WEAVER CONSTRUCTION MANAGEMENT, INC.
3679 S. Huron St., Suite 404
Englewood, CO 80110
Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITAL

January 30, 2012
Submittal No: 11312-002

PROJECT: **Harold Thompson Regional WRF**
Birdsall Rd.
Fountain, CO 80817
Job No. 2908

ENGINEER: **GMS, Inc.**
611 No. Weber St., #300
Colorado Springs, CO 80903
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan Sewage Disposal District**
901 S. Santa Fe Ave.
Fountain, CO 80817
719-382-5303 James Heckman

CONTRACTOR: **Ambiente H2O Inc**.
1500 W Hampden Ave., STE 5D
Sheridan, CO 80110
303-433-0364 Jane Harlow/ Bill Pinkston

SUBJECT: Three (3) WAS End Suction Pumps: 2" B5441 and WCM comments page

SPEC SECTION: 11312: End Suction Centrifugal Pumps

PREVIOUS SUBMISSION DATES:

DEVIATIONS FROM SPEC: ___ YES _X_ NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver General Construction and approved with respect to the means, methods, techniques, & safety precautions & programs incidental thereto. Weaver General Construction also warrants that this submittal complies with contracted documents and comprises on deviations thereto:

Contractor's Stamp:	Engineer's Stamp:
Date: 1/30/12 Reviewed by: Chuck Berry (X) Reviewed Without Comments ( ) Reviewed With Comments	

ENGINEER'S COMMENTS:_____

Project: HDTWRF

Location: Fountain, CO

Supplier: Ambiente H2O Inc.

Date: 1/27/12

Submittal No: 11312-001 and 11312-002

WCM Submittal Review Comments:

1. **Per Spec paragraph 1.3, B., 4., b., the pump type is not indicated.**
2. **Per Spec paragraph 1.3, B., 4., j. and k., submittal page TD5440 indicates basic pump weight. Is that including or excluding frame and pedestal?**
3. **Per Spec paragraph 1.3, B., 4., l., 1), the number of curves submitted is less than specified.**
4. **Per Spec paragraph 1.3, B., 6., l, suitability for use with FVDs is not indicated for motors.**

11312-002
NAS End Suction Pumps

Fairbanks Morse
Pentair Water

Last printed 12/19/2011 11:00:00 AM

December 19, 2011

Ambiente H2O Inc.
1500 W Hampden Ave
STE 5D
Sheridan, CO 80110

Attn: Jane Harlow

Subject:	Purchase Order Number:	P110236-REV1
	Fairbanks Morse Project Number:	095078
	Project:	Harold D. Thompson Regional WRF Denver, Colorado

To Whom It May Concern:

Submittal data for the above order is attached. This submittal is for your review and approval prior to release for manufacturing.

We require submittal return with your review comments and/or approval to release within 35 days for production scheduling purposes. At time of release, please advise firm "on-site" requirement dates for this equipment.

Very Truly Yours,

Specifications Department
Pentair Pump Group

Return Submittal to: **Carolyn Crews**
Supervisor, Order Administration

cc: Selby

Enclosures: (1) sets submittal

3601 Fairbanks Ave. • P.O. Box 6999 • Kansas City, Kansas 66106-0999
913-371-5000 • Fax: 913-371-2272

Fairbanks Morse Pump Corporation
General Clarifications

1. The supply and installation of the following items are by others unless otherwise identified in this submittal.
   - Anchor bolts, nuts and washers
   - Gauges, valves and miscellaneous fittings and adapters.
   - Connecting piping and/or supports
   - Maintenance lubrication piping and related equipment.
   - System control apparatus
   - Maintenance tools and/or storage boxes.
   - Equipment tags.
   - Installation or field performance testing.
2. The following information is required by Fairbanks Morse prior to or at release of the pumps to production.
   - Verification of rotation and discharge position.
3. The following items are shipped loose for installation in the field:
   - Drivers and couplings

Fairbanks Morse Pump
Submittal Data For
Harold D. Thompson Regional WRF
Denver, Colorado

Supplier:	Ambiente H2O Inc.
Manufacturer:	
Pump	Fairbanks Morse Pump 3601 Fairbanks Ave. Kansas City, Kansas 66106-0906 (913) 371-5000 Fax: (913) 371-2272
Order Number:	095078
Quantity:	3
Pump Size & Model:	2" B5441
Coupling:	Falk Corporation 3001 West Canal St. Milwaukee, WI 53208-4222 (414) 342-3131 Fax: (414) 937-4359
Motor:	U S Electrical Motors P. O. Box 3946 St. Louis, MO 63136 (314) 553-2000

Fairbanks Morse Pump
Table of Contents

- **Customer to Advise Rotation and Discharge Position**
- Dynamic Balance Cast Iron Impeller
- 300-350 BHN 416 Stainless Steel Wear Rings
- Stainless Steel Impeller Fastener
- 2 x 2 Suction Elbow
- Vertical Base
- 300-350 BHN Stainless Steel Shaft Sleeve
- Chesterton 255 Mechanical Seal
- Variable Speed High Ring Base
- Falk T10 Steelflex Coupling
- Variable Speed Operation
- Certified Non-Witness Performance Test
- Certified Non-Witness Hydrostatic Test
- Lot of Spare Parts
- 3 HP, 1800 RPM, 3/60/230-460 V Motor

1. Refer also to clarifications that may be included on the vendor submittal.

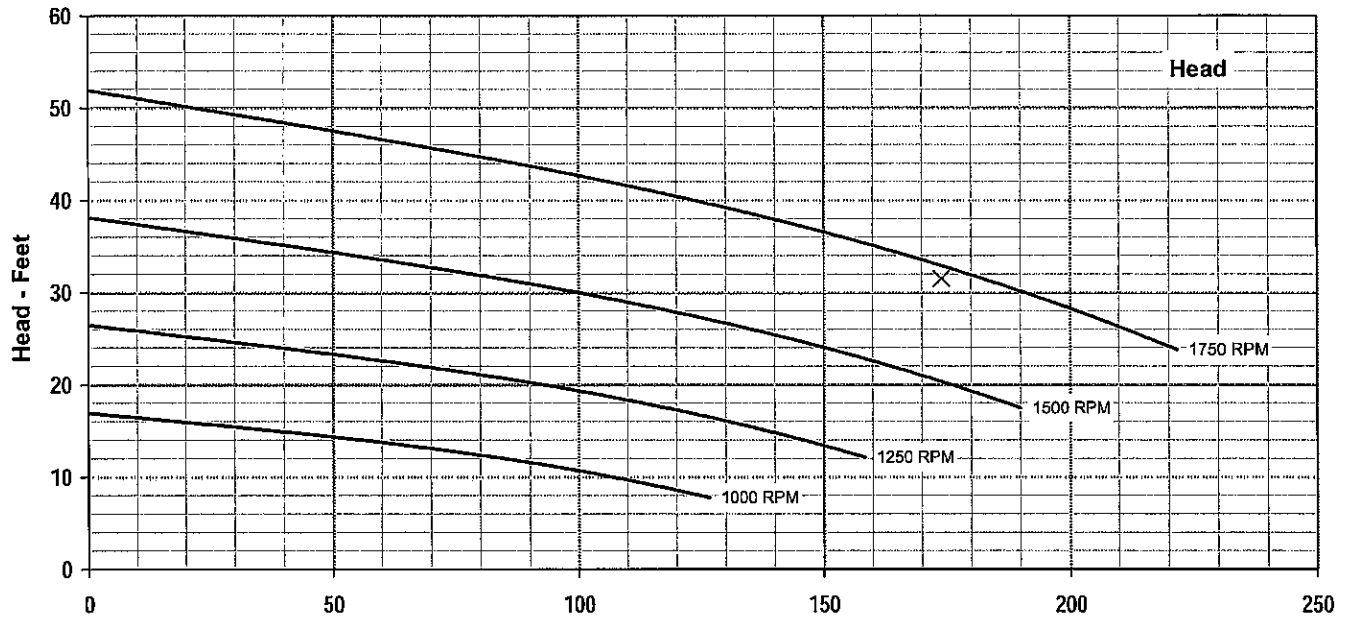
Fairbanks Morse
Pentair Water

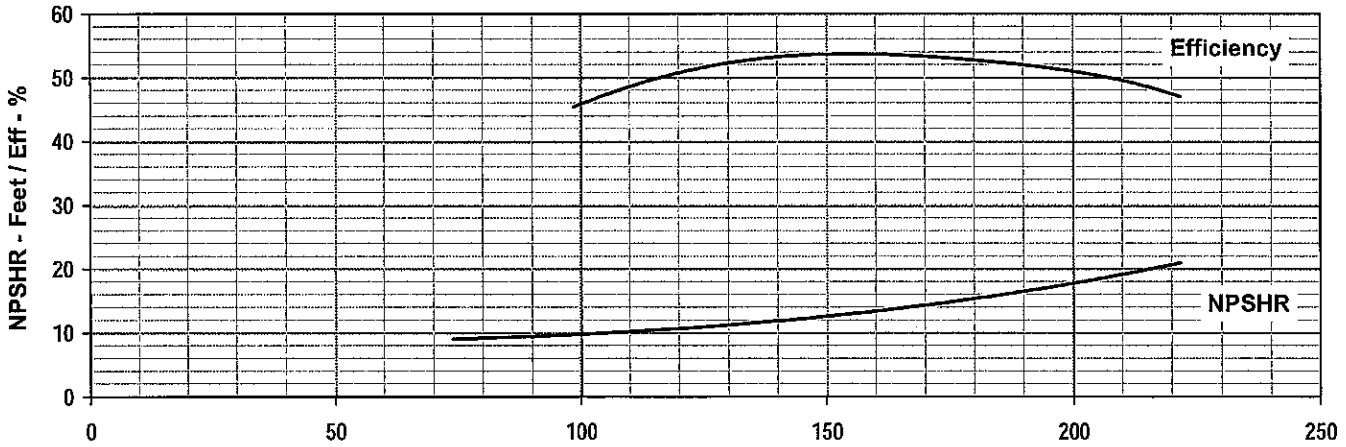
2" B5441 T20 Submittal Curve

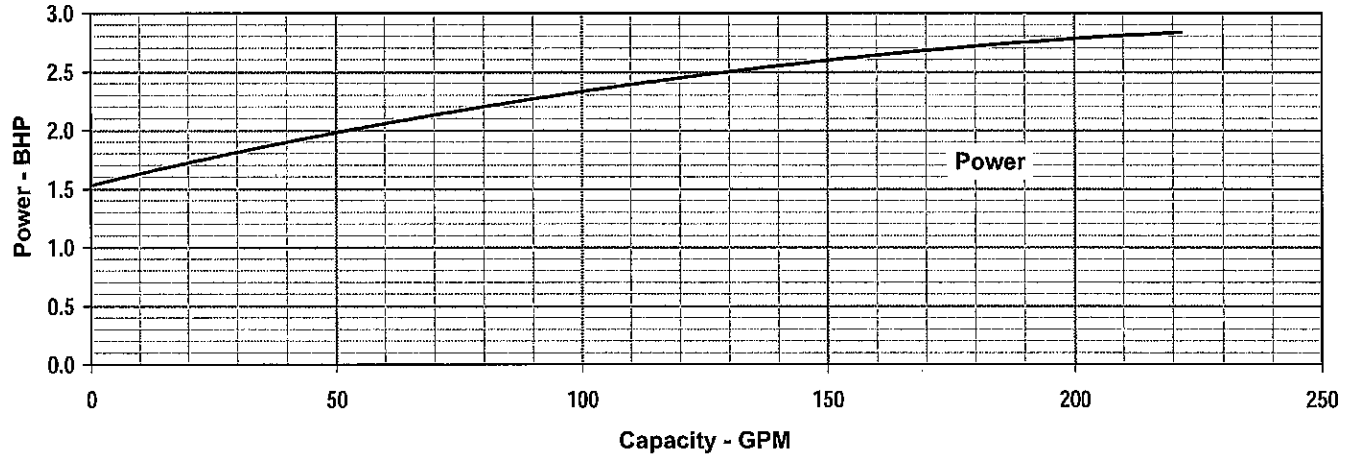
SPEED	IMPELLER	DIAMETER	STAGE	GUARANTEED VALUES			
1750 RPM	T2A1A	6.90"	1	FLOW	HEAD	% EFF	BHP
SPHERE	DRIVER	DATE	BY	174	31.5		
1.5"	3 HP	12/9/2011	KWS				

CURVE NO.:	095078CR0	REV.:	-

THIS CURVE IS BASED ON THE ACTUAL TEST PERFORMANCE OF A SIMILAR PUMP. ONLY THE INDICATED POINT(S) IS GUARANTEED.







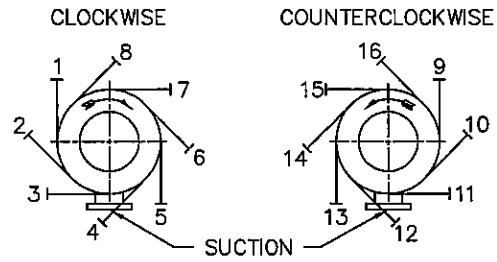
⚠ WARNING

DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARD IN PLACE. ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARD CAN RESULT IN SEVERE BODILY INJURY.

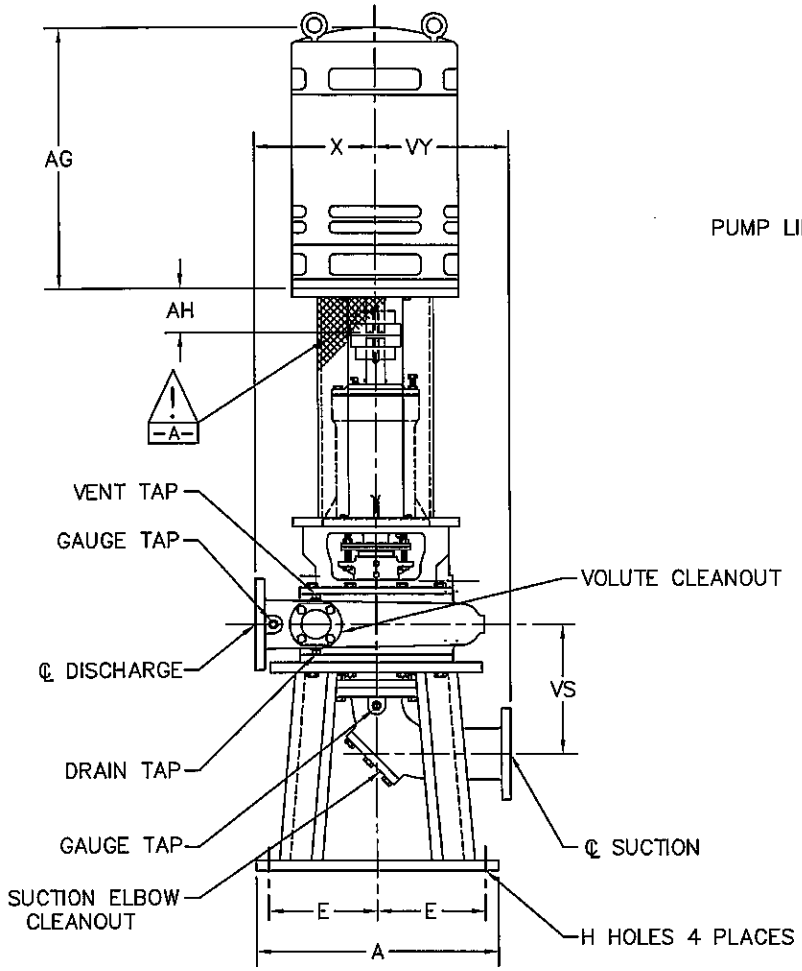
–A– SUPPLIED BY FMPC –B– SUPPLIED BY OTHERS

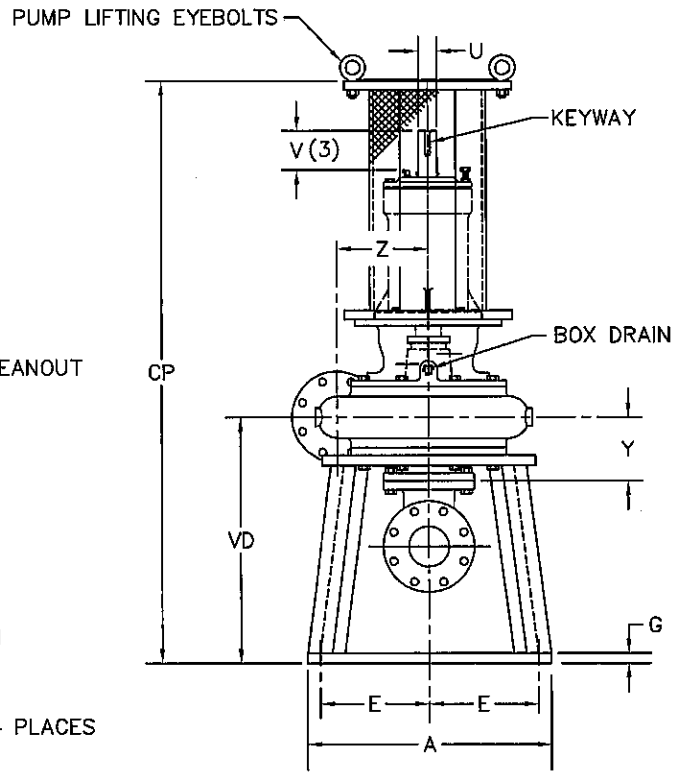
MOTOR DIMENSION	
AG	AH
19.44	2.75

AVAILABLE DISCHARGE POSITIONS



POSITIONS #1 OR #9 ARE STANDARD WHEN VIEWED FROM THE DRIVER END UNLESS OTHERWISE SPECIFIED. CLOCKWISE ROTATION DISCHARGE POSITION #1 SHOWN.





