 600	19	75	190	116	164	7	60	52	117	0,0173	5,5
215	662	4 300	19	80	213	134	191	11	64	64	140	0,0303	9,6
245	938	4 100	19	95	245	137	202	7	73	65	171	0,076	14,4
290	1 412	3 900	27	110	290	153	241	8	94	73	215	0,192	24,9
365	3 200	3 600	35	127	365	200	311	20	131	90	235	0,373	42,0
425	5 580	2 000	35	155	425	247	361	19	133	114	286	1,180	85,0
460	6 270	2 000	48	165	460	267	380	19	132	124	302	1,720	93,0

Selection Procedure

1/ Choice of coupling type:

The choice is based on the type of application and the operating conditions.

The reference charts on page 13 and 14 can help with the choice of coupling type.

(Note: only use couplings with positive engagement for lifting motion!)

2/ Calculation of the nominal torque Ta (Nm) of the driven machine

$$T_a = \frac{9550 \times P_a}{n}$$

where: Pa = absorbed torque (kW) of the driven machine,
n = speed (min⁻¹)

3/ Service factor determination SF

See table in each catalogue. Service factor adders should be used if:

- the driven machine is an internal combustion engine where torque fluctuations of more than 20% may occur (see page 12),
- the operating speed approaches the critical speed (consult factory),
- the ambient temperature exceeds 60°C (consult factory).
- the number of starts per hour is more than 10 (consult factory).

4/ Calculation of the equivalent torque Teq (Nm)

$$T_{eq} = T_a \times (SF + S_t) *$$

where: Ta = torque (Nm) of the driven machine,
SF = service factor
St = Temperature service factor (see p.15)

5/ Select the coupling size so that:

$$T_N \geq T_{eq}$$

where: TN = nominal torque of the coupling (see dimensional drawings)

6/ Checking of the selection

The maximal peak torque:

$$T_{max} \leq 2 \times T_N$$

7/ Checking of the bores

Check when the shaft diameters are known, whether the corresponding bores are available.

If the coupling is to be bored and key-wayed, the correct dimensions and tolerances should be advised.

Procedimiento de selección

1/ Elección del tipo de acoplamiento:

La elección se basa en el tipo de aplicación y en las condiciones de operación.

Las tablas de referencia en las páginas 13 y 14 pueden facilitar la elección del tipo de acoplamiento.

(Nota: ¡utilice sólo acoplamientos con clavamiento seguro para un movimiento de elevación!)

2/ Cálculo del par de torsión nominal Ta (Nm) de la máquina impulsada

donde: Pa = par de torsión absorbido (kW) de la máquina impulsada,
n = velocidad (min⁻¹).

3/ Determinación del factor de servicio SF

Véase la tabla en cada catálogo.

Deberían utilizarse factores de servicio adicionales si:

- la máquina impulsora es un motor de combustión interna en el que pueden ocurrir variaciones del par de torsión superiores al 20 %, ver la página 9.
- la velocidad de funcionamiento se acerca a la velocidad crítica, consúltenos.
- la temperatura ambiente supera los 60 °C, consúltenos.
- el número de encendidos por hora es mayor de 10, consúltenos.

4/ Cálculo del par de torsión corregido Teq (Nm)

donde: Ta = par de torsión (Nm) de la máquina impulsada,
SF = factor de servicio
St = factor de servicio de la temperatura (véase la p. 15)

5/ Seleccione el tamaño del acoplamiento de modo que:

donde: TN = par de torsión nominal del acoplamiento (véanse los dibujos acotados)

6/ Comprobación de la selección

El par de torsión máximo:

7/ Comprobación de los diámetros internos

Cuando se conozcan los diámetros de los árboles, compruebe si están disponibles los diámetros internos correspondientes. Si el acoplamiento debe agujerarse y amortajar, deberían indicarse las dimensiones y tolerancias correctas.

Méthode de sélection

1/ Choix du type d'accouplement :

Celui-ci est déterminé par le genre d'application et par les conditions de fonctionnement.

Les tableaux synthétiques des pages 13 à 14 peuvent aider à ce choix.

(Remarque : employer uniquement un accouplement assurant une liaison positive sûre pour un mouvement de levage !)

2/ Calcul du couple nominal Ta(Nm) de la machine

où : Pa = puissance absorbée (kW) par la machine,
n = vitesse (min⁻¹).

3/ Choix du facteur de service SF

Voir tableau dans chaque catalogue.

Des facteurs de service complémentaires doivent être appliqués lorsque :

- la machine motrice est un moteur à combustion interne pouvant occasionner des variations de couple de plus de 20% (voir page 9),
- la vitesse de régime se rapproche sensiblement de la vitesse critique (nous consulter),
- la température ambiante dépasse 60°C (nous consulter).
- le nombre de démarrages par heure est supérieur à 10 (nous consulter).

4/ Calcul du couple équivalent Teq (Nm)

où : Ta = couple (Nm) de la machine entraînée,
SF = facteur de service
St = Facteur de service température (voir p.15)

5/ Sélection de la taille de l'accouplement, de manière que :

où : TN = couple nominal de l'accouplement (voir plans d'encombrements).

6/ Vérification de la sélection

Couple de pointe maximum :

7/ Contrôle des alésages

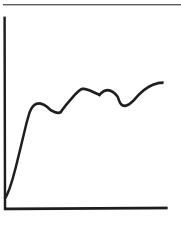
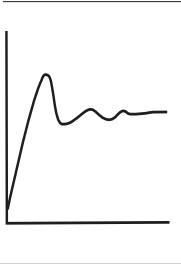
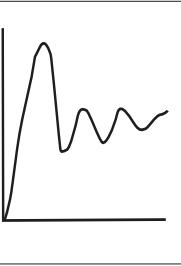

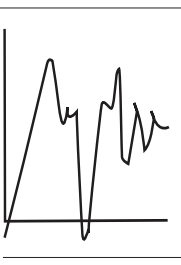

Les diamètres des bouts d'arbre étant connus, contrôler que les alésages correspondants peuvent être réalisés.

Si les accouplements doivent être fournis alésés et rainurés, il y a lieu d'indiquer les cotes exactes et les tolérances désirées.

Selection

Selección

Sélection

	Load Classifications Clasificación de cargas Classifications des charges	Service Factors Factores de servicio Facteur de Service S_R
	Continuous Service and running Loads vary only slightly El servicio continuo y las cargas de funcionamiento varían sólo ligeramente Service continu et le fonctionnement en charge varie seulement légèrement	1.0
	Torque loading varies during operation of equipment Epar de carga varía durante el funcionamiento del equipo. Le couple varie pendant le fonctionnement	1.5
	Torque varies during operation, frequent stop/start cycles are encountered El par de torsión varía durante la operación, se encuentran numerosos ciclos de encendido y parada Le couple varie pendant le fonctionnement comportant des démarrages / freinage fréquents	2.0
	For shock loading and substantial torque variations Para carga de choque y variaciones importantes del par de torsión Pour des chocs en charge et des variations de couple importantes	2.5
	For heavy shock loading or light reversing drives Para fuerte carga de choque o ligeros impulsos de inversión Pour des chocs importants ou de légères inversion de sens de rotation	3.0
	Reversing torque loads do not necessarily mean reversal of rotation. Depending on severity of torque reversal, such loads must be classified between "medium" and "extreme". La inversión de las cargas del par de torsión no significa necesariamente la inversión de la rotación. Dependiendo de la gravedad de la inversión del par de torsión, dichas cargas deben clasificarse entre "medias" y "extremas" Inversions de couple ne voulant pas forcément dire inversion de rotation. Cela dépend de la sévérité de l'inversion de couple, aussi les charges doivent être classées entre "moyenne" et "extrême".	Consult factory Consúltenos Nous consulter

* If the application is not listed in pages 14 and 15, use the factor S_R in place of SF.

* Si la aplicación no aparece listada en f las páginas 14 y 15, utilice el factor SR en lugar del SF.