PUMP	FRAME	SUCT	DISCH	A	E	G	H	U	V	X	Y	Z	CP AH=2 3/4	CP ~~AH=4 1/2~~	VD	VS	VY	KEYWAY
2" B5441	T20	2	2	20	8 1/4	1/2	1 1/8	1 3/8	2 1/4	6 1/2	4	5 1/4	43 7/16	~~45 3/16~~	18	9	4 1/2	5/16 X 5/32 X 2

NOTES:

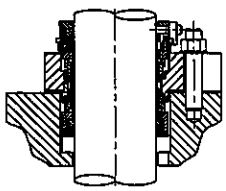
(1) ALL FLANGES ARE 125# ANSI DRILLING UNLESS NOTED.
(2) ALL DIMENSIONS ARE IN INCHES UNLESS NOTED.
(3) DIMENSIONS REFLECT USABLE SHAFT LENGTH.
(4) 5400'S AND 5400K'S ARE DIMENSIONALLY IDENTICAL.
(5) BASES ARE DESIGNED TO HAVE FULL CONTACT WITH GROUT OR A SOLE PLATE GROUTED IN PLACE.
(6) NOT FOR CONSTRUCTION, INSTALLATION, OR APPLICATION PURPOSES UNLESS CERTIFIED. DIMENSIONS SHOWN MAY VARY DUE TO NORMAL MANUFACTURING TOLERANCES.

CUSTOMER: AMBIENTE H2O INC				P.O. NO.: P110236–REV1		Fairbanks Morse PENTAIR PUMP GROUP
JOB NAME: HAROLD D. THOMPSON REGIONAL WRF				TAG NAME:		SETTING PLAN B5441
PUMP SIZE AND MODEL: 2" B5441		GPM: 174	TDH: 31.5	RPM: 1775	ROTATION: **	DISCH POS: **
MOTOR: USEM	HP: 3	FRAME: 182VP	PHASE: 3	HERTZ: 60	VOLTS: 230–460	ENCLOSURE: TEFC
CERTIFIED FOR: PROJECT NO. 095078			CERTIFIED BY: TG		DATE: 12/19/2011	DWG NO: 095078SP REV NO: 0

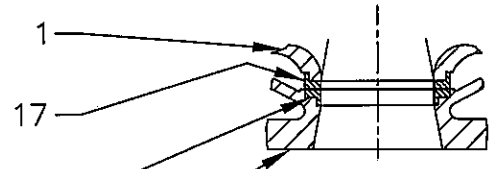
Fairbanks Morse Pump
Material Specifications

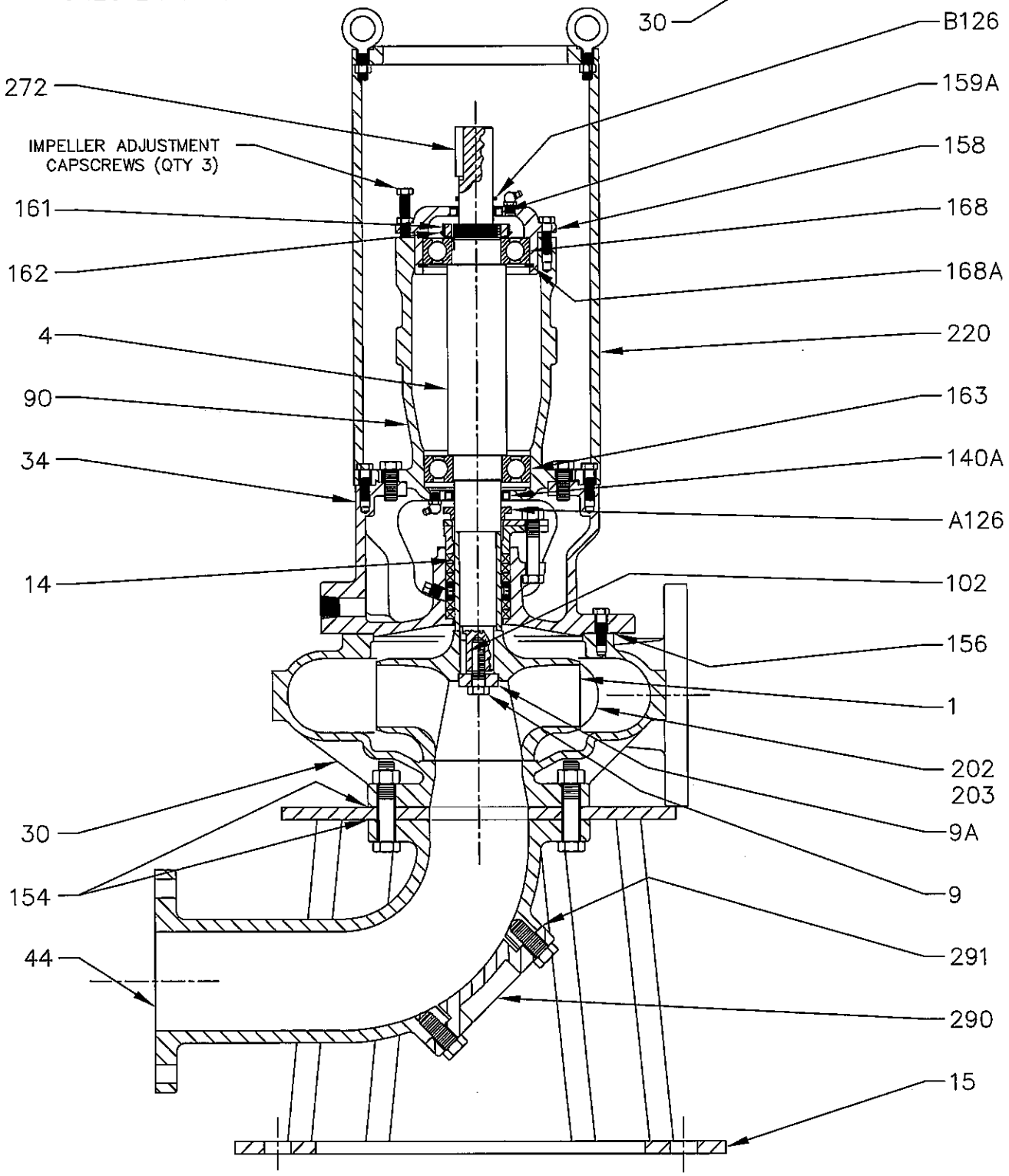
Item	Description	Material	Specification[1]
1	Impeller	Cast Iron	A48 Class 30
4	Shaft	Steel	AISI 4140 or AISI 1144[2]
9	Bolt, Impeller	Stainless Steel	A193 CL2 B8
9A	Washer, Impeller	Stainless Steel	A582 S41600
14	Sleeve, Shaft	Stainless Steel	A743 CA40 300-350 BHN
15	Base	Cast Iron	A48 Class 30
16	Wear Ring, Fronthead	Stainless Steel	A743 Gr. CA40 300-350 BHN
17	Wear Ring, Impeller	Stainless Steel	A743 Gr. CA40 300-350 BHN
30	Volute	Cast Iron	A48 Class 30
33	Fronthead	Cast Iron	A48 Class 30
34	Backhead	Cast Iron	A48 Class 30
44	Suction Elbow	Cast Iron	A48 Class 30
90	Frame	Cast Iron	A48 Class 30
A126	Deflector, Inner	Rubber	Commercial
B126	Deflector, Outer	Rubber	Commercial
102	Key, Impeller	Stainless Steel	A276 S30400
140A	Seal, Outer Grease	Steel & Rubber	Commercial
154	Gasket, Elbow	Tag Board	F104
156	Gasket, Volute	Tag Board	D1170-G3111
158	Housing, Thrust Bearing	Cast Iron	A48 Class 30
158A	Lip Seal	Steel & Rubber	Commercial
159A	Seal, Outer Grease	Steel & Rubber	Commercial
161	Locknut, Bearing	Steel	SAE Bolt Steel
162	Lockwasher, Bearing	Steel	AISI 1215
163	Bearing, Radial	Steel	Commercial
168	Bearing, Thrust	Steel	Commercial
168A	Snap Ring, Bearing	Steel	Commercial
202	Cover, Volute Cleanout	Cast Iron	A48 Class 30
203	Gasket, Cleanout	Rubber	Commercial
220	High Ring Base	Cast Iron/Steel	A48 Class 30 /A36 & A53
272	Key, Coupling	Steel	A108 Grade 1018
290	Cover, Suction Hand hole	Cast Iron	A48 Class 30
291	Gasket, Handhole	Rubber	Commercial
456	Mechanical Seal	Commercial	Commercial

[1] All material specifications are ASTM unless otherwise noted and are or description of chemistry only.
[2] Manufacturer's option.
[4] All dimensions are in inches unless otherwise noted.



CHESTERTON 255





ASSEMBLY WITH INTEGRAL FRONTHEAD
B5441 T20 FRAME

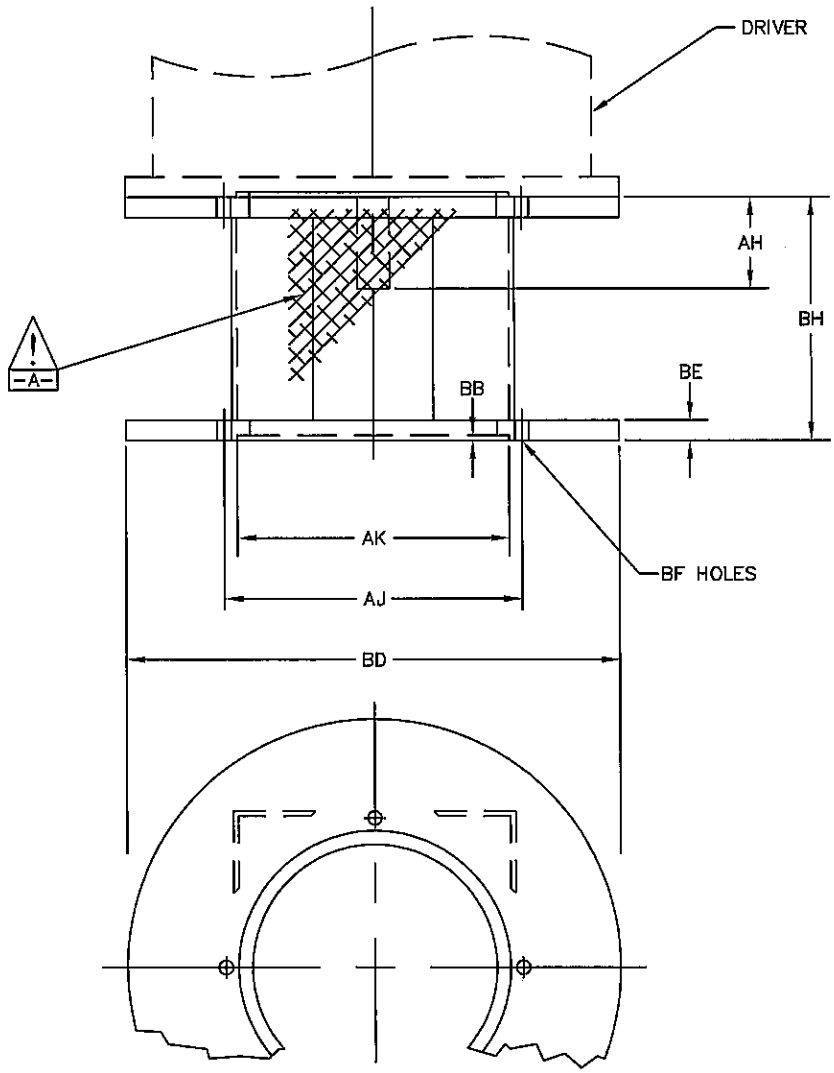
Fairbanks Morse
PENTAIR PUMP GROUP

DWG NO 5440A001 REV NO 0

WARNING

DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARD IN PLACE. ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARD CAN RESULT IN SEVERE BODILY INJURY.

–A– SUPPLIED BY FMPC –B– SUPPLIED BY OTHERS



FLANGE SIZE	STANDARD HIGH RING BASE							
	BH	AJ	AK	BB	BD	BE	BF HOLES	AH
10	9	9 1/8	8 1/4	3/16	10	3/4	7/16	2.75

HIGH RING BASE DIMENSIONS FOR "P" FLANGE DRIVERS

Fairbanks Morse
PENTAIR PUMP GROUP

DWG NO 5410S017 REV NO 0

Pump[4]	
Frame Size	T20
Pump Size	2
Suction Size, Standard	2
Nominal Wear Ring Clearance	0.015
Impeller Fastener	
Size	1/2-13
Tightening Torque, lb.-ft.	80
Impeller	
Weight, lb.	17.8
Inlet Area, sq. In	9.28
WK^2 Lb.-Ft.^{2}	0.6
Sphere Size, Maximum	1 1/2
Shaft Diameter:	
at Impeller	1 1/4
at Sleeve	1 1/2
at Thrust Bearing	1.969
at Radial Bearing	1.969
Between Bearings	2 3/8
at Coupling	1 3/8
Keyway at Coupling	5/16 X 5/32
Torsional Shaft Stiffness, lbs./rad.	$3.7X10^5$
Center to Center of Bearings	8 3/4
Thrust Bearing Number	6310
Radial Bearing Number	6310
Sealing Box:	
Mechanical Seal	
Type	Chesterton 255
Recommended Flush Water	
Pressure, PSI (above operating pressure)	1-10
Flow, GPM	1/2-1
Sleeve OD	1 7/8
Box ID	2 5/8
Box Depth	2 7/8
Box Inlet Tap Size, NPT	1/4
Box Outlet Tap Size, NPT	1/4
Backhead Drain Tap Size, NPT	3/4
Volute Cleanout Diameter	N/A
Suction Elbow Cleanout Diameter	2
Vent/Priming Tap Size, NPT	1/4
Gauge Tap Size	
Suction, NPT	1/2
Discharge, NPT	1/2
Hydrostatic Test Pressure, Maximum, PSI	65
Casing Working Pressure, Maximum, PSI	45
Nominal Casing Thickness	5/16
Operating Temperature, °F	150
Anchor Bolt Size Recommended	7/8
Minimum Diameter Opening to Install Pump	28
Shipping Weight, Basic Pump, lb	300

Fairbanks Morse Pump
Typical Pump Bearing Lubricants

Fairbanks Morse Pump recommends a superior quality, NLGI No. 2, multipurpose, lithium complex grease for all pump rolling element bearing applications that require grease lubrication. The grease characteristics should include good high temperature performance, extreme pressure properties, water resistance, excellent oxidation stability, good rust protection and resistance to chemical breakdown. Fairbanks Morse Pump does not recommend grease with molybdenum disulfide (moly) additives. In addition to the characteristics listed above, the grease should meet the following specification.

Specifications

Consistency:	NLGI No. 2	
Dropping Point	ASTM D2265	>450° F
Base fluid viscosity		
SUS @ 100° F	700 to 1200	
SUS @ 212° F	70 to 100	
Rust Prevention	ASTM 1743	Pass
Water Washout	ASTM 1264	<4% @ 175° F
Four Ball EP Test	ASTM D2596	>40kg load wear
		>250kg weld point

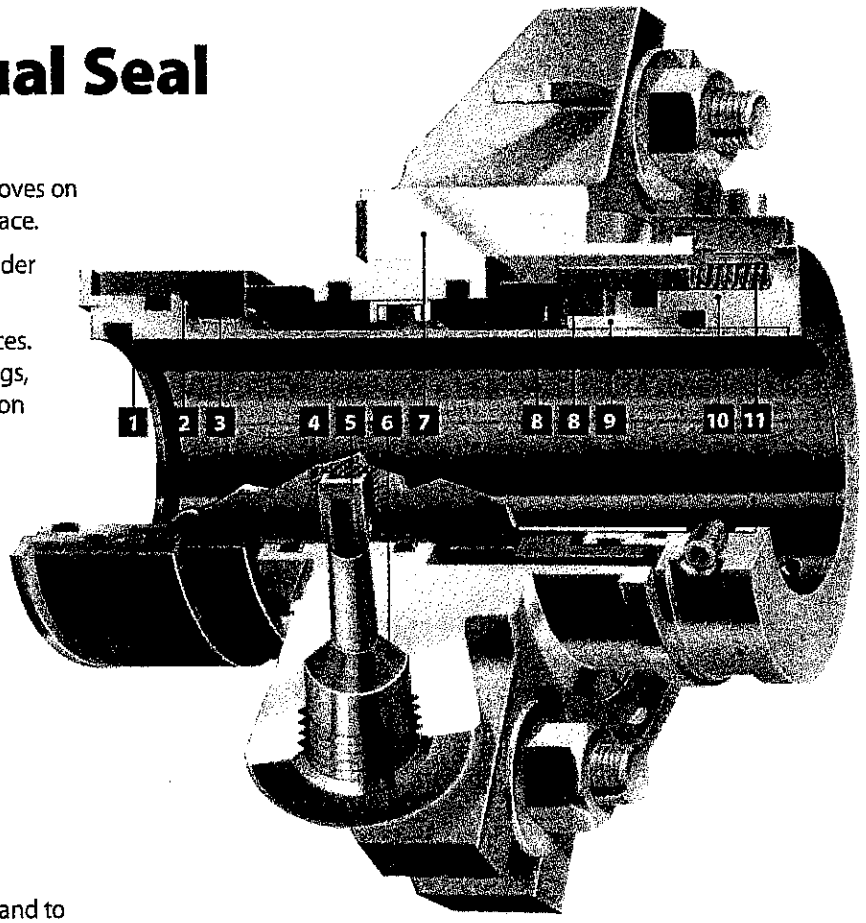
Fairbanks Morse Pump has compiled a general list of products that meet the grease requirements above. This list is not an endorsement of any particular manufacture and should not be construed as exclusive recommendations. When choosing an alternate manufacture, customers should discuss this typical lubricant recommendation with their vendor to ensure that equivalent grease is supplied.