* Si l'application n'est pas trouvée dans la liste des pages 14 et 15, remplacer SF par le facteur SR ci-dessus.

SF	Service Factor	Factor de servicio	Facteur de service
	AGITATORS	AGITADORES	AGITATEURS
1.5	Pure Liquids	Líquidos puros	Liquides purs
2.0	Variable density	Densidad variable	Densité variable
1.5	ALTERNATOR	ALTERNADOR	ALTERNATEUR
	BLOWERS	SOPLANTES	MACHINES SOUFFLANTES
1.0	Centrifugal	Centrifugos	Centrifuges
1.5	Lobe	De lóbulos	A lobes
1.5	Vane	De paletas	A pales
2.0	BRIQUETTER MACHINES	BRIQUETEADORAS	MACHINES DE BRIQUETERIE
1.0	CAN FILLING MACHINES	RELLENADORAS DE LATAS	MACHINES DE MISE EN BOÎTE
2.0	CANE KNIVES	CUCHILLAS PICADORAS DE CAÑA	COUPE BAMBOU
2.0	CAR DUMPERS	VUELCAVAGONES	COMPACTEUR
2.0	CAR PULLERS	TORNOS ARRASTRADORES DE VAGONES	VEHICULE DE REMORQUAGE
2.0	CLAY WORKING MACHINERY	MAQUINARIA PARA TRABAJAR ARCILLA	MACHINES DE TRAVAIL DE L'ARGILE
	COMPRESSORS	COMPRESORES	COMPRESSEURS
1.0	Centrifugal	Centrifugos	Centrifuge
1.5	Lobe, Vane, Screws	De lóbulos, de paletas, con tornillos	A lobes, à pales, à vis
*	Reciprocating - Multi-Cylinder	De pistón - Policilindrico	A piston, multicylindre
1.0	Axial	Axial	Axial
	CONVEYORS	CINTAS TRANSPORTADORAS	CONVOYEURS
1.5	Uniformly loaded or fed	De alimentación o carga uniforme	Chargé ou alimenté uniformément
3.0	Heavy duty - not uniformly fed	De alta resistencia - de carga no uniforme	Service lourd - alimenté non uniformément
2.0	CRANES AND HOISTS	GRÚAS Y POLIPASTOS	LEVAGE
3.0	CRUSHERS	TRITURADORES	CONCASSEURS
	DREDGES	DRAGAS	DRAGAGE
2.0	Cable Reels	Carretes de cables	Enrouleurs de câble
2.0	Conveyors	Cintas transportadoras	Convoyeurs
3.0	Cutter Head Drives	Excavadoras	Excavatrices
3.0	Jig Drives	Arrastre de plantillas	Entraînement de calibre
2.5	Maneuvering Winches	Tornos de maniobras	Treuil de manoeuvre
2.0	Pumps	Bombas	Pompes
2.0	Screen Drives	Arrastre de tamiz	Entraînement de cribles
2.0	Stackers	Apiladoras	Entasseurs
2.0	Utility Winches	Tornos utilitarios	Treuil utilitaire
	ELEVATORS	ELEVADORES	ELEVATEURS
2.5	Bucket	Con cubetas	A godets
2.5	Centrifugal Discharge	De descarga centrifuga	A déchargement centrifuge
2.5	Escalators	Rodantes	Escaliers roulants
2.0	Freight	Montacargas	Monte charge
2.5	Gravity Discharge	De descarga por gravedad	A déchargement par gravité
	EXTRUDERS	EXTRUSORAS	EXTRUDEURS
2.0	Plastic	Plástico	Matières plastiques
2.5	Metal	Metal	Matières métalliques
	FANS	VENTILADORES	VENTILATEURS
	Centrifugal	Centrifugos	Centrifuges
1.5	Forced Draft	Corriente forzada	Flux forcé
1.5	Induced Draft	Corriente inducida	Flux induit
	Axial	Axial	Axial
1.5	Forced Draft	Corriente forzada	Flux forcé
1.5	Induced Draft	Corriente inducida	Flux induit
2.0	Mine Ventilation	Ventilación de minas	Ventilation de mines
2.0	Cooling Towers	Torres de ventilación	Tour de réfrigération
1.0	Light Duty Blower & Fans	Ventiladores y soplantes para trabajos ligeros	Ventilateurs peu chargés
	FEEDERS	ALIMENTADORES	ALIMENTATEURS
1.5	Light Duty	Para trabajos ligeros	Service léger
2.5	Heavy Duty	Para trabajos pesados	Service lourd
	FOOD INDUSTRY	INDUSTRIA ALIMENTICIA	INDUSTRIE ALIMENTAIRE
2.0	Beet Slicer	Rebanadora de remolacha	Coupe betteraves
1.5	Cereal Cooker	Tostador de cereales	Four à céréales
2.0	Dough Mixer	Amasadora	Pétrins, mélangeurs
2.0	Meat Grinders	Picadoras de carne	Hachoirs à viande
1.0	Can Filling Machine	Rellenadora de latas	Machines de mise en boîte
1.5	Bottling	Embotellado	Machines à embouteiller
	GENERATORS	GENERADORES	GENERATRICES
1.0	Non-Welding	Excepto soldadura	Normales
3.0	Welding	Para soldadura	De soudure
2.5	HAMMER MILLS	TRITURADORAS DE MARTILLOS	BROYEURS A MARTEAUX
	LUMBER INDUSTRY	INDUSTRIA MADERERA	INDUSTRIE DU BOIS
2.0	Barkers - Drum Type	Descortezadoras - De tambor	Ecorcheur type tambour
2.0	Edger Feed - Live Rolls	Alimentación de canteadora - Rodillos activos	Transporteurs à chaines
2.0	Log Haul - Incline	Arrastre de troncos - Plano inclinado	Transporteur de bûches - Incliné
2.0	Log Haul - Well Type	Arrastre de troncos - En pozo	Transporteur de bûches - Normal
2.0	Planer Feed Chains	Cadenas de alimentación de la cepilladora	Chaînes d'alimentation de raboteuse
2.0	Planer Tilting Hoist	Polipasto basculante de la cepilladora	Portique d'inclinaison de rabotage
1.5	Slab Conveyor	Cinta transportadora de costeros	Convoyeur de plaque
1.5	Sorting Table	Mesa de clasificación	Table de triage
2.0	Trimmer Feed	Alimentación de recortadora	Alimentation de machine à trancher
	MACHINE TOOLS	MÁQUINAS HERRAMIENTA	MACHINES OUTIL
2.0	Bending Roll	Rodillo plegador	Cintreuse, pleuse
1.5	Plate Planer	Cepilladora para chapas	Machine à planer
2.0	Punch Press - Gear Driven	Prensa punzonadora - Accionada por engranajes	Poinçonneuses
2.5	Tapping Machines	Fileteadoras	Machines à tarauder
	Other Machines Tools	Otras máquinas herramienta	Autres machines outil
1.5	Main Drives	Impulsores principales	Entraînement principal
1.5	Auxiliary Drives	Impulsores auxiliares	Entraînement auxiliaire
	METAL MILLS	METALURGIA	METALLURGIE
2.0	Draw - Bench - Carriage	Carro de máquina estiradora	Bancs à tréfiler - Chargement
2.0	Draw - Bench - Main Drive	Impulsor principal de máquina estiradora	Bancs à tréfiler - Entraînement principal
2.5	Forming Machines	Formadoras	Machine de formage
2.0	Slitters	Sierras longitudinales	Fendoir
	Table Conveyor	Mesa transportadora	Convoyeur
3.0	Non-Reversing	No reversible	Non réversible
4.5	Reversing	Reversible	Réversible
2.0	Wire Drawing & Flattening Machine	Trefiladora y aplanadora de cables	Machine à tréfiler & à laminer le fil
2.0	Wire Winding Machine	Enrolladora de alambre	Bobineuse de fil
	MILLS ROTARY TYPE	MOLINOS DE TIPO ROTATORIO	BROYEURS ROTATIFS
3.0	Ball	De bolas	A boulets
2.5	Cement Kilns	Hornos de cemento	Four à ciment
2.0	Dryers & Coolers	Secadores y enfriadores	Sécheurs & Refroidisseurs
2.5	Kilns	Hornos	Fours
2.0	Pebble	De cantos	A galets
3.0	Rod	De varillas	A barres
2.0	Tumbling Barrels	Tambores desarenadores	Tambour désableur
	MIXERS	MEZCLADORAS	MELANGEURS
2.0	Concrete Mixers	Hormigoneras	Bétonnières
2.0	Drum Type	Factor de servicio	Tambours
	OIL INDUSTRY	INDUSTRIA PETROLERA	PETROCHIMIE
1.5	Chillers	Refrigeradores	Réfrigérateurs
2.0	Oil Well Pumping	Bombeo de pozos petrolíferos	Pompe à puits de pétrole
2.0	Paraffin-Filter-Press	Prensa de filtro de parafina	Filtres-presses pour paraffine