Typical Products

Manufacturer	Lubricant Brand Name	NLGI No.
BP	BP Energrease® LC EP 2	2
Castrol	Pyroplex Red	2
Chevron	Delo® Greases EP	2
Exxon	Ronex® MP	2
Mobil	Mobiltith® AW2	2
Shell	Retinax® LC	2
Texaco	Starplex® 2	2
76	76 Multiplex EP	2

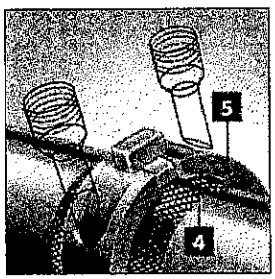
CHESTERTON®

255™ Cartridge Dual Seal



Construction Details

1. Every O-ring is either static or moves on a non-fretting, non-metallic surface.
2. Precision seal ring support shoulder maintains rotary alignment.
3. Inboard rotary and stationary faces. Dynamic stress-relieving seal rings, mated over a narrow cross-section for low heat generation.



4. Profiled sleeve provides positive pumping of barrier fluid.
5. Patented shuttle slides within gland to decouple faces from gland misalignment, channel barrier fluid, and provide anti-rotation for stationary seal rings.
6. Barrier fluid ports provide high capacity cooling.
7. Universal gland fits majority of pumps. ANSI oversize and API glands available.
8. Outboard stationary and rotary faces, identical to inboard set for simple assembly, low replacement inventory.
9. Inboard and outboard integral drive pads cannot loosen or fall out.
10. Patented Self-Centering Lock Ring™ for superior concentricity.
11. Revolutionary Unified Seal Alignment™ requires only one set of springs to provide constant loading of all four faces. Springs are isolated from process and barrier fluids.

Built for the future of emissions control
The Chesterton 255 seal is designed to meet environmental regulations for emissions control.

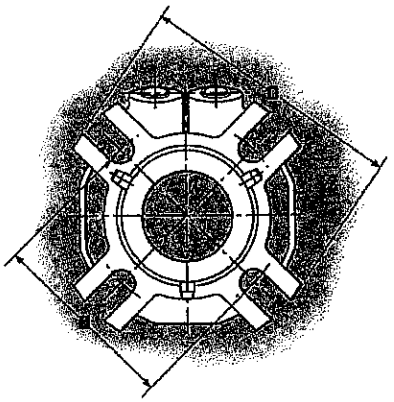
Advanced technology for applications flexibility
The exclusive design of the 255 enables it to operate in double-mode (barrier fluid pressure higher than stuffing box pressure) or tandem-mode (barrier fluid pressure lower than stuffing box pressure).

Staying cool in operation and under pressure
The 255 handles 50% to 100% more pressure than typical seals, providing users with a "margin of safety" at start-up and shut-down when transient surges often occur. The 255 features an internal positive barrier fluid pumping system with wide flow channels for efficient removal of heat. To test the 255's cool running, the 255 and a widely used competitive double seal were run under identical conditions with repeated shutoffs. ***Test conditions:*** 1.875" (48 mm) shaft, water barrier fluid room temperature, 1750 RPM, closed convection system. ***Results:*** 255 ran cool and steady while the conventional seal overheated and flashed.

CHESTERTON®

255 STANDARD – Dimensional Data/Inch

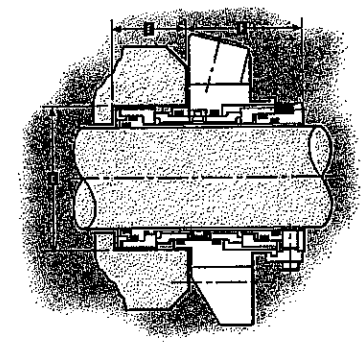
SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE		
	B MAX	C MIN	C MAX	E MIN	F	3/8"	G/MIN 1/2"	5/8"
1.000	4.12	1.75	1.81	1.36	2.16	2.81	2.94	–
1.125	4.12	1.88	1.94	1.36	2.16	2.95	3.08	–
1.250	4.12	2.00	2.06	1.36	2.16	3.08	3.21	–
1.375	4.37	2.13	2.81	1.36	2.16	3.21	3.34	–
1.500	4.50	2.25	2.44	1.36	2.16	3.33	3.46	–
1.625	5.00	2.38	2.56	1.36	2.16	3.45	3.58	–
1.750	5.50	2.50	2.81	1.36	2.16	3.66	3.79	–
1.875	5.50	2.63	2.94	1.36	2.16	3.78	3.91	–
2.000	5.50	2.75	3.19	1.36	2.16	4.03	4.16	–
2.125	6.01	2.88	3.44	1.36	2.16	4.29	4.42	4.54
2.250	6.01	3.00	3.56	1.36	2.16	4.41	4.54	4.66
2.375	6.01	3.13	3.69	1.36	2.16	4.44	4.57	4.69
2.500	6.51	3.25	3.81	1.36	2.16	4.66	4.79	4.91



255 – Standard Version

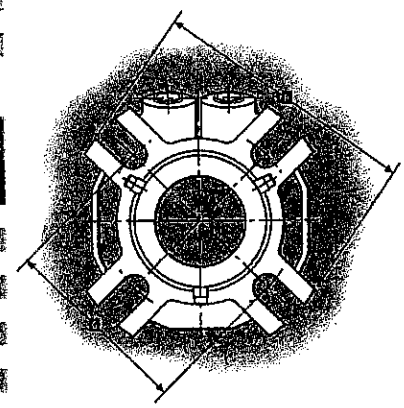
255 STANDARD – Dimensional Data/Metric

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE		
	B MAX	C MIN	C MAX	E MIN	F	8 mm	G/MIN 10 mm	12 mm
25	105	44	46	35	55	70	72	74
28	105	47	49	35	55	73	75	77
30	105	49	51	35	55	76	78	80
32	105	51	52	35	55	77	79	81
33	114	54	58	35	55	78	80	82
35	114	54	59	35	55	80	82	84
38	114	57	62	35	55	83	85	87
40	127	59	61	35	55	86	88	90
43	127	64	69	35	55	89	91	93
45	140	64	66	35	55	93	95	97
48	140	69	74	35	55	94	96	98
50	140	69	71	35	55	98	100	102
55	153	74	76	35	55	–	103	105
60	153	79	85	35	55	–	113	115

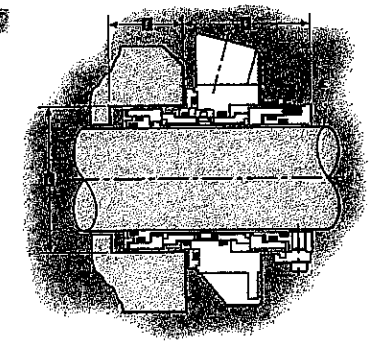


255 ADAPTER VERSION – Dimensional Data/Inch

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE		
	B MAX	C MIN	C MAX	E MIN	F	3/8"	G/MIN 1/2"	5/8"
1.000	4.12	1.75	1.81	1.18	2.35	2.81	2.94	–
1.125	4.12	1.88	1.94	1.18	2.35	2.95	3.08	–
1.250	4.12	2.00	2.06	1.18	2.35	3.08	3.21	–
1.375	4.37	2.13	2.81	1.18	2.35	3.21	3.34	–
1.500	4.50	2.25	2.44	1.18	2.35	3.33	3.46	–
1.625	5.00	2.38	2.56	1.18	2.35	3.45	3.58	–
1.750	5.50	2.50	2.81	1.18	2.35	3.66	3.79	–
1.875	5.50	2.63	2.94	1.18	2.35	3.78	3.91	–
2.000	5.50	2.75	3.19	1.18	2.35	4.03	4.16	–
2.125	6.01	2.88	3.44	1.18	2.35	4.29	4.42	4.55
2.250	6.01	3.00	3.56	1.18	2.35	4.41	4.54	4.67
2.375	6.01	3.13	3.69	1.18	2.35	4.44	4.57	4.70
2.500	6.51	3.25	3.81	1.18	2.35	4.66	4.79	4.92

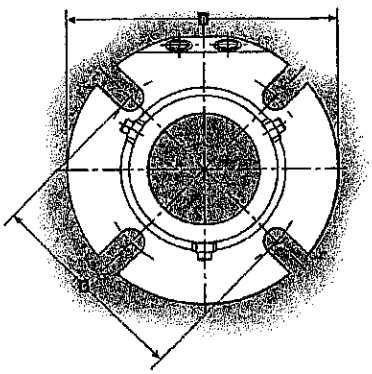


255 – Adapter Version



255 LARGE – Dimensional Data/Inch

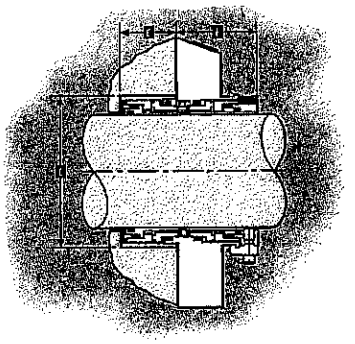
SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE		
	B MAX	C MIN	C MAX	E MIN	F	3/8"	G/MIN 1/2"	5/8"
2.625	6.45	3.63	3.69	1.64	2.52	5.02	5.15	–
2.750	7.71	3.75	4.19	1.64	2.52	5.42	5.55	–
2.875	7.83	3.88	4.32	1.64	2.52	5.50	5.63	–
3.000	7.94	4.00	4.44	1.64	2.52	5.65	5.78	–
3.125	7.99	4.13	4.57	1.64	2.52	5.80	5.93	–
3.250	8.19	4.25	4.69	1.64	2.52	5.93	6.06	–
3.375	8.31	4.38	4.82	1.64	2.52	6.00	6.13	6.26
3.500	8.44	4.50	4.94	1.64	2.52	6.16	6.29	6.42
3.625	8.49	4.63	5.07	1.64	2.52	6.29	6.42	6.55
3.750	8.72	4.75	5.19	1.64	2.52	6.36	6.49	6.62
3.875	8.84	4.88	5.32	1.64	2.52	6.50	6.63	6.76
4.000	8.96	5.00	5.44	1.64	2.52	6.64	6.77	6.90
4.125	8.99	5.13	5.57	1.64	2.52	6.76	6.89	7.02
4.250	8.99	5.25	5.69	1.64	2.52	6.89	7.02	7.15
4.375	9.34	5.38	5.82	1.64	2.52	7.01	7.14	7.27
4.500	9.49	5.50	5.94	1.64	2.52	7.16	7.29	7.42
4.625	9.49	5.63	6.07	1.64	2.52	7.26	7.39	7.52
4.750	10.49	5.75	6.19	1.64	2.52	7.38	7.51	7.64



255 – Large Version

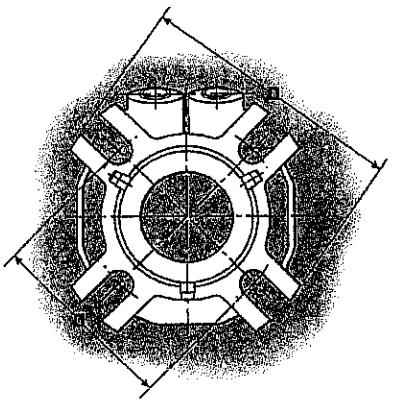
255 LARGE – Dimensional Data/Metric

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE		
	B MAX	C MIN	C MAX	E MIN	F	12 mm	G/MIN 16 mm	20 mm
65	164	92	93	42	64	127	131	–
70	196	95	105	42	64	137	141	–
75	202	102	112	42	64	143	147	–
80	203	105	115	42	64	147	151	–
85	211	111	121	42	64	152	156	160
90	214	114	124	42	64	156	160	164
95	221	121	131	42	64	161	165	169
100	228	127	137	42	64	168	172	176
110	237	137	147	42	64	177	181	185
120	266	146	156	42	64	187	191	195



255 OVERSIZE – Dimensional Data/Inch

SHAFT SIZE	GLAND OD	STUFFING BOX BORE		SB DEPTH	OB LENGTH	BOLT CIRCLE BY BOLT SIZE		
	B MAX	C MIN	C MAX	E MIN	F	3/8"	G/MIN 1/2"	5/8"
1.125	4.49	2.63	2.94	1.48	1.98	3.77	–	–
1.375	5.40	2.82	2.99	1.48	1.98	4.02	–	–
1.750	6.64	3.51	3.74	1.30	2.16	5.21	5.34	5.46
1.875	5.99	3.57	3.80	1.30	2.16	–	4.94	–
2.125	6.99	3.89	4.24	1.30	2.16	–	–	5.89
2.500	7.72	4.51	4.74	1.30	2.16	–	–	6.70



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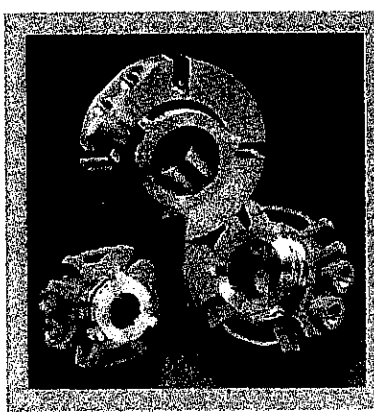


STANDARD MATERIALS**

Rotary Faces:
- Silicon Carbide
- Tungsten Carbide

Stationary Faces:
- Duplex Carbide™
- Carbon
- Silicon Carbide
- Tungsten Carbide

All Metal Parts:
- 316SS

Springs:
- Hastelloy C®

O-Rings:
- Fluorocarbon or AFLAS™
- Installed EPR included

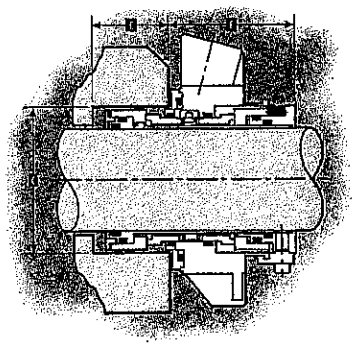
OPERATING LIMITS†

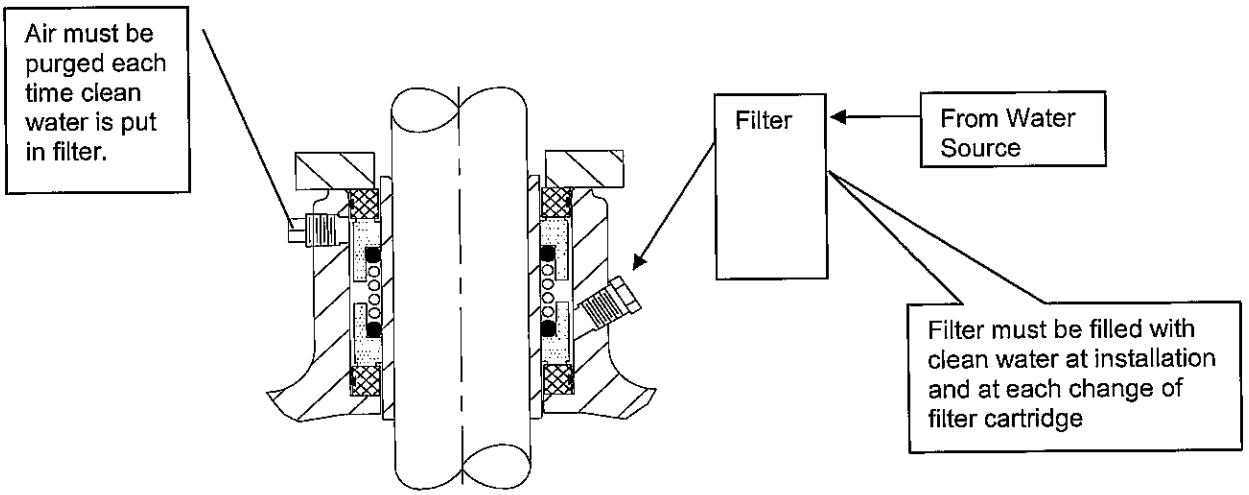
Speed Limits:
- to 4000 rpm (20 mps)

Temperature Limits:
- to 300°F (150°C) Ethylene Propylene
- to 400°F (205°C) Fluorocarbon/AFLAS
- to 500°F (260°C) perfluoroelastomer

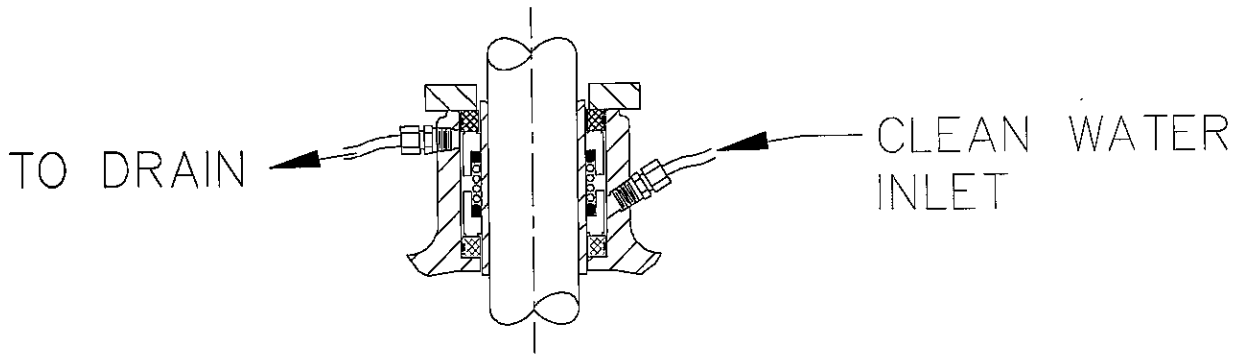
Pressure Limits:
- to 600 PSI (40 bar) inboard
- to 250 PSI (17 bar) outboard

* Haynes International, Inc. Registered Trademark
** Other materials available upon request
† 55S sizes
‡ Asahi Glass Company Ltd. Registered Trademark





Typical Deadhead Schematic



Typical Flush Water Schematic

Fairbanks Morse Pump
Furnished Spare Parts

Ref. No.	Description	Quantity
456	Mechanical Seal	2
16, 17	Set Wear Rings	2
--	Set Bearings	2

Fairbanks Morse Pump
Paint Specifications

• **Coating Manufacturer**	Davis Industrial Coatings
• **Surface Preparation**	Factory Standard.
• **Finish Coat**	Modified Alkyd Enamel
Number of Coats	Factory Standard
Color	Real Blue
Dry Film Thickness	Factory Standard
Surfaces to be coated	Exterior of Pump

P.O. BOX 7589
1311 IRON STREET
KANSAS CITY, MISSOURI 64116
(816) 471-4447

DAVIS INDUSTRIAL COATINGS

HIGH SOLIDS FAST DRY ENAMEL
L/F REAL BLUE
4-3373

DESCRIPTION:
High Solids Fast Dry Enamel is a modified alkyd enamel for general industrial finishing of farm machinery, tanks, electrical equipment, heavy duty equipment and a variety of other products that require a high performance coating. Fast Dry Enamel exhibits excellent color and gloss retention, flexibility, hardness and corrosion resistance.

Weight Gallon:	9.92 ± 0.2 lb/gal
Weight Solids:	64.8 ± 2%
Volume Solids:	50.8 ± 2%
Coverage:	
@ 1 Dry Mil:	814 sq. ft./gallon
@ Spread Rate:	400 sq. ft./gallon (4.0 mils wet) Deposits a 2.0 mil dry film
VOC:	418 g/l; 3.49 lb/gal
Viscosity:	40-50" #4 Ford Cup @ 77°F
Gloss @ 60:	90+
Grind (Hegman):	#7
DOT Class:	Flammable, Flash Point 45°F, Paint UN1263
Federal Specification:	N/A
HMIS/NFPA:	2,3,0
Cure Time (Based on 70° F. & 50% R.H.):	
To Touch:	30 minutes
To Recoat:	0-1 hours, or after 96 hours
Recommended Thinner:	Butyl acetate for cleanup and reduction to spray
Temperature Resistance:	Continuous 150° F., Intermittent 200° F.

WARNING! FLAMMABLE! FOR INDUSTRIAL USE ONLY! Keep away from heat and open flame. Avoid prolonged contact with skin and breathing of vapor or spray mist. Do not take internally. Close container after each use. Use only with adequate ventilation. Use respiratory devices and other personal protective equipment required by OSHA 29CFR 1910. KEEP OUT OF REACH OF CHILDREN. For specific safety requirements, refer to the Material Safety Data Sheet.

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DAVIS INDUSTRIAL COATINGS

HIGH SOLIDS FAST DRY ENAMEL

DESCRIPTION:

High Solids Fast Dry Enamel is a modified alkyd enamel for general industrial finishing of farm machinery, tanks, electrical equipment, heavy duty equipment and a variety of other products that require a high performance coating. Fast Dry Enamel exhibits excellent color and gloss retention, flexibility, hardness and corrosion resistance.

SPECIAL CAUTIONS:

Do not apply Fast Dry Enamel when surface, air or material temperature is below 40°F. Surface must be dry and at least 5°F above the dew point.

SURFACE PREPARATION:

GENERAL - Surfaces to be finished must be clean, dry and free of dirt, oil or any contamination that would adversely affect adhesion, protective properties or appearance of the coating. Abrasive blasting is an effective method of cleaning steel surfaces and removing mill scale, rust and previous coatings. A 2 to 3 mil profile is recommended.

IRON, STEEL AND FERROUS METAL - For optimum adhesion and corrosion resistance, metal should be cleaned and phosphate treated or primed with Davis Fast Dry Metal Primer.

ALUMINUM & GALVANIZED METAL - For optimum adhesion chemically etch or prime with Vinyl Wash Primer.

PREVIOUSLY FINISHED SURFACES - Scaling and peeling paint must be removed by wirebrushing, sanding or scraping. Rusting metal should be cleaned and spot primed with Fast Dry Primer.

MIXING & THINNING:

Stir each container thoroughly prior to use. Material is packaged at a viscosity requiring little or no reduction for application by airless spray equipment. For conventional air spray, air-assist airless, dip or turbo will generally require a 25% reduction (4 parts paint to 1 part solvent by volume) with aromatic solvent.

Solvents of choice are toluol, xylol, SC-100 and SC-150. For cool weather conditions (below 65°F) use toluol. For normal temperatures (65-80°F) use xylol. For temperatures above 80°F, xylol may still be used, but SC-100 or SC-150 can be used as a retarder solvent to reduce dry spray and increase flow and leveling. Limit the level of SC-150 to 5% as a retarder solvent. Never use solvents such as VM&P naphtha, mineral spirits or reclaimed thinner. THIS PRODUCT MAY BE THINNED WITH KETONE, ESTER OR ALCOHOL SOLVENTS THAT ARE SARA TITLE 313 EXEMPT. Addition of solvent will increase VOC.

To store partially used container, pour a small amount of the recommended thinner over the surface. Do not stir. Replace lid securely. Store away from heat or open flame. Mix thoroughly before reusing.

Fast Dry Enamel may also be catalyzed with Davis Urethane Catalyst to create a hard, solvent and chemical resistant finish that is free from "after tack". Mix 16 parts paint to one part Urethane Catalyst (4-9062) by volume. Use within a two hour time period. Due to short potlife, never leave catalyzed paint in spray equipment. Clean immediately! Do not spray catalyzed material with heated spray equipment.

CLEAN UP:

Use xylol, aromatic solvent or MEK for cleaning guns and equipment.

APPLICATION:

Material can be applied by conventional air, air-assist airless, airless, dip or more advanced application equipment such as turbo disk or bell. This product may also be applied with electrostatic and/or heated equipment. Not recommended for brush or roller application over large areas. Small touchup areas may be brushed. Use the following recommendations as an application guide:

CONVENTIONAL AIR SPRAY:

Air Cap	66PF
Fluid Nozzle	63
Needle	63
Air Pressure	50-60 psi
Fluid Pressure	10-20 psi
Viscosity	18-26" #2 Zahn

AIR ASSIST-AIRLESS SPRAY:

Tip	0.009-0.013"
Fluid Pressure	300-600 psi
Air Pressure	10-25 psi
Pump/tip Filter	100 Mesh
Viscosity	20-30" #2 Zahn

AIRLESS SPRAY:

Tip	0.011-0.015"
Fan	50° (10-12 inch fan)
Pressure	1200-1800 psi
Pump/tip Filter	100 Mesh
Viscosity	25-60" #2 Zahn

For dip, flowcoat or turbo application, use the viscosity range 20-35" #2 Zahn as a starting point. On hot spray applications, material it is recommended to stay in the 90-140°F range.

APPLICATION RATE:

In most cases, an application over a primed or phosphated surface will provide adequate durability. Application rate will vary widely depending on texture, configuration and porosity of surfaces on which coating is applied. Approximately 350-400 square feet per gallon on smooth surfaces (32 to 37 square meters per 3.785 liters). Rough or porous surfaces will require more paint.

Approximate dry mil thickness of 1.3 mils at recommended application rate of 400 square feet per gallon on smooth surface. A dry film thickness of 1.0-1.5 mils is recommended

DRYING:

Optimum drying conditions are 60°F to 90°F (16°C to 32°C) at 50% R.H. Lower temperatures and high humidity will slow dry. Surface must be dry and at least 5°F above the dew point.

Dry to Touch	15-30 Minutes
To Recoat	Between 0-1 hours or after 96 hours

Product may also be force cured to enhance dry. Temperatures in the range of 110-180°F may be utilized to accelerate solvent evaporation and speed oxidation.

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MATERIAL SAFETY DATA SHEET

PRODUCT NAME: 4-3373 H/S F/D ENAMEL REAL BLUE HMIS CODES: H F R P
PRODUCT CODE: 000000000000043373 2 3 0

SECTION I - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: DAVIS PAINT COMPANY
ADDRESS : 1311 IRON STREET
P.O. BOX 7589
N. KANSAS CITY, MO 64116
EMERGENCY PHONE : (816)-471-4447 DATE PRINTED : 01/12/96
INFORMATION PHONE : (816)-471-4447 NAME OF PREPARER : Sandy Haskins

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT - CONTACT CHEMTREC PHONE: (800)-424-9300

SECTION II - INGREDIENTS/SARA III INFORMATION

REPORTABLE COMPONENTS	CAS NUMBER	VAPOR PRESSURE mm Hg @ TEMP		WEIGHT PERCENT
METHYL PROPYL KETONE (2-Pentanone)	107-87-9	27.8	68	25% - 30%
OSHA TWA: 200 PPM, ACGIH TLV: 200 PPM, DAVIS(REC): 705 mg/m3				
CALCIUM CARBONATE (Total Dust)	1317-65-3	0	68	25% - 30%
OSHA TWA: 15 mg/m3, ACGIH TLV: 10 mg/m3, DAVIS(REC): 5 mg/m3				
* METHYL ISOBUTYL KETONE (MIBK) (Hexone)	108-10-1	15	68	5
OSHA TWA: 50 PPM, ACGIH TLV: 50 PPM, DAVIS(REC): 205 mg/m3				

* indicates toxic chemical(s) subject to the reporting requirements of section 313 of Title III and of 40 CFR 372.
This material may contain ingredients covered by the California "Safe Drinking Water and Toxic Enforcement Act of 1986".

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING RANGE: 214 deg F - 237 deg F SPECIFIC GRAVITY (H2O=1): 1.19
VAPOR DENSITY: LIGHTER THAN AIR EVAPORATION RATE: SLOWER THAN ETHER
COATING V.O.C.: 3.48 lb/gl, 417 g/l
MATERIAL V.O.C.: 3.48 lb/gl, 417 g/l
SOLUBILITY IN WATER: Negligible
APPEARANCE AND ODOR: Liquid, aromatic odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TCC): 46 deg F
FLAMMABLE LIMITS IN AIR BY VOLUME- LOWER: 1 UPPER: 7.5

EXTINGUISHING MEDIA: FOAM, CO2, DRY CHEMICAL

SPECIAL FIREFIGHTING PROCEDURES

Full protective equipment and self contained breathing apparatus should be used.Water spray may be ineffective. Water may be used to cool closed containers to prevent pressure build-up and possible auto-ignition or explosion from heating.

UNUSUAL FIRE AND EXPLOSION HAZARDS

H s as an ignitable liquid. Keep containers tightly closed and isolate from heat, electrical equipment, sparks or flame. Vapors fc. n explosive mixture in air between the upper and lower explosive limits. Never use welding or cutting torch on or near drum (ev. empty) because product (even just residue) can ignite explosively. Avoid spontaneous combustion of soiled rags, steel wool, spray booth filters, spray residues and other waste material contaminated with this product by immediately immersing them in a sealed, water-filled metal container prior to disposal.

SECTION V - REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID

Excessive heat, all possible sources of ignition, poor ventilation, corrosive atmospheres, excessive aging.

INCOMPATIBILITY (MATERIALS TO AVOID)

Alkaline materials, strong acids and oxidizing materials. If this product is not water reducible, avoid water.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS

Thermal decomposition or combustion can produce fumes containing organic acids, carbon dioxide and carbon monoxide.

HAZARDOUS POLYMERIZATION:

Will not occur under normal conditions

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Solvent vapor or mist can cause dizziness, breathing difficulty, headaches, irritation to nose and throat, loss of coordination. Continued over-exposure can lead to central nervous system depression.

SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Eye Contact: Liquid or vapor can cause irritation, tearing, discomfort, redness and blurred vison. Skin Contact: Can cause irritation. Can cause defatting of skin which can lead to dermatitus.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

can be absorbed through skin causing irritation, defatting and dermatitus.

INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE

Can cause mouth, throat, esophagus and stomach irritation, nausea, vomiting and diarrhea.

HEALTH HAZARDS (ACUTE AND CHRONIC)

Reports have associated repeated or prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

CARCINOGENICITY: NTP CARCINOGEN: No IARC MONOGRAPHS: No OSHA REGULATED: No

N/A

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Preexisting eye, skin, liver, kidney and respiratory disorders.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation- Move person to fresh air. If breathing stops, apply artificial respiration and seek medical attention. Eye contact- Flush immediately with a large amount of water for at least 15 minutes and get medical attention. Skin contact- Wash thoroughly wit soap and water while removing contaminated clothing and shoes. Ingestion- Do not induce vomiting! Contact physician or your local poison control center immediately.

Missouri Poison Control Center: 1-800-366-8888; Kansas Poison Control Center: 1-800-332-6633.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

ate all sources of ignition (flames, hot surfaces, and electrical, static, or frictional sparks). Avoid breathing vapors. Ven...ate area. Contain and remove with inert absorbent and non-sparking tools. Keep out of sewers.

WASTE DISPOSAL METHOD

C· ·ct absorbent/spilled liquid into metal containers. Dispose of in accordance with local, state and federal regulations. Do not i. :ate closed containers. Incinerate in approved facility. Obey relevent laws.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep away from excessive heat, sparks or open flames. Keep containers closed when not in use. Store in cool, well ventilated approved areas. Avoid free fall of liquid in excess of a few inches and ground container when pouring. Use non-sparking utensils when handling this material. Keep containers closed and upright when not in use.

OTHER PRECAUTIONS

Do not take internally. Store large quantities in buildings designed to comply with OSHA 1910.106. Emptied containers may retain hazardous residue and explosive vapors. Keep away from heat, sparks and flames. Do not cut, puncture or weld on or near emptied containers. Wash hands after using and before smoking or eating. Follow all hazard precautions given in this data sheet until container is thoroughly cleaned or destroyed. KEEP OUT OF THE REACH OF CHILDREN. Avoid spontaneous combustion of soiled rags, steel wool, spray booth filters, spray residues and other material contaminated with this product by immediately immersing them in a sealed, water-filled metal container prior to disposal.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION

Do not breathe vapors or spray mist. Wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during the use of this product until vapor and mists are exhausted, unless air monitoring demonstrates vapor and mist levels are below applicable exposure limits. Observe OSHA Standard 29CFR 1910.134.

VENTILATION

Provide general clean air dilution or local exhaust ventilation in volume and pattern to keep the air contaminant concentration below the lower explosion limit and applicable exposure limits. Refer to OSHA Standard 29 CFR 1910.94.

P. :ECTIVE GLOVES

Use chemical/solvent impermeable gloves to avoid contact with product.

EYE PROTECTION

Avoid contact with eyes. Use safety eyewear with splash guards or side shields, chemical goggles, face shields.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT

Provide eyewash station and emergency shower. Use of protective creams, head caps, etc. is recommended. Avoid contact with contaminated clothing. Wash contaminated clothing, including shoes, before reuse.