SF	Service Factor	Factor de servicio	Facteur de service
2,5	Rotary Kilns	Hornos giratorios	Fours rotatifs
	PAPER MILLS	FÁBRICAS DE PAPEL	PAPETERIE
2,0	Barker Auxiliaries Hydraulic	Accesorios para descortezadoras, hidráulicos	Hydraulique auxiliaire d'écorcheur
2,0	Barker Mechanical	Descortezadora mecánica	Ecorcheur mécanique
3,0	Barking Drum (Spur Gear Only)	Tambor de descortezado (sólo engranaje recto)	Tambour écorcheur (Engrenage droit seulement)
2,0	Beater & Pulper	Batidor y desintegrador	Pulpeur
1,0	Bleacher	Blanqueadora	Blanchiment
2,5	Calenders	Calandria	Calandres
1,5	Converting Machines except Cutters	Máquinas conversoras excepto cortadoras	Machine de conversion sauf couteaux
2,0	Couch	Prensa manchón	Coucheuse
2,0	Cutters	Cortadoras	Couteaux
2,0	Cylinders	Cilindros	Cylindres
2,0	Dryers & Coolers	Secadoras y enfriadoras	Sécheurs & refroidisseurs
1,5	Felt Stretcher	Tensor de fieltro	Rouleaux presseurs
2,0	Felt Whipper	Dedos de arrastre de fieltro	Rouleaux entraîneurs
2,5	Log Haul	Transportador de troncos	Traine grume
2,5	Presses	Presas	Presses
2,0	Reel	Carrete	Dévidoir
2,5	Suction Roll	Rodillo de succión	Rouleaux aspirants
2,0	Washers and Thickeners	Arandelas y espesadoras	Laveurs et épaisseuriers
2,0	Winders	Enrolladoras	Enrouleur
1,5	PRINTING PRESSES	PRENSAS DE IMPRESIÓN	IMPRIMERIE
2,0	BARGE HAUL PUMPS	REMOLQUE DE BARCAZAS BOMBAS	REMORQUEURS POMPES
	Centrifugal	Centrifugas	Centrifuges
1,0	General Duty (Liquid)	Para uso general (líquidos)	Usage général (Liquide)
*	Boiler Feed	Alimentación de calderas	Alimentaires
1,5	Slurry (Sewage etc.)	Fangos (alcantarillado, etc.)	Relevage d'eaux usées
2,0	Dredge	Drenaje	Drague
	Reciprocating	Aspirante e impelente	A pistons
*	Double Acting	De doble acción	Double effet
	Single Acting	De acción única	Simple effet
*	1 or 2 Cylinders	1 o 2 cilindros	1 ou 2 cylindres
*	3 or more Cylinders	3 o más cilindros	3 cylindres ou plus
1,5	Rotary - Gear, Lobe, Vane	Giratorias: mediante engranajes, lóbulos, paletas	A engrenage, à lobes, à pales
	RUBBER INDUSTRY	INDUSTRIA DEL CAUCHO	INDUSTRIE DU CAOUTCHOUC
3,0	Mixer - Banbury	Mezcladora - Banbury	Malaxeur
2,5	Rubber Calendar	Calandria de caucho	Calandre
2,5	Rubber Mill (2 or more)	Laminadora de caucho (2 o más)	Laminoirs
2,0	Sheeter	Resmadora	Massicot
2,5	Tire Building Machines	Máquinas para fabricación de neumáticos	Machines pour fabrications des pneumatiques
1,0	Tire & Tube Press Openers	Abridoras de prensa de neumáticos y cámaras	Ouverture des presses à pneumatiques
2,0	Strainers	Depuradoras	Raidisseurs
	SCREENS	PANTALLAS	CRIBLES
1,0	Air Washing	Lavado de aire	Filtre à air
1,5	Rotary - Stone or Gravel	Giratorias - piedra o gravilla	Rotatif - Pierres ou graviers
1,5	Traveling Water intake	Admisión de agua en movimiento	A circulation d'eau
2,5	Vibratory	Vibratoria	Vibreur
1,5	SEWAGE DISPOSAL EQUIPMENT	EQUIPO DE DEPURACIÓN DE AGUAS RESIDUALES	EQUIPEMENT DE TRAITEMENT DES EAUX
1,5	SEWAGE TREATMENT PUMPS	BOMBAS DE TRATAMIENTO DE AGUAS RESIDUALES	POMPES DE TRAITEMENT DES EAUX
	TEXTILE INDUSTRY	INDUSTRIA TEXTIL	INDUSTRIE TEXTILE
2,0	Calenders	Calandrias	Calandres
2,0	Card Machines	Máquinas de tarjetas	Cardeuses
2,0	Cloth - Finishing Machines (washers, pads, tenters, dryers, calenders, etc.)	Tela - Máquinas acabadoras (lavadoras, fulards, tensoras, secadoras, calandrias, etc.)	Machines de finition de l'habillement (Machines à laver, sécheurs, calandres, etc.)
2,0	Dry Cans	Tamboros secadores	Machines à cannettes
1,5	Dryers	Secadoras	Sécheurs
1,0	Dyeing Machinery	Teñidoras	Machines à teinter
2,0	Looms	Telares	Métier à tisser
1,5	Mangles	Calandradoras	Essoreuses à rouleaux
1,5	Nappers	Perchadoras	Molletonneuses
1,5	Soapers	Enjabonadoras	Savonneurs
2,0	Spinners	Hiladoras	Fileurs
2,0	Tenter - Frames	Rama tensora - Marcos	Machine à mèches
2,0	Winders (other than Batchers)	Devanadoras (excepto enrolladoras-desenrolladoras)	Bobineuses
2,0	WINDLASS	MOLINETE	TREUILS ET GUINDEAUX
1,5	WOODWORKING MACHINERY	MAQUINARIA PARA TRANSFORMACIÓN DE LA MADERA	MACHINE A BOIS
	Note:	Nota:	Nota :
*	Consult supplier	Consulte con su proveedor	Consulter le fournisseur

Ambiant Temperature Temperatura ambiente Temperature Ambiante	Service Factor S _t * Factor de servicio S _t * Facteur de Service S _t *
50° < T° 66°	0,25
66° < T° 74°	0,5
74° < T° 82°	0,75
82° < T° 93°	1

* For relative humidity < 50%
for humidity relative > 50% consult us

In general, the Viva service factor adjustment for high temperature is in addition to the service factor consideration for the driver and driven equipment. However, if high temperatures are typical for a specific application, maximum temperature consideration is incorporated into the "typical" service factor (e.g steel mill tables conveyors).

* Para una humedad relativa < 50 %
para una humedad relativa > 50 % consútenos

En general, el ajuste del factor de servicio Viva para altas temperaturas se añade a la consideración del factor de servicio para el equipamiento impulsado e impulsor. Sin embargo, si son típicas las temperaturas altas para una aplicación específica, la consideración de la temperatura máxima se incorpora en el factor de servicio "típico" (por ejemplo, mesas transportadoras en acerías).

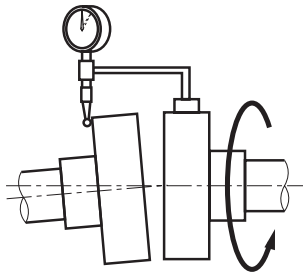
* Pour humidité relative < 50%
au delà nous consulter

Cependant, si les températures sont typiques pour une application spécifique, la notion de temperature maximum est incorporée dans le facteur de service typique (par exemple convoyeurs de sidérurgie)

Alignment

Alignment significantly impacts the life cycle of transmission components. Shaft misalignment produces stress on the couplings and the engine and reduction gear box bearings and shafts, leading to damage. Moreover, the higher the rotational speed, the more stringent the alignment accuracy requirement.

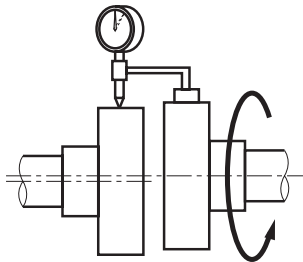
In general, radial, angular, and in certain cases, axial misalignments occur simultaneously. For misalignments not to induce an unacceptable aggravated fault, alignment adjustment shall not be made based on the values given in the catalogue or technical manuals.



Angular Alignment

Use a sturdy means to attach a dial indicator to a shaft or hub and read off the opposite hub's flange as shown below.

With the indicator set to zero, check the shaft alignment by rotating the shaft and recording the maximum and minimum reading on the dial indicator. This values' difference should not exceed the published value (b-a) for each type of coupling.



Radial Alignment

Use a sturdy means to attach a dial indicator to a shaft or hub and read off the opposite hub's external referenced diameter as shown below.

With the indicator set to zero, check the shaft alignment by rotating the shaft and recording the maximum and minimum reading on the dial indicator. This values' difference should not exceed the published value Δr for each type of coupling.

Alineación

La alineación influye de manera significativa en el ciclo vital de los componentes de la transmisión. Una mala alineación de los árboles produce esfuerzos sobre los acoplamientos, el motor, y los rodamientos y árboles de la caja de cambios, lo cual se traduce en daños. Además, cuanto más alta sea la velocidad de giro, más estricta es la necesidad de precisión de la alineación.

En general, las malas alineaciones radiales, angulares y, en ciertos casos, axiales, se presentan a la vez. Para que la falta de alineación no provoque un fallo acumulado inaceptable, el ajuste de la alineación no deberá realizarse basándose en los valores máximos proporcionados en el catálogo o en los manuales técnicos.

Alineación angular

Utilice un medio resistente para unir un reloj comparador a un árbol o cubo, y lea en el reborde del núcleo opuesto, según se muestra en la figura.

Con el indicador en cero, compruebe la alineación de los árboles girando el árbol y anotando las lecturas máxima y mínima mostradas por el reloj comparador. La diferencia entre estos valores no debería superar el valor publicado (b-a) para cada tipo de acoplamiento.

Alineación radial

Utilice un medio resistente para unir un reloj comparador a un árbol o cubo, y lea el perímetro exterior, referenciado, del núcleo opuesto según se muestra en el esquema.

Con el indicador a cero, compruebe la alineación de los árboles girando el eje, y anotando las lecturas máxima y mínima en el reloj comparador. La diferencia entre estos valores no debería exceder el valor publicado Δr para cada tipo de acoplamiento.

Alignement

L'alignement joue un rôle prépondérant sur la durée de vie des éléments d'une transmission. Un mauvais alignement des arbres, produit un effort sur les accouplements et les roulements des arbres du moteur et du réducteur provoquant leur détérioration. De plus, l'accélération des vitesses de rotation augmente la précision nécessaire de l'alignement.

En général, les défauts d'alignements radiaux, angulaires et dans certains cas, axiaux surviennent simultanément. Afin que ceux-ci n'induisent pas un défaut total non acceptable, le réglage de l'alignement ne devra pas afficher les valeurs maximales données dans le catalogue ou les notices techniques.

Alignement Angulaire

Pour compenser un défaut d'alignement angulaire, fixer un comparateur solidement sur l'un des plateaux ou moyeux de sorte de le point de mesure soit effectué sur l'une des faces de l'autre plateaux ou moyeu.

Le comparateur réglé à zéro, faire tourner l'arbre supportant le comparateur et relever les valeurs minimale et maximale affichées. Dans un premier temps, la différence de ces valeurs ne doit pas excéder la valeur (b-a) indiquée pour chaque type d'accouplement.

Alignement Radial

Pour compenser un défaut d'alignement radial, fixer un comparateur solidement sur l'un des plateaux ou moyeux de sorte de le point de mesure soit effectué sur la circonférence de l'autre plateaux ou moyeu.

Le comparateur réglé à zéro, faire tourner l'arbre supportant le comparateur et relever les valeurs minimale et maximale affichées. Dans un premier temps, la différence de ces valeurs ne doit pas excéder la valeur Δr indiquée pour chaque type d'accouplement.

Alignment

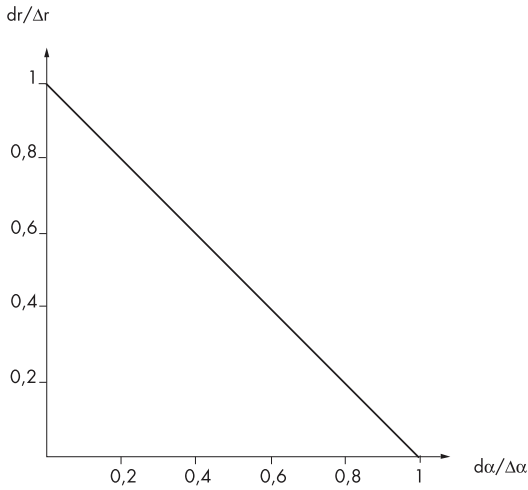
Record each misalignment value, calculate the ratio of this value by the maximum indicated value. The sum of these ratios shall not exceed 1:

$$dr/\Delta r + d\alpha/\Delta\alpha \leq 1$$

where:

- dr = recorded radial misalignment value
- Δr = max. radial misalignment value
- d α = recorded angular misalignment value
- $\Delta\alpha$ = max. angular misalignment value

Correct alignment if this sum is greater than 1.



V110 - V170

Alineación

Anote cada valor de falta de alineación y calcule la razón de este valor respecto al valor máximo indicado. La suma de estas razones no debería superar 1:

donde:

- dr = valor registrado de mala alineación radial
- Δr = máx. valor de mala alineación radial.
- d α = valor registrado de mala alineación angular
- $\Delta\alpha$ = máx. valor de mala alineación angular

Rehaga la alineación si esta suma es superior a 1.

Alignement

Relever chaque valeur de désalignement, faire le rapport de cette valeur par la valeur maximum indiquée. La somme de ces rapports ne doit excéder 1, c'est à dire :

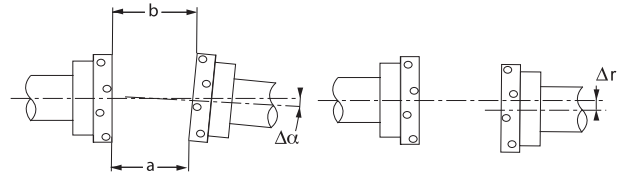
où :

- dr = valeur de désalignement radial relevée
- Δr = valeur de désalignement radial max.
- d α = valeur de désalignement angulaire relevée
- $\Delta\alpha$ = valeur de désalignement angulaire max.

Affiner l'alignement si cette somme est supérieure à 1.

Size Tamaño Taille	110	125	130	150	170	190	215	245	290	365	425	460
(b - a) mm	4,2	4,9	5,5	6,1	6,6	6,1	7,3	8,9	11,2	8,2	9,9	9,4
³ r mm	1,6	1,6	1,6	1,6	1,6	2,4	2,4	2,4	2,4	3,2	3,2	3,2

V190 - V290



Installation

1 - Install and secure both hubs to the shaft using a half element using the capscrew hole pattern that best accommodates the shaft gap requirements.