WORK/HYGIENIC PRACTICES

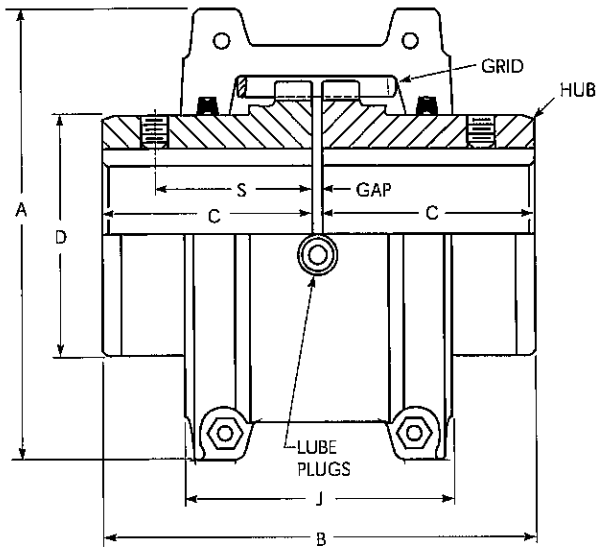
Wash hands before eating or using washroom, smoke in smoking areas only.

SECTION IX - DISCLAIMER

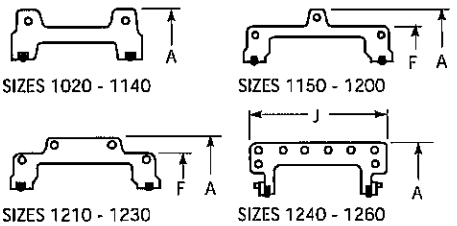
To the best of our knowledge, the information contained herein is based on data considered accurate. No warranty expressed or implied is made. Davis Paint assumes no responsibility for damage to person, property or business caused by the material. It is the responsibility of the purchaser or user of the material to ensure that it is properly used.

Type T10

Close Coupled/Dimensions — Inches



COVER PROFILES – HORIZONTAL SPLIT



Sizes 1020 thru 1230T10 covers are cast aluminum alloy; Sizes 1240 thru 1260T10 are fabricated steel.

SIZE ★	Torque Rating (lb-in) †	Allow Speed rpm ‡	Max Bore ●	Min Bore ■	Cplg Wt With No Bore-lb	Lube Wt lb	DIMENSIONS — INCHES							
							A	B	C	D	F	J	S	Gap
1020T	460	4500	1.125	.500	4.2	.06	3.82	3.88	1.88	1.56	....	2.62	1.54	.125
1030T	1,320	4500	1.375	.500	5.7	.09	4.16	3.88	1.88	1.94	....	2.69	1.54	.125
1040T	2,200	4500	1.625	.500	7.4	.12	4.50	4.12	2.00	2.25	....	2.75	1.58	.125
1050T	3,850	4500	1.875	.750	12	.15	5.32	4.88	2.38	2.62	....	3.12	1.76	.125
1060T	6,050	4350	2.125	.750	16	.19	5.82	5.12	2.50	3.00	....	3.62	2.06	.125
1070T	8,800	4125	2.500	1.062	23	.25	6.25	6.12	3.00	3.44	....	3.75	2.12	.125
1080T	18,150	3600	3.000	1.062	39	.38	7.50	7.12	3.50	4.12	....	4.56	2.54	.125
1090T	33,000	3600	3.500	1.625	56	.56	8.31	7.88	3.88	4.88	....	4.81	2.62	.125
1100T	55,550	2440	4.000	1.625	93	.94	9.88	9.69	4.75	5.59	....	6.12	....	.188
1110T	82,500	2250	4.500	2.375	120	1.12	10.62	10.19	5.00	6.31	....	6.36	....	.188
1120T	121,000	2025	5.000	2.625	179	1.62	12.12	12.00	5.88	7.06	....	7.54	....	.250
1130T	176,000	1800	6.000	2.625	266	2.0	13.62	13.00	6.38	8.56	....	7.68	....	.250
1140T	253,000	1650	7.250	4.250	392	2.5	15.12	14.75	7.25	10.00	....	7.92	....	.250
1150T	352,000	1500	8.000	4.750	500	4.3	17.84	14.65	7.20	10.60	15.40	10.68	....	.250
1160T	495,000	1350	9.000	5.250	681	6.2	19.76	15.85	7.80	12.00	17.20	10.96	....	.250
1170T	660,000	1225	10.000	6.000	987	7.7	22.32	17.25	8.50	14.00	19.18	12.10	....	.250
1180T	915,000	1100	11.000	6.000	1365	8.3	24.80	19.05	9.40	15.50	21.84	12.64	....	.250
1190T	1,210,000	1050	12.000	7.000	1710	9.7	26.60	20.65	10.20	17.20	23.93	12.80	....	.250
1200T	1,650,000	900	13.000	7.000	2331	12.4	29.80	22.25	11.00	19.60	26.00	14.00	....	.250
1210T	2,200,000	820	14.000	7.000	3140	23.2	33.25	24.50	12.00	21.00	29.55	17.00	....	.500
1220T	2,970,000	730	15.000	8.000	3935	35.4	36.25	26.10	12.80	22.50	32.37	19.30	....	.500
1230T	3,850,000	680	16.000	8.000	4997	53.0	39.50	27.70	13.60	24.00	35.62	21.50	....	.500
1240T	4,950,000	630	17.000	10.000	6504	74.5	42.80	29.50	14.50	25.50	....	25.50	....	.500
1250T	6,600,000	580	18.500	10.000	8450	110.5	46.50	32.10	15.80	28.00	....	27.50	....	.500
1260T	8,250,000	540	20.000	10.000	10322	148.1	49.64	34.50	17.00	30.00	....	30.00	....	.500

★ Refer to Page 3 for General Information and Reference Notes.

How To Use This Manual

This manual provides detailed instructions on maintenance, lubrication, installation, and parts identification. Use the table of contents below to locate required information.

Table of Contents

CAREFULLY FOLLOW THE INSTRUCTIONS IN THIS MANUAL FOR OPTIMUM PERFORMANCE AND TROUBLE FREE SERVICE.

INTRODUCTION

This manual applies to Sizes 1020T thru 1140T and 20T thru 140T10 Falk Steelflex Tapered Grid Couplings. Unless otherwise stated, information for Sizes 1020T thru 1140T applies to Sizes 20T thru 140T respectively, e.g. 1020T = 20T, 1100T = 100T, etc. These couplings are designed to operate in either the horizontal or vertical position without modification. Beginning in 1994, these couplings are being supplied with one set of inch series fasteners and one set of metric fasteners. Use either set of fasteners, depending on your preference. Refer to Page 6 for part interchangeability.

The performance and life of the couplings depend largely upon how you install and service them.

CAUTION: Consult applicable local and national safety codes for proper guarding of rotating members. Observe all safety rules when installing or servicing couplings.

WARNING: Lockout starting switch of prime mover and remove all external loads from drive before installing or servicing couplings.

LUBE FITTINGS

Cover halves have $^1/_8$ NPT lube holes. Use a standard grease gun and lube fitting as instructed on Page 4.

LIMITED END FLOAT

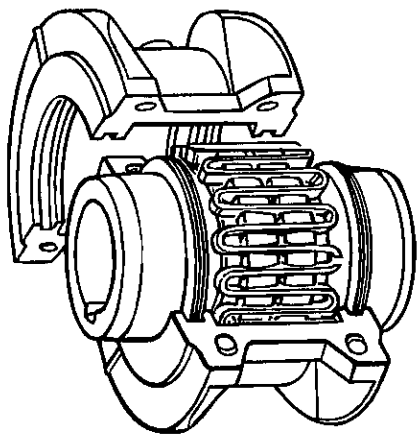
When electric motors, generators, engines, compressors and other machines are fitted with sleeve or straight roller bearings, limited axial end float kits are recommended for protecting the bearings. Falk Steelflex couplings are easily modified to limit end float; refer to Manual 428-820 for instructions.

LUBRICATION

Adequate lubrication is essential for satisfactory operation. Page 2 provides a list of typical lubricants and specifications for general purpose and long term greases. Because of its superior lubricating characteristics and low centrifuge properties, Falk Long Term Grease (LTG) is highly recommended. Sizes 1020T to 1090T10 are furnished with a pre-measured amount of grease for each coupling. The grease can be ordered for larger size couplings.

The use of general purpose grease requires re-lubrication of the coupling at least annually.

TYPE T10 STEELFLEX COUPLING



Long Term Grease (LTG)

The high centrifugal forces encountered in couplings separate the base oil and thickener of general purpose greases. Heavy thickener, which has no lubrication qualities, accumulates in the grid-groove area of Steelflex couplings resulting in premature hub or grid failure unless periodic lubrication cycles are maintained.

Falk Long Term Grease (LTG) was developed specifically for couplings. It resists separation of the oil and thickener. The consistency of Falk LTG changes with operating conditions. As manufactured it is an NLGI #1/2 grade. Working of the lubricant under actual service conditions causes it to become semifluid while the grease near the seals will set to a heavier grade, helping to prevent leakage.

LTG is highly resistant to separation, easily out performing all other lubricants tested. The resistance to separation allows the lubricant to be used for relatively long periods of time.

Steelflex couplings initially lubricated with LTG will not require re-lubrication until the connected equipment is stopped for servicing. If a coupling leaks grease, is exposed to extreme temperatures, excessive moisture, or experiences frequent reversals, more frequent lubrication may be required.

Although LTG grease is compatible with most other coupling greases, the mixing of greases may dilute the benefits of LTG.

USDA Approval

LTG has the United States Department of Agriculture Food Safety & Inspection Service approval for applications where there is no possibility of contact with edible products. (H-2 ratings).

CAUTION: Do not use LTG in bearings.

MORE>

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428-110
November 2000
Supersedes 3-98

Specifications — Falk LTG

The values shown are typical and slight variations are permissible.

AMBIENT TEMPERATURE RANGE — -20°F (-29°C) to 250°F (121°C). Min. Pump = 20° F (-7° C).

MINIMUM BASE OIL VISCOSITY — 3300SSU (715cST) @ 100°F (38°C).

THICKENER — Lithium & soap/polymer.

CENTRIFUGE SEPARATION CHARACTERISTICS — ASTM #D4425 (Centrifuge Test) — K36 = 2/24 max., very high resistance to centrifuging.

NLGI GRADE (ASTM D-217) — $^1/_2$

MINIMUM DROPPING POINT — with 60 stroke worked penetration value in the range of 320 to 365 — 350°F (177°C) min.

MINIMUM TIMKEN O.K. LOAD — 40 lbs.

ADDITIVES — Rust and oxidation inhibitors that do not corrode steel or swell or deteriorate synthetic seals.

Packaging

14 oz. (0,4 kg) CARTRIDGES — Individual or case lots of 10 or 60.

35 lb. (16 kg)PAIL, 120 lb. (54 kg) KEG & 400 lb. (181 kg) DRUMS.

General Purpose Grease

Annual Lubrication — The following specifications and lubricants for general purpose grease apply to Falk Steelflex couplings that are lubricated annually and operate within ambient temperatures of 0°F to 150°F (-18°C to 66°C). For temperatures beyond this range (see Table 1), consult the Factory.

If a coupling leaks grease, is exposed to extreme temperatures, excessive moisture or experiences frequent reversals, more frequent lubrication may be required.

Specifications — General Purpose Coupling Lubricants

The values shown are typical and slight variations are permissible.

DROPPING POINT — 300°F (149°C) or higher.

CONSISTENCY — NLGI No. 2 with 60 stroke worked penetration value in the range of 250 to 300.

SEPARATION AND RESISTANCE — Low oil separation rate and high resistance to separation from centrifuging.

LIQUID CONSTITUENT — Possess good lubricating properties equivalent to a high quality, well refined petroleum oil.

INACTIVE — Must not corrode steel or cause swelling or deterioration of synthetic seals.

CLEAN — Free from foreign inclusions.

General Purpose Greases Meeting Falk Specifications

Lubricants listed below are typical products only and should not be construed as exclusive recommendations.

TABLE 1 — General Purpose Greases

Ambient Temperature Range	0°F to 150°F (-18°C to 66°C)	-30°F to 100°F (-34°C to 38°C)
Manufacturer	**Lubricant †**	**Lubricant †**
Amoco Oil Co.	Amolith Grease #2	Amolith Grease #2
BP Oil Co.	Energrease LS-EP2	Energrease LS-EP1
Chevron U.S.A. Inc.	Dura-Lith EP2	Dura-Lith EP1
Citgo Petroleum Corp.	Premium Lithium Grease EP2	Premium Lithium Grease EP1
Conoco Inc.	EP Conolith Grease #2	EP Conolith Grease #2
Exxon Company, USA	Unirex N2	Unirex N2
E.F. Houghton & Co.	Cosmolube 2	Cosmolube 1
Imperial Oil Ltd.	Unirex N2L	Unirex N2L
Kendall Refining Co.	Lithium Grease L421	Lithium Grease L421
Keystone Div. (Pennwalt)	81 EP-2	81 EP-1
Lyondell Petrochemical (ARCO)	Litholine H EP 2 Grease	Litholine H EP 2 Grease
Mobil Oil Corp.	Mobilux EP111	Mobilith AW1
Petro-Canada Products	Multipurpose EP2	Multipurpose EP1
Phillips 66 Co.	Philube Blue EP	Philube Blue EP
Shell Oil Co.	Alvania Grease 2	Alvania Grease 2
Shell Canada Ltd.	Alvania Grease 2	Alvania Grease 2
Sun Oil Co.	Ultra Prestige 2EP	Ultra Prestige 2EP
Texaco Lubricants	Starplex HD2	Multifak EP2
Unocal 76 (East & West)	Unoba EP2	Unoba EP2
Valvoline Oil Co.	Multilube Lithium EP Grease	. . .

★ Grease application or re-lubrication should be done at temperatures above 20°F (-7°C). If grease must be applied below 20°F (-7°C), consult The Falk Corporation.

† Lubricants listed may not be suitable for use in the food processing industry; check with lube manufacturer for approved lubricants.

INSTALLATION OF TYPE T10 STEELFLEX TAPERED GRID COUPLINGS

Installation

Only standard mechanics tools, wrenches, a straight edge and feeler gauges are required to install Falk Steelflex couplings. Coupling Sizes 1020T thru 1090T are generally furnished for CLEARANCE FIT with setscrew over the keyway. Sizes 1100T and larger are furnished for an INTERFERENCE FIT without a setscrew.

CLEARANCE FIT HUBS — Clean all parts using a non-flammable solvent. Check hubs, shafts and keyways for burrs. Do not heat clearance fit hubs. Install keys, mount hubs with flange face flush with shaft ends or as otherwise specified and tighten setscrews.

INTERFERENCE FIT HUBS — Furnished without setscrews. Heat hubs to a maximum of 275°F (135°C) using an oven, torch, induction heater or an oil bath. To prevent seal damage, DO NOT heat hubs beyond a maximum temperatue of 400°F (205°C).

When an oxy-acetylene or blow torch is used, use an excess acetylene mixture. Mark hubs near the center of their length in several places on hub body with a temperature sensitive crayon, 275°F (135°C) melt temperature. Direct flame towards hub bore using constant motion to avoid overheating an area.

MORE>

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WARNING: If an oil bath is used, the oil must have a flash point of 350°F (177°C) or higher. Do not rest hubs on the bottom of the container. Do not use an open flame in a combustible atmosphere or near combustible materials.

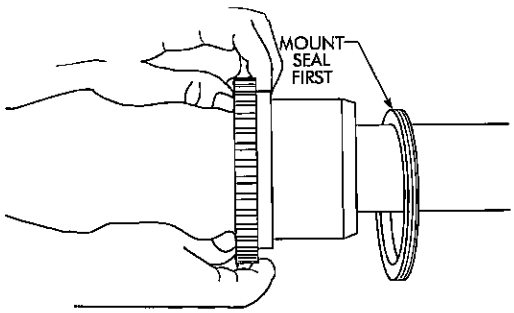
Heat hubs as instructed above. Mount hubs as quickly as possible with hub face flush with shaft end. Allow hubs to cool before proceeding. Insert setscrews (if required) and tighten.

Maximize Performance And Life

The performance and life of couplings depend largely upon how you install and maintain them. Before installing couplings, make certain that foundations of equipment to be connected meet manufacturers' requirements. Check for soft foot. The use of stainless steel shims is recommended. Measuring misalignment and positioning equipment within alignment tolerances is simplified with an alignment computer. These calculations can also be done graphically or mathematically.

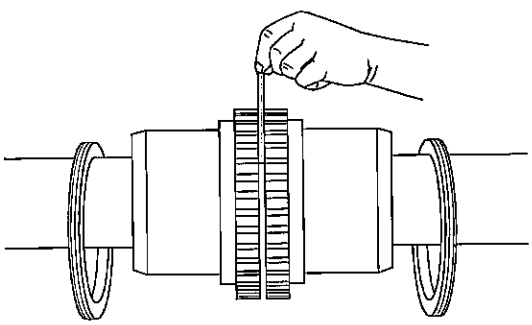
Alignment is shown using spacer bar and straight edge. This practice has proven to be adequate for many industrial applications. However, for superior final alignment, the use of dial indicators (see Manual 458-834 for instructions), lasers, alignment computers or graphical analysis is recommended.