2 - Rotate the shaft 180° and install the other half element side to side if the shaft cannot be rotated

3 - Check the capscrews for proper installation torque and you are done. Element replacement does not require moving the hubs or connected equipment.

Instalación

1 - Instale y fije bien ambos núcleos a los árboles utilizando una mitad, siguiendo el modelo de orificios para tornillos que mejor, se ajuste a los requisitos de distancia entre árboles.

2 - Rote el árbol 180° e instale la otra mitad restante al lado de la otra si el eje no puede rotar.

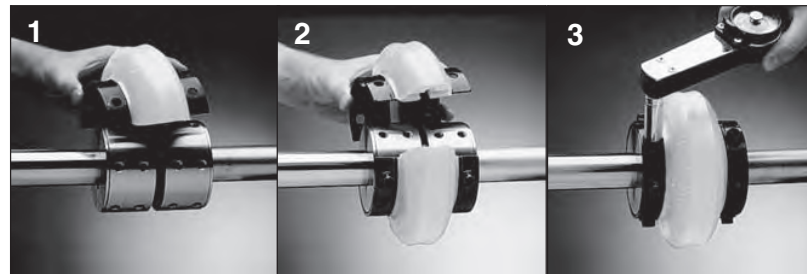
3 - Compruebe que los tornillos están apretados hasta el par de apriete necesario y eso es todo. El recambio de los elementos no necesita mover los núcleos ni el equipo conectado.

Montage

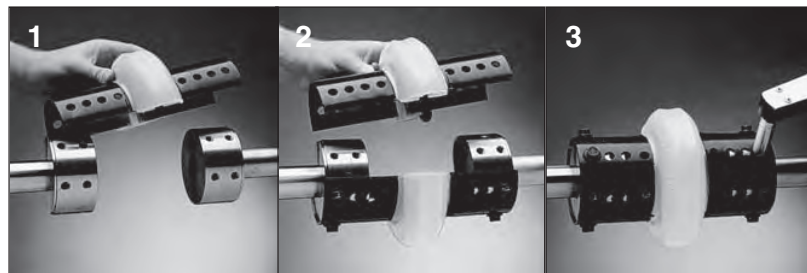
1 - Installer et bien fixer les deux moyeux sur l'arbre en utilisant un demi-élément élastique comme patron pour l'espace entre moyeux. Positionner le demi-élément du dessus en utilisant les trous des vis qui s'accomodent au mieux des conditions requises d'espace entre bout d'arbres

2 - Tourner l'arbre à 180° et installer l'autre demi-élément. Monter les demi-éléments côte à côte si l'arbre ne peut être tourné.

3 - Vérifier le couple de serrage des vis et c'est tout. Le remplacement des éléments ne nécessite pas de déplacer les moyeux et/ou réaligner l'équipement connecté.



Rex Viva Close-Coupled Couplings - Acoplamientos Rex Viva estándar - Accouplement Rex Viva Standard



Rex Viva Spacer Couplings - Acoplamientos Rex Viva largos - Accouplement Rex Viva Version longue

See installation and maintenance instructions for additional information.

Consulte las instrucciones de instalación y mantenimiento para más información.

Voir la notice d'installation et de maintenance pour de plus amples informations.

Features and Benefits

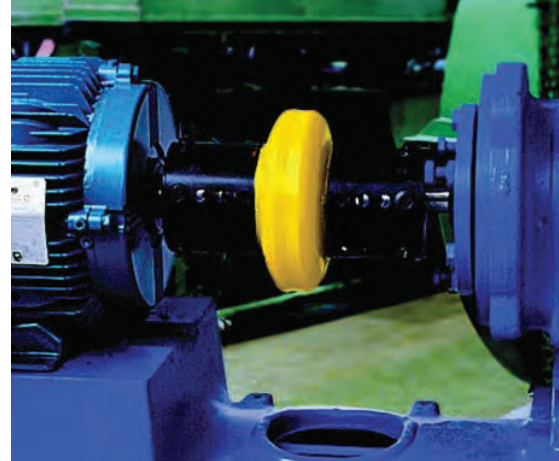
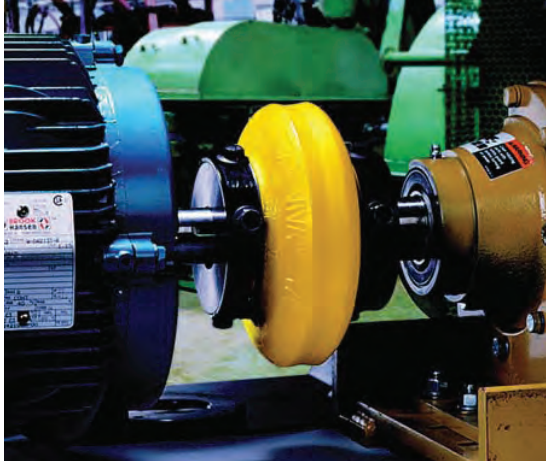
The new Rex Viva Coupling is a unique general purpose coupling ideal for use in industrial applications such as pumps, compressors, blowers, mixers and many other drive applications.

Características y beneficios

El nuevo acoplamiento Rex Viva es un acoplamiento exclusivo de uso general ideal para ser utilizado en aplicaciones industriales como bombas, compresores, soplantes, mezcladoras y muchas otras aplicaciones impulsoras.

Caractéristiques et avantages

Le nouvel accouplement Rex Viva est un accouplement à usage général idéal pour l'utilisation dans les applications industrielles comme les pompes, compresseurs, ventilateurs, mélangeurs et beaucoup d'autres



Feature

- Split-in-half flex element design
- Radial bolting
- Special formulated polyurethane flex element

- Torsionally Soft

- High misalignment capacity
- Visual inspection
- Interchangeable hubs

Característica

- Diseño del elemento flexible dividido en dos
- Pernos radiales
- Elemento flexible de poliuretano especialmente formulado

- Flexible a la torsión

- Alta capacidad de compensación de alineaciones

- Inspección visual
- Núcleos intercambiables

Caractéristiques

- Élément flexible en deux parties symétriques

- Montage radial des vis
- Élément flexible en polyuréthane formulé spécialement

- Souple en torsion

- Grande acceptation des défauts d'alignement

- Inspection visuelle
- Moyeux interchangeables

Benefit

- Easy replacement without moving the hubs or connected equipment.
- Capscrews are easily accessible in tight spaces.
- Optimal tensile strength and fatigue resistance.
- Excellent chemical and environmental aging resistance.
- No lubrication required.
- Protects equipment by cushioning shock loads and dampening torsional vibration.
- Accommodates unavoidable misalignment with low reactionary forces.
- No need for coupling disassembly to inspect.
- Close-coupled and spacer coupling hubs are identical allowing reduced inventories.

Beneficio

- Fácil recambio sin mover los núcleos ni el equipamiento conectado.
- Puede accederse fácilmente a los tornillos en espacios reducidos.
- Óptima resistencia a la tracción y a la fatiga.
- Excelente resistencia al envejecimiento por factores químicos y ambientales.
- No se necesita lubricación alguna.
- Protege el equipo absorbiendo las cargas de choque y la vibración de torsión.
- Admite una mala alineación de cracter inevitable, con unas fuerzas de reacción bajas en los rodamientos de los árboles.
- No se necesita desmontar los acoplamientos para revisarlos.
- Los núcleos o cubos de los acoplamientos estándar y largos son idénticos, lo cual reduce el inventario.

Avantages

- Remplacement facile sans déplacement des moyeux ou des équipements connectés.
- Les vis sont facilement accessibles dans les espaces réduits.
- Résistance optimale à la traction et à la fatigue.
- Excellente résistance chimique et au vieillissement.
- Pas de lubrification.
- Protège les équipements en absorbant les chocs et en amortissant les vibrations de torsion.
- S'accommode des inévitables défauts d'alignement avec des faibles forces de réaction.
- Démontage de l'accouplement non nécessaire pour l'inspection.
- Les moyeux pour accouplement version standard et version longue sont identiques, permettant ainsi des stocks réduits.