1— Mount Seals And Hubs



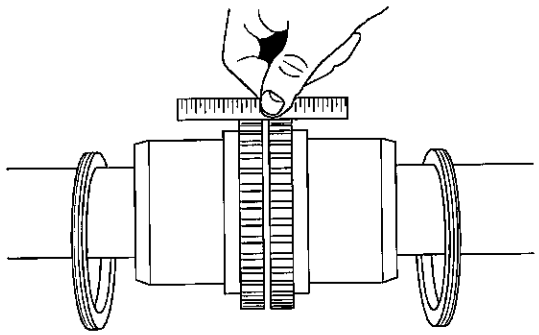
Lock out starting switch of prime mover. Clean all metal parts using a non-flammable solvent. Lightly coat seals with grease and place on shafts BEFORE mounting hubs. Heat interference fit hubs as previously instructed. Seal keyways to prevent leakage. Mount hubs on their respective shafts so the hub face is flush with the end of its shaft unless otherwise indicated. Tighten setscrews when furnished.

2 — Gap and Angular Alignment



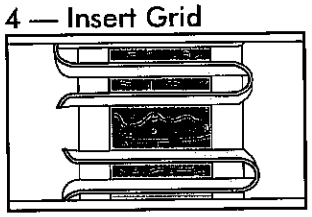
Use a spacer bar equal in thickness to the gap specified in Table 2, Page 5. Insert bar as shown below left, to same depth at 90° intervals and measure clearance between bar and hub face with feelers. The difference in minimum and maximum measurements must not exceed the ANGULAR installation limits specified in Table 2.

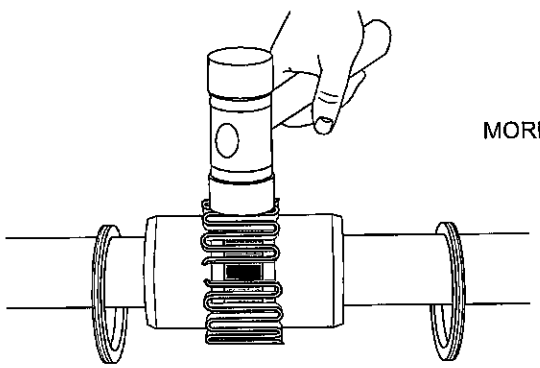
3 — Offset Alignment



Align so that a straight edge rests squarely (or within the limits specified in Table 2) on both hubs as shown above and also at 90° intervals. Check with feelers. The clearance must not exceed the PARALLEL OFFSET installation limits specified in Table 2. Tighten all foundation bolts and repeat Steps 2 and 3. Realign coupling if necessary.

4 — Insert Grid

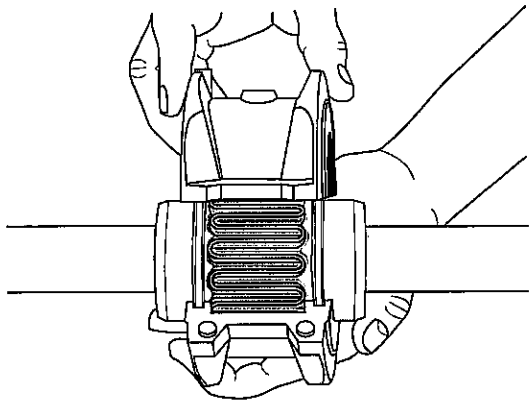


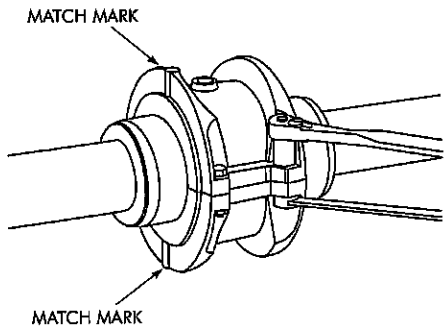


MORE>

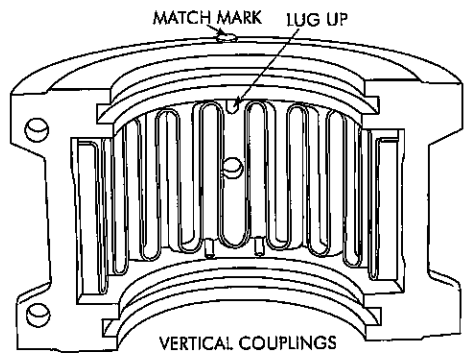
Pack gap and grooves with specified lubricant before inserting grid. When grids are furnished in two or more segments, install them so that all cut ends extend in the same direction (as detailed in the exploded view picture above); this will assure correct grid contact with non-rotating pin in cover halves. Spread the grid slightly to pass over the coupling teeth and seat with a soft mallet.

5 — Pack With Grease And Assemble Covers





Pack the spaces between and around the grid with as much lubricant as possible and wipe off excess flush with top of grid. Position seals on hubs to line up with grooves in cover. Position gaskets on flange of lower cover half and assemble covers so that the match marks are on the same side (see above). If shafts are not level (horizontal) or coupling is to be used vertically, assemble cover halves with the lug and match mark



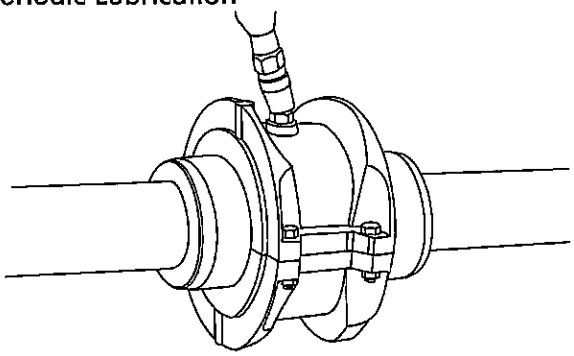
UP or on the high side. Push gaskets in until they stop against the seals and secure cover halves with fasteners, tighten to torque specified in Table 2. Make sure gaskets stay in position during tightening of fasteners. **CAUTION:** *Make certain lube plugs are installed before operating.*

ANNUAL MAINTENANCE

For extreme or unusual operating conditions, check coupling more frequently.

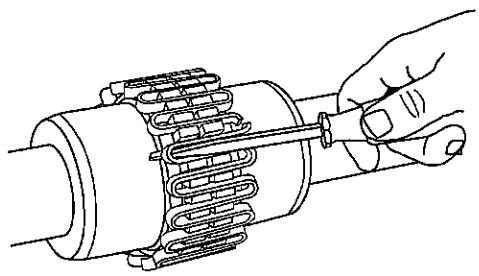
1. Check alignment per steps on Page 3. If the maximum operating misalignment limits are exceeded, realign the coupling to the recommended installation limits. See Table 2 for installation and operating alignment limits.
2. Check tightening torques of all fasteners.
3. Inspect seal ring and gasket to determine if replacement is required. If leaking grease, replace.
4. When connected equipment is serviced, disassemble the coupling and inspect for wear. Replace worn parts. Clean grease from coupling and repack with new grease. Install coupling using new gasket as instructed in this manual.

Periodic Lubrication



The required frequency of lubrication is directly related to the type of lubricant chosen, and the operating conditions. Steelflex couplings lubricated with common industrial lubricants, such as those shown in Table 1, should be relubed annually. The use of Falk Long Term Grease (LTG) will allow relube intervals to be extended to beyond five years. When relubing, remove both lube plugs and insert lube fitting. Fill with recommended lubricant until an excess appears at the opposite hole. **CAUTION:** Make certain all plugs have been inserted after lubricating.

Coupling Disassembly And Grid Removal



Whenever it is necessary to disconnect the coupling, remove the cover halves and grid. A round rod or screwdriver that will conveniently fit into the open loop ends of the grid is required. Begin at the open end of the grid section and insert the rod or screwdriver into the loop ends. Use the teeth adjacent to each loop as a fulcrum and pry the grid out radially in even, gradual stages, proceeding alternately from side to side.

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TYPE T COUPLING INSTALLATION & ALIGNMENT DATA

Maximum life and minimum maintenance for the coupling and connected machinery will result if couplings are accurately aligned. Coupling life expectancy between initial alignment and maximum operating limits is a function of load, speed and lubrication. Maximum operating values listed in Table 2 are based on cataloged allowable rpm.

Values listed are based upon the use of the gaps listed, standard coupling components, standard assemblies and cataloged allowable speeds.

Values may be combined for an installation or operating condition.

Example: 1060T max. operating misalignment is .016" parallel plus .018" angular.

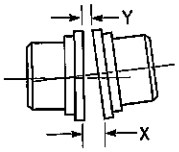
NOTE: For applications requiring greater misalignment, refer application details to Falk.

Angular misalignment is dimension X minus Y as illustrated below.

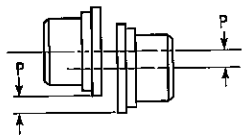
Parallel misalignment is distance P between the hub center lines as illustrated below.

End float (with zero angular and parallel misalignment) is the axial movement of the hubs(s) within the cover(s) measured from "O" gap.

ANGULAR MISALIGNMENT



PARALLEL OFFSET MISALIGNMENT



END FLOAT

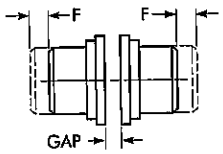


TABLE 2 — Misalignment & End Float

SIZE	Installation Limits						Operating Limits						Cover Fastener Tightening Torque Values		Allow Speed (rpm)	Lube Wt	
	Parallel Offset-P		Angular (x-y)		Hub Gap ±10%		Parallel Offset-P		Angular (x-y)		End Float Physical Limit (Min) 2 x F						
	Max Inch	Max mm	Max Inch	Max mm	Inch	mm	Max Inch	Max mm	Max Inch	Max mm	Inch	mm	In Series Fasteners (lb-in)	Metric Fasteners (Nm)		lb	kg
1020T	.006	0,15	.003	0,08	.125	3	.012	0,30	.010	0,25	.210	5,33	100	11,3	4500	.06	0,03
1030T	.006	0,15	.003	0,08	.125	3	.012	0,30	.012	0,30	.198	5,03	100	11,3	4500	.09	0,04
1040T	.006	0,15	.003	0,08	.125	3	.012	0,30	.013	0,33	.211	5,36	100	11,3	4500	.12	0,05
1050T	.008	0,20	.004	0,10	.125	3	.016	0,41	.016	0,41	.212	5,38	200	23,6	4500	.15	0,07
1060T	.008	0,20	.005	0,13	.125	3	.016	0,41	.018	0,46	.258	6,55	200	23,6	4350	.19	0,09
1070T	.008	0,20	.005	0,13	.125	3	.016	0,41	.020	0,51	.259	6,58	200	23,6	4125	.25	0,11
1080T	.008	0,20	.006	0,15	.125	3	.016	0,41	.024	0,61	.288	7,32	200	23,6	3600	.38	0,17
1090T	.008	0,20	.007	0,18	.125	3	.016	0,41	.028	0,71	.286	7,26	200	23,6	3600	.56	0,25
1100T	.010	0,25	.008	0,20	.188	5	.020	0,51	.033	0,84	.429	10,90	312	35	2440	.94	0,43
1110T	.010	0,25	.009	0,23	.188	5	.020	0,51	.036	0,91	.429	10,90	312	35	2250	1.1	0,51
1120T	.011	0,28	.010	0,25	.250	6	.022	0,56	.040	1,02	.556	14,12	650	73	2025	1.6	0,74
1130T	.011	0,28	.012	0,30	.250	6	.022	0,56	.047	1,19	.551	14,00	650	73	1800	2.0	0,91
1140T	.011	0,28	.013	0,33	.250	6	.022	0,56	.053	1,35	.571	14,50	650	73	1650	2.5	1,14

TABLE 3 — Coupling Cover Fastener Identification

SIZE	Inch Series Fasteners				METRIC FASTENERS	
	Old Style		New Style			
1020-1070T10		SAE Grade 8 ★		SAE Grade 8		Property Class 10.9
1080-1090T10		SAE Grade 8		SAE Grade 8		Property Class 10.9
1100-1140T10		SAE Grade 5		SAE Grade 5		Property Class 8.8

★ Older style covers, Sizes 1020T10 thru 1070T10 must utilize socket head cap screws and locknuts held by the cover.

PARTS IDENTIFICATION

All coupling parts have identifying part numbers as shown below. Parts 3 and 4 (Hubs and Grids), are the same for both Type T10 and T20 couplings. All other coupling parts are unique to Type T10. When ordering parts, always SPECIFY SIZE and TYPE shown on the COVER.

PARTS INTERCHANGEABILITY

Parts are interchangeable between Sizes 20T and 1020T, 30T and 1030T, etc. except as noted.

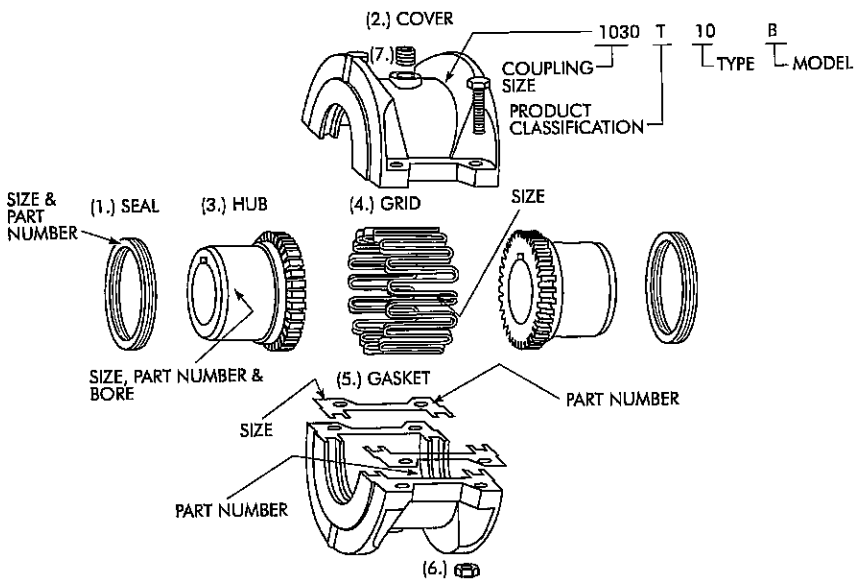
GRIDS — Size 1020T thru 1140T Steelflex couplings use blue grids. Older models, 20T thru 140T, use orange grids.

CAUTION: Blue grids may be used in all applications, but DO NOT substitute orange grids for blue.

*COVERS — **CAUTION:** DO NOT mix cover halves of different designs. Sizes 1020T thru 1070T10 covers have been manufactured in several different two-rib designs and 80T thru 140T covers have been manufactured with two and three ribs.*

HARDWARE — Older style covers, Sizes 1020T10 thru 1070T10, utilized socket head cap screws with captured locknuts. The new style covers use hex head cap screws (either inch or metric) and unrestrained locknuts. Specify either inch series SOCKET head or metric series HEX head cap screws when ordering replacement parts.

PART NUMBER LOCATION



PART DESCRIPTION

1. Seal (T10)
2. Cover (T10)
3. Hub (Specify bore and keyway)
4. Grid
5. Gasket (T10)
6. Fasteners (T10) — Coupling may be supplied with one set each of inch series fasteners and metric fasteners.
7. Lube Plug

ORDER INFORMATION

1. Identify part(s) required by name above.
2. Furnish the following information.

   EXAMPLE:
   Coupling Size: 1030
   Coupling Type: T10
   Model: B
   Bore: 1.375
   Keyway: .375 x .187
3. Price parts from Price List 422-110 and appropriate discount sheet.

The Falk Corporation, P.O. Box 492, Zip 53201-0492
3001 W. Canal St., Zip 53208-4200, Milwaukee, WI USA Telephone: 414-342-3131
Fax: 414-937-4359 e-mail: falkinfo@falkcorp.com web: www.falkcorp.com

Introduction

Adequate lubrication is essential for satisfactory operation. This manual provides a list of typical lubricants and specifications for general purpose and long term greases.

The use of general purpose grease requires re-lubrication of the coupling at least annually. By initially using Falk long term grease (LTG), re-lubrication will not be required again until the connected equipment is stopped for servicing.

Long Term Grease (LTG)

The high centrifugal forces encountered in couplings separate the base oil and thickener of general purpose greases. Heavy thickener which has no lubrication qualities, accumulates in the grid-groove area of Steelflex couplings resulting in premature hub or grid failure unless periodic lubrication cycles are maintained.

LONG TERM GREASE LTG Falk LTG was developed specifically for couplings. It resists separation of the oil and thickener. The consistency of Falk LTG changes with operating conditions. As manufactured it is an NLGI #1/2 grade. Working of the lubricant under actual service conditions causes it to become semifluid while the grease near the seals will set to a heavier grade, helping to prevent leakage

LTG is highly resistant to separation, easily out performing all other lubricants tested. The resistance to separation allows the lubricant to be used for relatively long periods of time.

Steelflex couplings initially lubricated with Falk Long Term grease (LTG) will not require re-lubrication until the connected equipment is stopped for servicing. If a coupling leaks grease, is exposed to extreme temperatures, excessive moisture or experiences frequent reversals, more frequent lubrication may be required.