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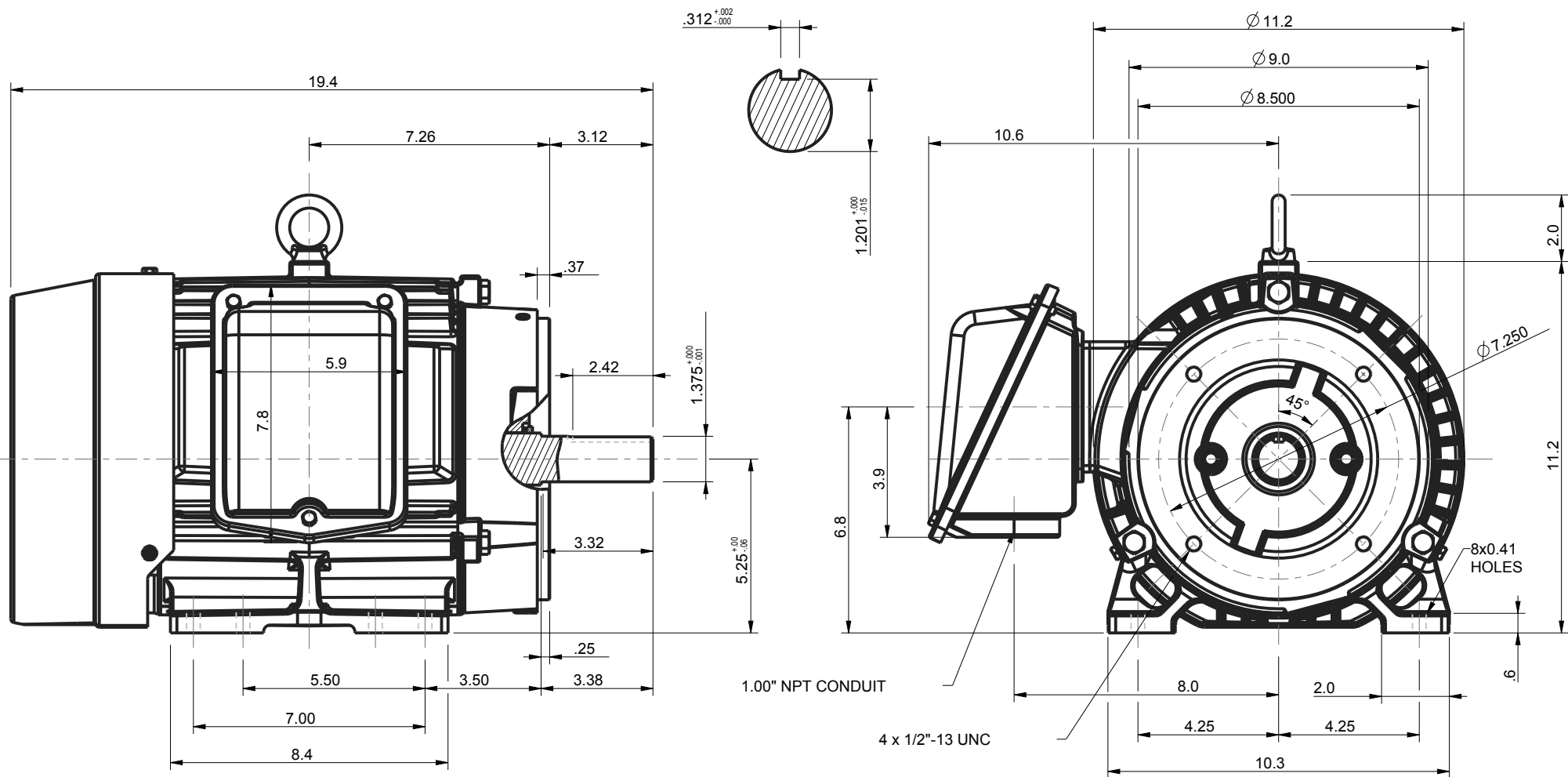
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Fax: +32 / 70 22 33 67

Email :

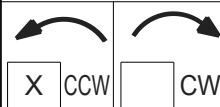
Customerservice.Belgium@rexnord.com

www.rexnord.eu



UNITS: INCHES

ROTATION FROM NDE



NOTES:

1. MAIN CONDUIT BOX MAY BE ROTATED IN 90° INCREMENTS
2. STANDARD PRODUCT USES BI-DIRECTIONAL FAN. OPPOSITE ROTATION AVAILABLE ONLY BY CONNECTION CHANGE.
3. KEY DIMENSIONS EQUAL 0.312"x 0.312"x 2.38" (MOTOR SUPPLIED WITH KEY)

TOSHIBA RESERVES THE RIGHT TO MAKE CHANGES OF TECHNICAL IMPROVEMENT AND THE DATA MAY CHANGE WITHOUT NOTICE

PRELIMINARY

DO NOT USE FOR CONSTRUCTION, INSTALLATION, OR APPLICATION PURPOSES UNLESS THE DRAWING IS MARKED AS CERTIFIED

CERTIFIED

TOSHIBA



www.toshiba.com/tic

TOSHIBA INTERNATIONAL CORPORATION

TOTALLY ENCLOSED FAN COOLED
FOOTED C-FACED
3 PHASE INDUCTION MOTOR
213TC-215TC F1 ASSEMBLY

DRAWING #: MDSL003-03

REV. DATE: 06/27/18 REV. #: 2 PER.: M. O'DOWD

REV. DESCRIP.:



Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

TYPICAL MOTOR PERFORMANCE DATA

Model: 0104SDSR42A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
10	7.5	4	1760	215TC	230/460	60	3	26/12.8
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.15	CONT	91.7	B	H	40 C

Load	HP	kW	Amperes	Efficiency (%)	Power Factor (%)
Full Load	10	7.5	12.7	91.6	80.2
¾ Load	7.50	5.6	10.1	91.0	76.2
½ Load	5.00	3.7	7.8	88.9	67.1
¼ Load	2.50	1.9	6.1	81.7	46.3
No Load			5.7		6.0
Locked Rotor			81		45.7

Torque				Rotor wk ² Inertia (lb-ft ²)
Full Load (lb-ft)	Locked Rotor (% FLT)	Pull Up (% FLT)	Break Down (% FLT)	
29.8	260	225	330	1.34

Safe Stall Time(s)		Sound Pressure dB(A) @ 1M	Bearings*		Approx. Motor Weight (lbs)
Cold	Hot		DE	NDE	
35	15	-	6308ZZC3	6308ZZC3	205

*Bearings are the only recommended spare part(s).

Motor Options:
 Product Family:EQP Global SD CFace Footed
 Mounting:C-Face Footed,Shaft:T Shaft

Customer	
Customer PO	
Sales Order	
Project #	

Tag:

All characteristics are average expected values.

TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	bmammen	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1119 / 1
Engr. Date	8/22/2019	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019



Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

TYPICAL MOTOR PERFORMANCE DATA

Model: 0104SDSR42A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
10	7.5	4	1450	215TC	190/380	50	3	31/15.5
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.0	CONT	89.5	B	H	40 C

Load	HP	kW	Amperes	Efficiency (%)	Power Factor (%)
Full Load	10	7.5	15.5	91.6	79.5
¾ Load	7.50	5.6	11.7	92.1	75.7
½ Load	5.00	3.7	8.6	91.5	66.9
¼ Load	2.50	1.9	5.5	83.6	61.1
No Load			5.5		5.5
Locked Rotor			100		44.7

Torque				Rotor wk ² Inertia (lb-ft ²)
Full Load (lb-ft)	Locked Rotor (% FLT)	Pull Up (% FLT)	Break Down (% FLT)	
36.2	200	180	250	1.34

Safe Stall Time(s)		Sound Pressure dB(A) @ 1M	Bearings*		Approx. Motor Weight (lbs)
Cold	Hot		DE	NDE	
26	14	-	6308ZZC3	6308ZZC3	205

*Bearings are the only recommended spare part(s).