USDA Approval

LTG has the United States Department of Agriculture Food Safety & Inspection Service approval for applications where there is no possibility of contact with edible products. (H-2 rating).

CAUTION: Do not use LTG in bearings.

Specifications

The values shown are typical and slight variations are permissible.

AMBIENT TEMPERATURE RANGE — –20°F (–29°C) to 250°F (121°C). Min. Pump = 20°F (–7°C)

MINIMUM BASE OIL VISCOSITY — 3300SSU (715cST) @ 100°F (38°C)

THICKENER — Lithium & soap/polymer.

CENTRIFUGE SEPARATION CHARACTERISTICS — ASTM #D4425-84 Centrifuge Test) — K36 = 2/24 maximum, very high resistance to centrifuging.

NLGI GRADE (ASTM D-217) — 1/2

CONSISTENCY (ASTM D-217) — 60 stroke worked penetration value in the range of 315 to 360 measured at 77°F (25°C)

MINIMUM DROPPING POINT — 350°F (177°C) min.

MINIMUM TIMKEN EP O.K. LOAD — 40 lb (18 kg).

ADDITIVES — Rust and oxidation inhibitors that do not corrode steel or swell or deteriorate synthetic seals.

INSPECTION — When connected equipment is serviced, disassemble the coupling and inspect for wear. Replace worn parts. Clean the grease from the coupling and repack with fresh LTG. Install coupling using new gasket as instructed in the appropriate installation manual.

Packaging

14 oz CARTRIDGES — For use in standard industrial lubrication guns.

35 lb PAILS — Ideal for larger size couplings or many smaller sizes.

120 lb KEG — For plants with many small couplings or large size couplings. Best for hand packing.

400 lb DRUMS — For plants with a pressurized lubrication system.

CASE LOTS — 10 pack – 14 oz cartridges, 60 – 14 oz cartridges.

The Falk Corporation, P.O. Box 492, Zip 53201-0492
3001 W. Canal St., Zip 53208-4200, Milwaukee, WI USA Telephone: 414-342-3131
Fax: 414-937-4359 e-mail: falkinfo@falkcorp.com web: www.falkcorp.com

428-010
February 1996 (.pdf revision)
Supersedes 6-88

General Purpose Grease

ANNUAL LUBRICATION — The following specifications and lubricants for general purpose grease apply to Falk Steelflex couplings that are lubricated annually and operate within ambient temperatures of 0° to 150°F (–18° to 66°C) For temperatures beyond this range, consult the Factory.

If coupling leaks grease, is exposed to extreme temperatures, excessive moisture or experiences frequent reversals; more frequent lubrication may be required.

Specifications — General Purpose Coupling Lubricants

The values shown are typical and slight variations are permissible.

DROPPING POINT — 300°F (149°C) or higher.

CONSISTENCY — NLGI No. 2 with 60 stroke worked penetration value in the range of 265 to 295.

SEPARATION AND RESISTANCE — Low oil separation rate and high resistance to separation from centrifuging.

LIQUID CONSTITUENT — Possess good lubricating properties, equivalent to a high quality, well refined petroleum oil.

INACTIVE — Must not corrode steel or cause swelling or deterioration of synthetic seals.

CLEAN — Free from foreign inclusions.

General Purpose Greases Meeting Falk Specifications

Lubricants listed in Table 1 are typical products only and should not be construed as exclusive recommendations.

TABLE 1 — General Purpose Greases

Ambient Temperature Range	0°F to 150°F (–18°C to +66°C)	–30°F to 100° F –34°C to +38°C)
Manufacturer	**Lubricant**	**Lubricant**
Amoco Oil Co.	Amolith Grease #2	Amolith Grease #2
BP Oil Co.	Energrease LS-EP2	Energrease LS-EP1
Chevron U.S.A. Inc.	Dura-Lith EP2	Dura-Lith EP1
Citgo Petroleum Corp.	Premium Lithium Grease EP2	Premium Lithium Grease EP1
Conoco Inc.	EP Conolith Grease #2	EP Conolith Grease #2
Exxon Company, USA	Unirex N2	Unirex N2
E.F. Houghton & Co.	Cosmolube 2	Cosmolube 1
Imperial Oil Ltd.	Unirex N2L	Unirex N2L
Kendall Refining Co.	Lithium Grease L421	Lithium Grease L421
Keystone Div. (Pennwalt) Corp.	81 EP-2	81 EP-1
Lyondell Petrochemical (ARCO)	Litholine H EP 2 Grease	Litholine H EP 2 Grease
Mobil Oil Corp.	Mobilux EP111	Mobilith AW1
Petro-Canada Products	Multipurpose EP2	Multipurpose EP1
Phillips 66 Co.	Philube Blue EP	Philube Blue EP
Shell Oil Co.	Alvania Grease 2	Alvania Grease 2
Shell Canada Ltd.	Alvania Grease 2	Alvania Grease 2
Sun Oil Co.	Ultra Prestige 2EP	Ultra Prestige 2EP
Texaco Lubricants	Starplex HD2	Multifak EP2
Unocal 76 (East & West)	Unoba EP2	Unoba EP2
Valvoline Oil Co.	Multilube Lithium EP Grease	...

★ Grease application or re-lubrication should be done at temperatures above 20°F (7°C). If grease must be applied below 20°F (7°C), consult The Falk Corporation. Lubricants listed may not be suitable for use in the food processing industry; check with lube manufacturer for approved lubricants.

The Falk Corporation, P.O. Box 492, Zip 53201-0492
3001 W. Canal St., Zip 53208-4200, Milwaukee, WI USA Telephone: 414-342-3131
Fax: 414-937-4359 e-mail: falkinfo@falkcorp.com web: www.falkcorp.com

Pentair Pump Group

3601 Fairbanks Avenue
Kansas City, KS 66110
913-371-5000 FAX 913-748-4025

CERTIFIED MOTOR PERFORMANCE DATA

MOTOR MANUFACTURER: U.S. ELECTRICAL MOTORS **DATE:** 15-Dec-11

FM PURCHASE ORDER #: 2706143 **FM TAG#:** 095078A01

PERFORMANCE DATA BASED ON STANDARD RULES OF: X IEEE X ASA X NEMA

HP	SYNCHRONOUS SPEED (RPM)	FULL LOAD * SPEED (RPM)	FRAME NUMBER	TYPE	ENCLOSURE
3	1800	1775	182VP	TVI	TEFC

*Full Load Speed Tolerance Per NEMA MG1-12.46 is+/- 20% of slip (Slip=Synchronous RPM-Full Load RPM)

PHASE	HERTZ	VOLTS	AMPERES FULL LOAD	AMPERES LOCKED ROTOR	INSULATION CLASS	MAX. TEMP. RISE X ____RESIS. ____THERM.	SERVICE FACTOR	NEMA KVA/HP CODE	NEMA DESIGN
3	60	230	8	59.0	F	105 DEG C AT 1.0 SF	1.15	J	B
		460	4	29.3					

MINIMUM GUAR EFFICIENCY			POWER FACTOR			TORQUE AT FULL VOLTAGE		
						FULL LOAD TORQUE AT FULL LOAD SPEED (LB.FT)	LOCKED STARTING	PULLOUT BREAKDOWN
FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD		PERCENT OF FULL LOAD	
88.5	88.9	86.8	81.6	76.6	65.9	8.9	263	358

VSS [X] VHS [ ] NRR [ ] SRC [ ] HORIZ [ ]

BEARINGS:

Drive End Lubrication:
[ ] Oil [X] Grease

Opposite End Lubrication:
[ ] Oil [X] Grease

PAINT: (Attach Technical Data Sheets)
[X] Factory Standard
[ ] Other _____

MOTOR NO.: 11712968

MOTOR WEIGHT: 150 LBS.

ROTATION: [X] BI-DIRECTIONAL [ ] CW [ ] CCW

Certified by: _____ Date: 15-Dec-11 Revision # _____

FM013/0194

Pentair Pump Group

3601 Fairbanks Avenue
Kansas City, KS 66110
913-371-5000 FAX 913-748-4025

Accessory Data

Motor Manufacturer: U.S. ELECTRICAL MOTORS Date: 15-Dec-11

FM Purchase Order #: 2706143 FM Tag #: 095078A01

	Required	Not Required	Description
Space Heaters:	☐	☒	Watts: _____ Voltage: _____
Thermostats:	☒	☐	Type: ☐ N.O. ☒ N.C.
Thermistors:	☐	☒	Make & Model: _____ Trip Range: _____ Quantity Per Motor: _____ ☐ relay not Supplied ☐ relay supplied: Type: ☐ factory set ☐ field adjustable ☐ wiring diagram/cut sheet attached. Ref.: _____
Winding RTD's:	☐	☒	Make & Model: _____ Construction/OHM Rating: _____ Quantity Per Motor: _____ ☐ relay not Supplied ☐ relay supplied: Type: ☐ factory set ☐ field adjustable ☐ wiring diagram/cut sheet attached. Ref.: _____
Bearing RTD's:	☐	☒	Make & Model: _____ Construction/OHM Rating: _____ Quantity ☐ relay not Supplied ☐ relay supplied: Type: ☐ factory set ☐ field adjustable ☐ wiring diagram/cut sheet attached. Ref.: _____
Vibration Sensor:	☐	☒	Make & Model: _____ Quantity ☐ relay not Supplied ☐ relay supplied: Type: ☐ factory set ☐ field adjustable ☐ wiring diagram/cut sheet attached. Ref.: _____
Tests:	☒	☐	☒ Short commercial, unwitnessed ☐ Short commercial, witnessed ☐ Complete Initial Test, unwitnessed ☐ Complete Initial Test, witnessed ☐ Sound Test, unwitnessed ☐ Sound Test, witnessed ☐ Vibration Test, unwitnessed ☐ IEEE 841 + No Load Test

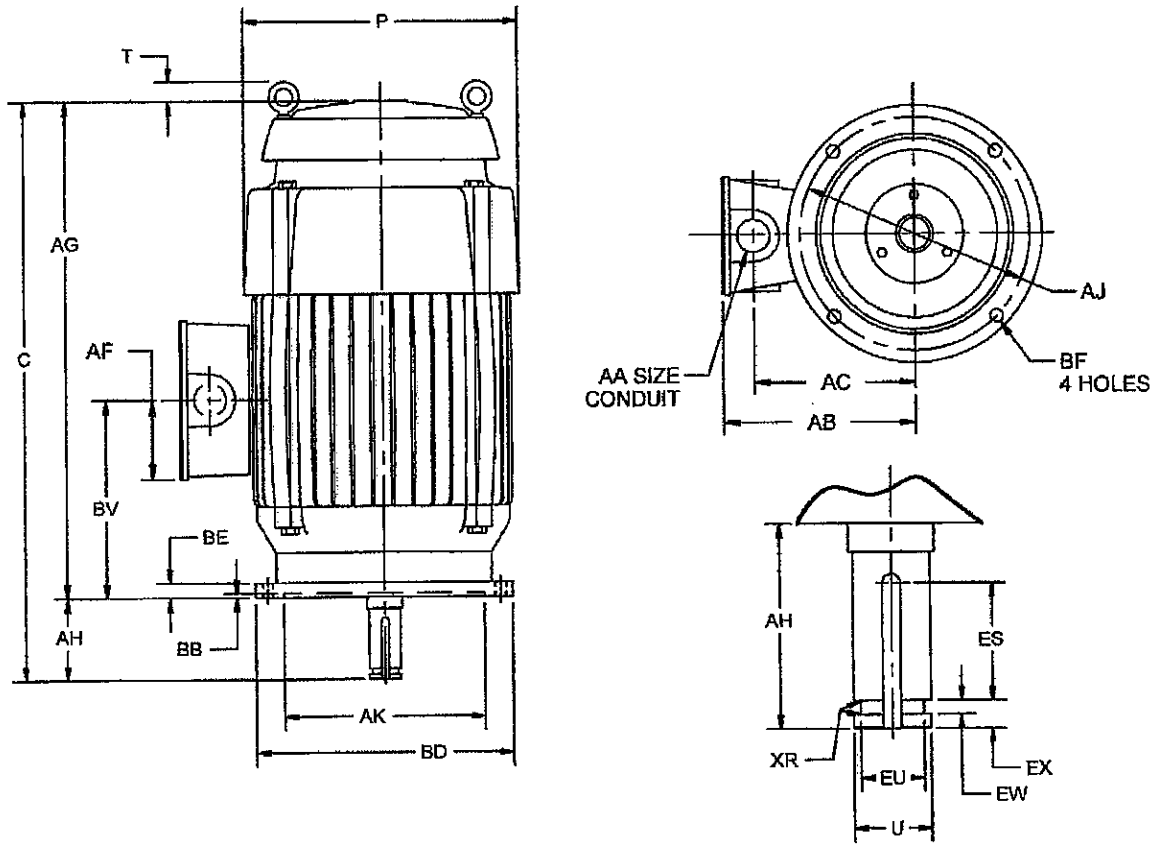
Other Features: TEFC, VERTICAL SOLID SHAFT, NORMAL THRUST, PREMIUM EFFICIENT, INVERTER DUTY 1.15 SERVICE FACTOR (1.0 ON VFD POWER), CLASS F INSULATION, 40 DEGREE C AMBEINT, 6000 FT ALT DUAL ROTATION, Q3 N.C. THERMOSTATS, OVERSIZED CONDUIT BOX, GROUND LUG, GREASE LUBED BRGS BD = 10, AH = 2 3/4, U = 1 1/8

Exceptions & Clarifications: _____

Certified by: _____ Date: 15-Dec-11 Revision #: _____

FM015/0198

EFFECTIVE: 02-MAR-11	VERTICAL MOTORS TEFC FRAME: 182, 184, 213, 215VP BASIC TYPE: TV	PRINT: 09-2381
SUPERSEDES: 28-NOV-05		SHEET: 1 OF 1



ALL DIMENSIONS ARE IN INCHES AND MILLIMETERS

	UNITS	C	P [2]	T	U -.0005	AA	AB	AC	AF	AG	AH ±.063	AJ	AK +.003
■	IN	22.19	11.13	1.31	1.1250	1.00	7.88	6.63	3.19	19.44	2.750	9.125	8.250
	MM	564	283	33	28.575		200	168	81	494	69.85	231.78	209.55

	UNITS	BB MIN	BD MAX	BE	BF	BV	ES MIN	EU -.005	EW +.002	EX -.005	XR	SQ KEY
■	IN	.19	10.00	.75	.44	8.00	1.25	.875	.375	.750	.03	.250
	MM	5	254	19	11	203	32	22.23	9.53	19.05	1	6.35

TOLERANCES	
FACE RUNOUT	.004 T.I.R.
PERMISSIBLE ECCENTRICITY OF MOUNTING RABBET	.004 T.I.R.
PERMISSIBLE SHAFT RUNOUT	.002 T.I.R

1: ALL ROUGH DIMENSIONS MAY VARY BY .25" DUE TO CASTING AND/OR FABRICATION VARIATIONS.
2: LARGEST MOTOR WIDTH.
3: CONDUIT OPENING MAY BE LOCATED IN STEPS OF 90°. STANDARD AS SHOWN WITH CONDUIT OPENING DOWN.
4: TOLERANCES SHOWN ARE IN INCHES ONLY.
5: DIMENSIONS APPLY TO 180 FRAME PREMIUM EFFICIENT MOTORS AND ALL 210 FRAME MOTORS.

09-2381/D

Nidec Motor Corporation
St. Louis, Missouri

ISSUED BY	R. KING
APPROVED BY	K. POTTER

IHP_DP_NMCA (MAR-2011) SOLIDEDGE

9700

Thermal Protector for Motor/Fluorescent ballasts and Temperature Sensing Controls

The Klixon® 9700 protector is a field proven miniature protector developed to protect shaded pole and permanent split capacitor motors, fluorescent ballasts, solenoids, transformers and other electrical equipment against overheating.

In addition to being small and lightweight, the unit is both temperature and current sensitive. Since the 9700 is sealed to withstand varnish dipping, it can be mounted directly in windings where it can best sense the true temperature of the electrical equipment. As a result, over-temperature protection is assured.

Since the case is not electrically insulated, the protector is furnished with a durable Mylar insulating sleeve. Shrinkable and non-shrinkable sleeves are available.

KEY BENEFITS

Miniature size-compact design assures ease of installation

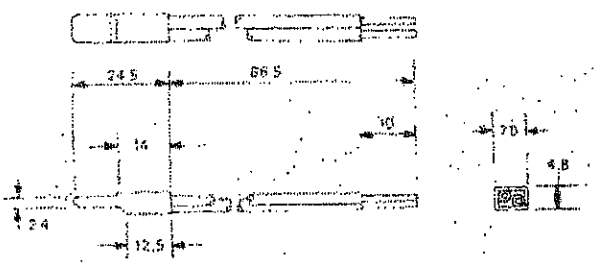
Precision Calibration-temperature calibrated and inspected in controlled ambients for dependable consistent performace

Snapaction-positive make and break assured with proven Klixon® strip disc...contact pressure at open temperature eliminates nuisance trips due to vibration

Sealed steel case-withstands impregnation and baking...maybe varnish dipped...prevents changes in calibration during installation

Technical Characteristics

Purpose of control:	thermal motor protector (TMP) thermal ballast protector (TBP) thermal cut-out (TCO)
Contact capacity:	250VAC 13A for TCO 250VAC 2A for TBP
Temperature range:	60°C to 150°C for TCO and TMP 60°C to 135°C for TBP
Tolerance on Open temp:	+/- 5K or +/- 8K
Automatic action:	Type 3C for TMP Type 2C for TBP and TCO
Operating time:	Continuous
Pollution situation:	Normal
Extent of sensing element:	Whole control
PTI of the insulation:	175
Enclosure protection degree:	IP00



9700 X X YY - ZZZZ

Z : Wire Lead and sleeve
Serial number is assigned for each lead and sleeve configuration, i.e. wire type, length, AWG#, stripped length, sleeve type, and length.