Motor Options:
 Product Family:EQP Global SD CFace Footed
 Mounting:C-Face Footed,Shaft:T Shaft

Customer	
Customer PO	
Sales Order	
Project #	

Tag:

All characteristics are average expected values.

TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	jhock	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1119 / 1
Engr. Date	4/9/2014	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019



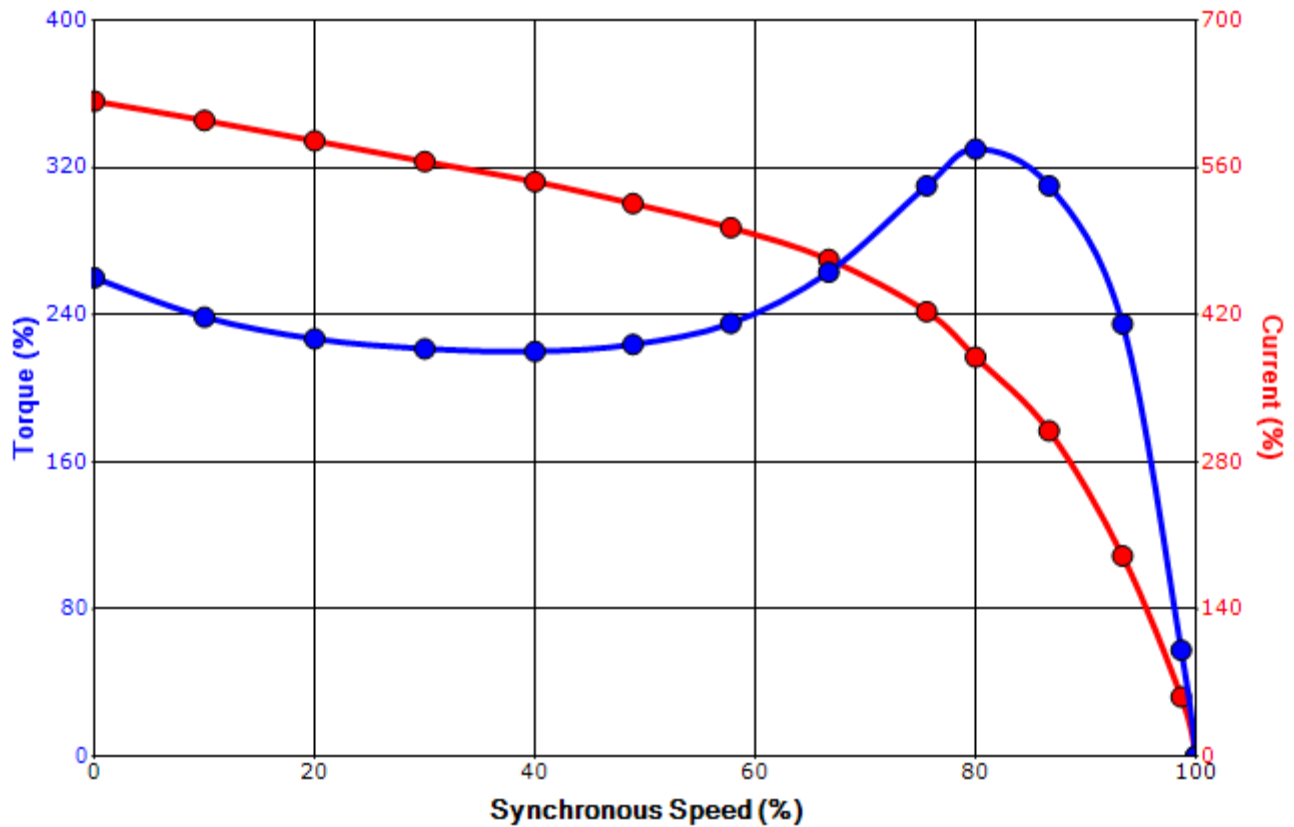
Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

SPEED TORQUE/CURRENT CURVE

Model: 0104SDSR42A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
10	7.5	4	1760	215TC	230/460	60	3	26/12.8
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.15	CONT	91.7	B	H	40 C
Locked Rotor Amps	Rotor wk ² Inertia (lb-ft ²)	Torque						
		Full Load (lb-ft)	Locked Rotor (%)	Pull Up (%)	Break Down (%)			
81	1.34	29.8	260	225	330			

Design Values



Customer		wk ² Load Inertia (lb-ft ²)	-
Customer PO		Load Type	-
Sales Order		Voltage (%)	100
Project #		Accel. Time	-

Tag:

All characteristics are average expected values.

TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	bmammen	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1121/1
Engr. Date	8/22/2019	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019



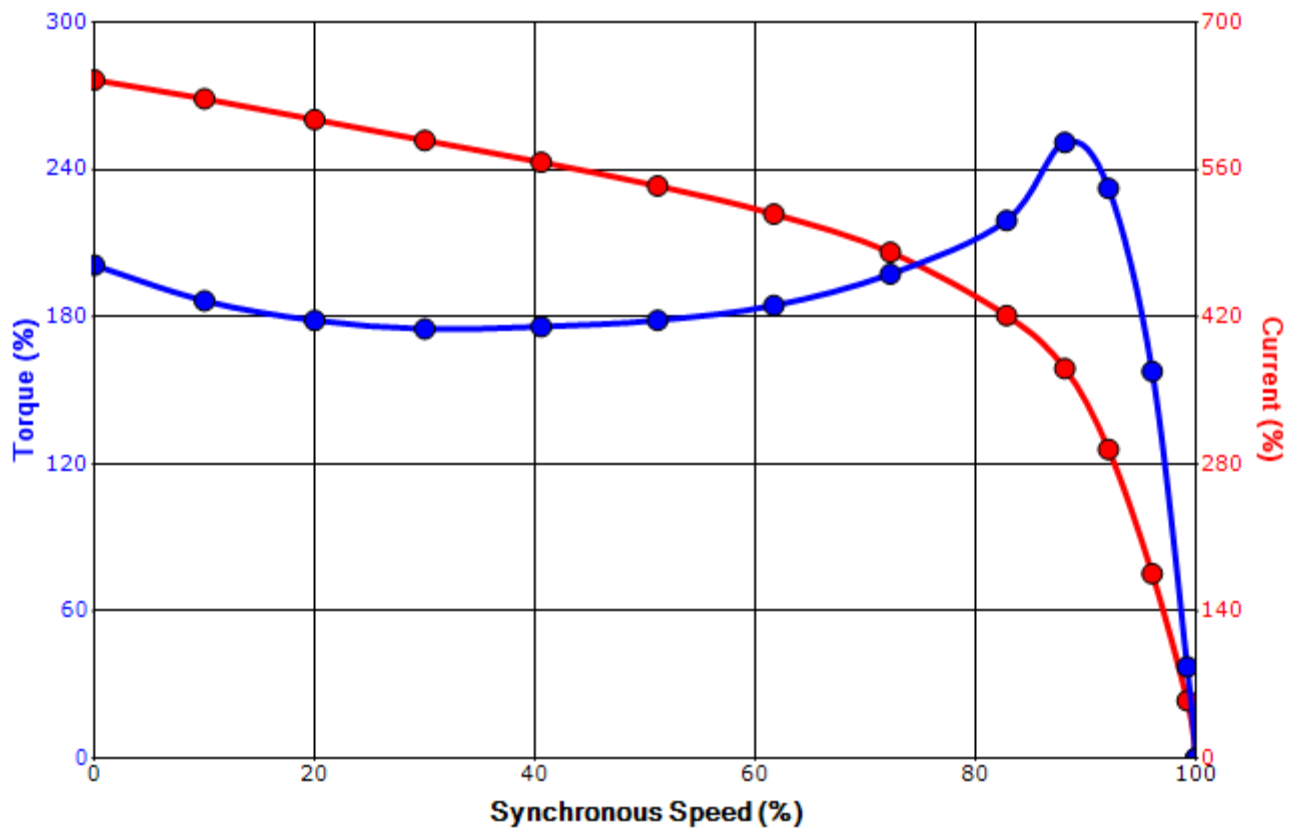
Issued Date	12/18/2019	Transmit #	
Issued By	dschoeck	Issued Rev	

SPEED TORQUE/CURRENT CURVE

Model: 0104SDSR42A-P

HP	kW	Pole	FL RPM	Frame	Voltage	Hz	Phase	FL Amps
10	7.5	4	1450	215TC	190/380	50	3	31/15.5
Enclosure	IP	Ins. Class	S.F.	Duty	NEMA Nom. Eff.	NEMA Design	kVA Code	Ambient (°C)
TEFC	55	F	1.0	CONT	89.5	B	H	40 C
Locked Rotor Amps	Rotor wk ² Inertia (lb-ft ²)	Torque						
		Full Load (lb-ft)	Locked Rotor (%)	Pull Up (%)	Break Down (%)			
100	1.34	36.2	200	180	250			

Design Values



Customer		wk ² Load Inertia (lb-ft ²)	-
Customer PO		Load Type	-
Sales Order		Voltage (%)	100
Project #		Accel. Time	-

Tag:

All characteristics are average expected values.

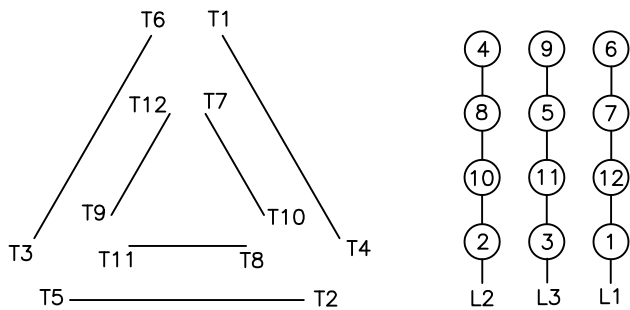
TOSHIBA INTERNATIONAL CORPORATION · HOUSTON, TEXAS U.S.A.

Engineering	jhock	Doc. Written By	D. Suarez	Doc.# / Rev	MPCF-1121/1
Engr. Date	4/9/2014	Doc. Approved By	M. Campbell	Doc. Issued	9/20/2019

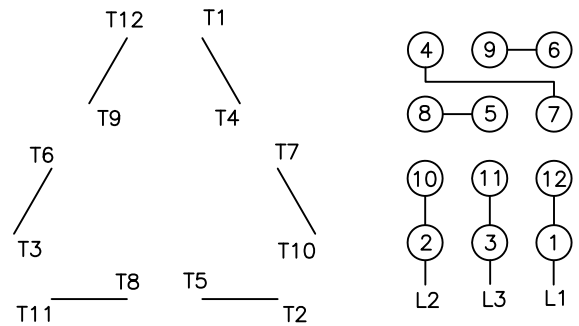
Motor Connection Diagrams
12 Leads

Across-the-Line Starting / Running Connections

Low Voltage Delta



High Voltage Delta



Switch L1 and L2 to reverse rotation

Suitable for Wye-Delta Starting and Limited Part-Winding-Starting.
Please Contact Toshiba International for specific connections.



PERMA-SHIELD® PL SERIES 431

PRODUCT PROFILE

GENERIC DESCRIPTION	Modified Polyamine Ceramic Epoxy
COMMON USAGE	A 100% solids, abrasion-resistant lining specifically designed for wastewater immersion and fume environments and exposure to corrosive soils. Provides low permeation to H ₂ S gas, protects against MIC and provides chemical resistance to steel, ductile iron pipe and fittings for severe wastewater or buried exposures. A coal-tar free, resin-rich formulation with low pigment volume concentration (PVC) for maximum performance.
COLORS	5024 Sewer Pipe Green. Note: Epoxies chalk with extended exposure to sunlight.
FINISH	Gloss
SPECIAL QUALIFICATIONS	Contains 20% ceramic microspheres for increased abrasion resistance. Compatible with high-velocity jet sewer cleaning (hydrocleaning) with 0-degree tips (Reference Technical Bulletin No. 11-86). Meets the performance requirements of AWWA C 210 (not for potable water contact).

COATING SYSTEM

PRIMERS	Self-priming, Series N69 or Series N140. Note: Series 431 must be applied to Series N69 or N140 within 7 days. Scarify the surface with fine abrasive before topcoating if exceeding this maximum recoat window.
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SURFACE PREPARATION

STEEL	Prepare surfaces by method suitable for exposure and service. Wastewater Service: SSPC-SP5/NACE 1 White Metal Blast Cleaning or ISO Sa 3 Blast Cleaning to Visually Clean Steel with a minimum angular anchor profile of 3.0 mil (76.2 microns). Raw water or Buried Service: SSPC-SP10/NACE 2 Near-White Blast Cleaning or ISO Sa 2 1/2 Very Thorough Blast Cleaning with a minimum angular anchor profile of 3.0 mils (76.2 microns).
DUCTILE IRON	All surfaces of ductile iron pipe and fittings shall be delivered to the application facility free of asphalt or any other protective lining on the interior surface. All oils, small deposits of asphalt paint, grease, and soluble deposits shall be removed in accordance with NAPF 500-03-01 Solvent Cleaning prior to abrasive blasting. Pipe Interior: Uniformly rotary-abrasive blast using angular abrasive to a NAPF 500-03-04: Internal Pipe Surface condition, full removal of annealing oxide layer. When viewed without magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating and other foreign matter. Random staining shall be limited to no more than 5 percent and may consist of light shadows, rust stains, oxide stains, or stains of previously applied coating. Any area where rust reappears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns) (Reference NACE RP0287 or ASTM D 4417, Method C). Pipe Exterior: Uniformly abrasive blast the entire surface using angular abrasive to an NAPF 500-03-04: External Pipe Surface Condition. When viewed without magnification, the exterior surfaces shall be free of all visible dirt, dust, loose annealing oxide, mold coating, rust and other foreign matter. Tightly adherent annealing oxide and rust staining may remain on the surface provided they cannot be removed by lifting with a dully putty knife. Any area where rust reappears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns). The exterior surfaces shall be primed with recommended epoxy primer at 3-5 mils (76.2 to 127 microns) dry film thickness. Fittings: Uniformly abrasive blast using angular abrasive to a NAPF 500-03-05: Fitting Blast Clean #1 condition, no staining. When viewed without magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating and other foreign matter. Any area where rust reappears before application shall be reblasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns) (Reference NACE RP0287 or ASTM D 4417, Method C).
ALL SURFACES	Must be clean, dry and free of oil, grease and other contaminants.

TECHNICAL DATA

VOLUME SOLIDS	100% (mixed)
RECOMMENDED DFT	Carbon Steel: 30.0 to 50.0 mils (762 to 1270 microns) in one or more coats. Ductile Iron: 40 mils (1015 microns) (nominal) in one or more coats. Note: Number of coats and thickness requirements will vary with substrate, application method and exposure. Use Series 44-721 to increase film build. Amounts vary by kit size, refer to the Series 44-721 product data sheet. Contact your Tnemec representative for more information.

CURING TIME	Temperature	Set to Touch	Max. Recoat	To Place in Service
	90°F (32°C)	1-2 hours	7 days	24 hours
	75°F (24°C)	2-3 hours	7 days	2 days
	55°F (13°C)	8-9 hours	7 days	3 days

Note: If more than 7 days have elapsed between coats, the Series 431 coated surface must be mechanically abraded (scarified) before topcoating. Curing time will vary with surface temperature, air movement, humidity and film thickness.

VOLATILE ORGANIC COMPOUNDS	EPA Method 24: 0.19 lbs/gallon (23 grams/litre)
HAPS	0.00 lbs/gal solids
THEORETICAL COVERAGE	1,604 mil sq ft/gal (39.4 m ² /L at 25 microns). See APPLICATION section for coverage rates.
NUMBER OF COMPONENTS	Two: Part A (amine) and Part B (epoxy)
MIXING RATIO	By volume: One (Part A) to one (Part B)