Y : Operating temperature and actuation disc material
Serial number is assigned for each desired temperature and resistance rating.

Nominal operating temperature	Resistance of actuation disc (ohms/cmf)				
	30	250	850	100	475
	Temperature code				
60	56	57	58	59	60
80	91	92	93	94	95
90	21	22	23	24	25
100	26	27	28	29	30
110	36	37	38	39	40
120	1	2	3	4	5
130	11	12	13	14	15
140	66	67	68	69	70
150	46	47	48	49	50

This is a typical temperature code. There is a temperature code at each 5°C in a step from 60 to 150°C.

X . Open Temperature tolerance
: +/- 5K
2: +/- 8K

X : Contact material combination

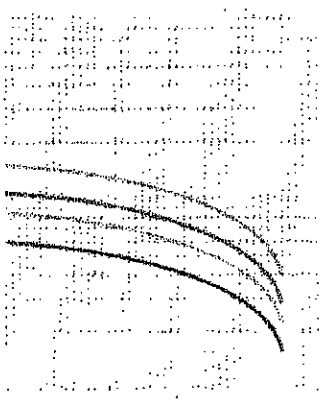
Code	Stationaly contact	Movable contact
L	Steel + Fine silver	Steel + copper + Silver Cadmium oxide
K	Ag-Ni + Silver Cadmium oxide	Steel + copper + Silver Cadmium oxide
H	Brass + Fine silver	Steel + copper + Silver Cadmium oxide
P	Ag-Ni + Fine silver	Steel + Fine silver
S	Brass + Fine silver	Steel + Copper + Ag-Ni

Type "S" is set up for Cadmium-free contact

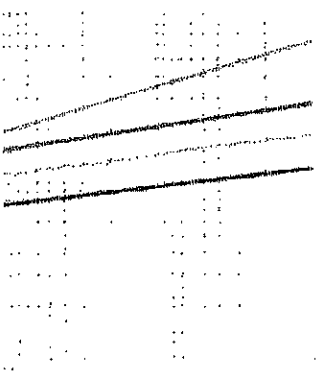
9700 : Device Identification

Example :
9700K01-215
Bimetal of 30ohms/cmf,
120°C operating temperature,
+/-5K tolerance with
AWG#18(UL3343 125°, 600V)
66.7mm length leads,
thick 0.15mm, dia. 6.9mm.
length 34mm, Mylar sleeve

Ultimate trip current vs ambient temperature



Average first cycle tripping time vs current 25 °C ambient



Certifications

Agency	File number	Standard	Note
UL	E 15962	UL2111	Motor protector
ENEC	2014531.10	EN60730-2-9	Thermal cut-out
ENEC	2014531.10	EN60730-2-2	Thermal motor protector
ENEC	2014531.10	EN60730-2-3	Thermal ballast protector
CQC	CQC0200	2001344	

Sensata Technologies

TECHNICAL / SALES SUPPORT

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Italy
Phone +39 039 6568310 Fax +39 039 6568316

Internet: www.sensata.com

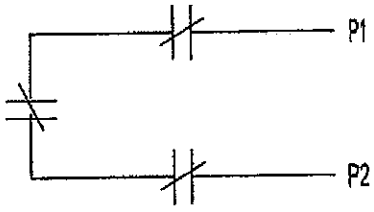
Email: info-cpe@list.sensata.com

THERMOSTATS

1. MOTOR IS EQUIPPED WITH QTY-3 (1 PER PHASE) NORMALLY CLOSED THERMOSTATS. THERMOSTATS ARE SET TO OPEN AT HIGH TEMPERATURE.

2. CONTACT RATINGS FOR THERMOSTATS: 120-600 VAC, 720 VA

N. C. THERMOSTATS



NOTE: THERMOSTATS LEADS MAY BE LOCATED IN EITHER THE MAIN OUTLET BOX OR IF SO EQUIPPED, AN AUXILIARY BOX.

ACCESSORY LISTING
QTY-3 N.C. THERMOSTATS

REVISION DESCRIPTION FOR: MISC STL0211 - UPDATED FORMAT .	SCALE: NONE	UNITS: IN	TITLE: CUSTOMER CONNECTION DIAGRAM	NIDEC MOTOR CORPORATION	
	TOLERANCES ON DIMENSIONS (UNLESS OTHERWISE SPECIFIED)				
MATERIAL: —	INCHES	mm	ISSUED BY: R. KING	APPROVED BY: C. CADE	REVISION DATE: 24-FEB-11
MUST BE COMPLIANT TO RoHS DIRECTIVE EU 2002/95/IEC AND REGULATION EC 1907/2006 (REACH) AS AMENDED	ANGLES X°= ±1°		CODE	DWG NO. 0834066	REV G / SHEET NUMBER 1 OF 1 / DWG SIZE A

IX. LUBRICATION

Motor must be at rest and electrical controls should be locked open to prevent energizing while being serviced. If motor is being taken out of storage refer to **Section III "STORAGE", item 4** for instructions.

1. Oil Lubricated Bearings.

Motors are tested with oil at our manufacturing facility then drained prior to shipment. A small amount of residual oil and rust inhibitor will remain in the oil sump. This residual oil and rust inhibitor is compatible with Turbine Type Mineral Oils and Synthetic, PAO (Poly Alpha Olefin) based oils listed in this manual. It is not necessary to drain this residual oil when adding new oil for operation.

Change oil once per year with normal service conditions. Frequent starting and stopping, damp or dusty environment, extreme temperature, or any other severe service conditions will warrant more frequent oil changes. If there is any question, consult Emerson Motor Co. Product Service Department for recommended oil change intervals regarding your particular situation.

Determine required oil ISO Viscosity Grade (VG) and base oil type from Table 3, then see Table 4 for approved oils. Add oil into oil fill hole at each bearing housing until the oil level reaches between minimum and maximum marks located on the sight gauge window. It is important to wipe excess oil from the threads of the drain hole and to coat the plug threads with Gasoila®† P/N SS08, manufactured by Federal Process Corporation or equivalent thread sealant before replacing the drain plug. Plug should be tightened to a minimum of 20 lb.-ft. using a torque wrench. See the motor nameplate or Table 5 for the approximate quantity of oil required.

2. Grease Lubricated Bearings.

A. Relubrication of Units in Service

Grease lubricated bearings are pre-lubricated at the factory and normally do not require initial lubrication. Relubricating interval depends upon speed, type of bearing and service. Refer to Table 1 or suggested regreasing intervals and quantities. Note that operating environment and application may dictate more frequent lubrication. To relubricate bearings, remove the drain plug. Inspect grease drain and remove any blockage (caked grease or foreign particles) with a mechanical probe, taking care not to damage bearing.

⚠ WARNING

Under NO circumstances should a mechanical probe be used while the motor is in operation.

Add new grease at the grease inlet. New grease must be compatible with the grease already in the motor (refer to table 2 for compatible greases).

⚠ CAUTION

Greases of different bases (lithium, polyurea, clay, etc.) may not be compatible when mixed. Mixing such greases can result in reduced lubricant life and premature bearing failure. Prevent such intermixing by disassembling motor, removing all old grease and repacking with new grease per item B of this section. Refer to Table 2 for recommended greases.

Run the motor for 15 to 30 minutes with the drain plug removed to allow purging of any excess grease. Shut off unit and replace the drain plug. Return motor to service.

⚠ CAUTION

Overgreasing can cause excessive bearing temperatures, premature lubricant breakdown and bearing failure. Care should be exercised against overgreasing.

B. Change of Lubricant

Motor must be disassembled as necessary to gain full access to bearing housing(s).

Remove all old grease from bearings and housings (including all grease fill and drain holes). Inspect and replace damaged bearings. Fill bearing housings both inboard and outboard of bearing approximately 30 percent full of new grease. Grease fill ports must be completely charged with new grease. Inject new grease into bearing between rolling elements to fill bearing. Remove excess grease extending beyond the edges of the bearing races and retainers.

Table 1
Recommended Grease Replenishment Quantities & Lubrication Intervals

Bearing Number		Grease Replenishment Quantity (Fl.Oz.)	Lubrication Interval		
62xx, 72xx	63xx, 73xx		1801 thru 3600 RPM	1201 thru 1800 RPM	1200 RPM and slower
03 thru 07	03 thru 06	0.2	1 Year	2 Years	2 Years
08 thru 12	07 thru 09	0.4	6 Months	1 Year	1 Year
13 thru 15	10 thru 11	0.6	6 Months	1 Year	1 Year
16 thru 20	12 thru 15	1.0	3 Months	6 Months	6 Months
21 thru 28	16 thru 20	1.8	3 Months	6 Months	6 Months

Refer to motor nameplate for bearings provided on a specific motor. For bearings not listed in Table 1, the amount of grease required may be calculated by the formula:

$G = 0.11 \times D \times B$

Where: G = Quantity of grease in fluid ounces.
D = Outside diameter of bearing in inches.
B = Width of bearing in inches.

Table 2
Recommended Greases

Motor Frame Size	Motor Enclosure	Grease Manufacturer	Grease (NLGI Grade 2)
All Thru 447	All	Chevron USA, Inc. Exxon Mobil	Grease No. 83343 SRI No. 2 Polyrex-EM
449 and Up	Open Dripproof		
449 and Up	TEFC and Explosionproof	Exxon Mobil	Grease No. 974420 Mobilith SHC-100

The above greases are interchangeable with the grease provided in units supplied from the factory (unless stated otherwise on motor lubrication nameplate).

Table 3
Emerson Motor Co. Recommended Oil Viscosities

Angular Contact Thrust Bearing (7XXX Series)					
Motor Enclosure	**Frame Size**	**Speed (RPM)**	**Ambient Temperature**	**ISO VG**	**Base Oil Type**
Open Dripproof or Weather Protected	324 and Larger	All	-15C thru 40C (5-104F)	32	Mineral or Synthetic
			41C thru 50C (105-122F)	68	Synthetic Only
Totally Enclosed or Explosion proof	404 thru 447		-15C thru 40C (5-104F)	32	Mineral or Synthetic
			41C thru 50C (105-122F)	68	Synthetic Only
	449 thru 5811	1801 - 3600	-15C thru 40C (104F)	32	Synthetic Only
		1800 & Below		68	Synthetic Only
		All	41C thru 50C (105-122F)	Refer to Office	
Spherical Roller Thrust Bearing (29XXX Series)					
Motor Enclosure	**Frame Size**	**Speed (RPM)**	**Ambient Temperature**	**ISO VG**	**Base Oil Type**
Open Dripproof or Weather Protected	444 and Larger	1800 and Below	-15C thru 25C (5-77F)	68	Mineral or Synthetic
			6C thru 40C (42-104F)	150	
			41C thru 50C (105-122F)		Synthetic Only
Totally Enclosed or Explosion proof	449 and Larger		-15C thru 25C (5-77F)	68	Mineral or Synthetic
			6C thru 40C (42-104F)	150	Synthetic Only
			41C thru 50C (105-122F)	Refer to Office	

Notes:
1. If lower guide bearing is oil lubricated, it should use the same oil as the thrust bearing.
2. If lower guide bearing is grease-lubricated, refer to TABLE 2 for recommended greases.
3. Refer to Emerson Motor Co. for ambient temperatures other than those listed.

Table 4
Emerson Motor Co. Approved Oil Specifications For Use With Anti-Friction Bearings

Oil Manufacturer	ISO VG 32		ISO VG 68		ISO VG 150	
	Viscocity: 130-165 SSU @ 100F		Viscocity: 284-347 SSU @ 100F		Viscocity: 620-765 SSU @ 100F	
	Mineral Base Oil	Synthetic Base Oil	Mineral Base Oil	Synthetic Base Oil	Mineral Base Oil	Synthetic Base Oil
Chevron USA, Inc	GST Turbine Oil 32	Tegra 32	GST Turbine Oil 68	Tegra 68	R & O Machine Oil 150	Tegra 150
Conoco Oil Co.	Hydroclear Turbine Oil 32	Syncon 32	Hydroclear Turbine Oil 68	Syncon 68	Hydroclear AW Hyd. Fluid 150	N/A
ExxonMobil	Teresstic 32	Synnestic 32	Teresstic 68	Synnestic 68	Teresstic 150	Synnestic 150
ExxonMobil	DTE Oil Light	SHC 624	DTE Oil Heavy Medium	SHC 626	DTE Oil Extra Heavy	SHC 629
Pennzoil Co., Inc	Pennzbell TO 32	Pennzbell SHD 32	Pennzbell TO 68	Pennzbell SHD 68	Pennzbell TO 150	Pennzbell SHD 150
Phillips Petroleum Co.	Magnus 32	Syndustrial "E" 32	Magnus 68	Syndustrial "E" 68	Magnus 150	N/A
Shell Oil Co.	Tellus 32	Tellus HD Oil AW SHF 32	Tellus 68	Tellus HD Oil AW SHF 68	Tellus 150	N/A
Texaco Lubricants Co.	Regal 32	Cetus PAO 32	Regal 68	Cetus PAO 68	Regal 150	N/A

Table 5
Approximate Oil Sump Capacities

Frame Size	Motor Type Designation (See Motor Nameplate)	Oil Capacity (Quarts)	
		Upper Bearing	Lower Bearing
180 - 280	AU, AV-4	Grease	Grease
180 - 280	AV		
320 - 440	RV		
320 - 360	RV-4, RU	3	
400	RV-4, RU	5	
440	RV-4 (2 pole)	17	
	RV-4, RU (4 pole & slower, w/ang contact thrust brg.)	6	
	(4 pole & slower, w/ spherical thrust brg.)	4	
180 - 440	TV-9, TV, LV-9, LV	Grease	
180 - 360	TV-4, TU, LV-4, LU		
400	TV-4, TU, LV-4, LU	6	
440	TV-4, TU, LV-4, LU	5	
449	JU, JV-4	22	
	HU, HV-4	12	
	JV-3, JV, HV	Grease	
5000	HV, EV, JV, RV	Grease	
	RU, RV-4	30	
	HU, HV-4 (4 pole & slower)	12	
	HV-4 (2 pole only)	20	
	EU, JU, EV-4, JV-4	22	5
5800	HU, HV-4	24	3
	EU, JU, EV-4, JV-4	37	4
6800	HU, HV-4	70	3
	HV (Bow Thruster)	Grease	Grease
	HV (Other Than Bow Thruster)	70	3
8000	RU, RV-4	70	6
	RV	Grease	Grease
9600	RU, RV-4	64	13
	RV	Grease	Grease

EMERSON
Motor Technologies

Standard

Paint

Specification

For

EM Gray

DR#587-12765/MENA
REV. 9/23/94-BRB
REV.1/12/95-BRB
REV.4/4/96-RIH
REV.3/30/98-KWF
REV.4/21/98-RIH
REV.9/25/02-DH

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1.0 Scope

Commercial Industrial Motors (CIM) in Mena, Arkansas (formerly U.S. Electrical Motors) has selected the Hi-Solids enamel paint from "Valspar Corp." for its superior corrosion resistance and durability. The paint also has excellent resistance to various chemicals. This specification covers surface preparation and application of protective coating on motors built in the Mena, Arkansas facility.

2.0 Unpainted Surfaces

The following surfaces will not require protective coating:

Anodized Aluminum	Grounding Pads
Brass	Machined Surfaces
Bronze	Motor Leads
Chromium Plated Metals	Porcelain Enamel Finishes
Copper	Rubber
Galvanized Steel	Stainless Steel
Glass	Vacuum Pressure Impregnated Parts

3.0 Surface Preparation (Cast Iron & Steel)

A. The foundries are required to snag, remove all sand and slag from castings.

B. Prime paint all castings in-plant if they have not been primed by the foundry. Primer is to be "Valspar Corp." gray oxide primer Part No. 999-712 or water reduced gray oxide Primer Part No. 999-711. Film Thickness: 1 to 3 mils

C. All parts are to be cleaned prior to priming or finish painting as follows:

1. If parts are dirty – wash and rinse in parts washer.
2. If parts are oily or greasy – clean in a phosphate dip system and rinse in parts washer.
3. If parts are rusty – grit blast to commercial grade.
4. Welded fabricated assemblies – power wire brush, sand or grind all welds; then, degrease in the phosphate dip system and rinse in parts washer.
5. Thoroughly dry all parts prior to priming or finish painting. Primer must be applied immediately after cleaning and drying process.

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4.0 Cast Aluminum and Fiberglass Parts

Priming is not required on cast aluminum or fiberglass parts. Oxidation must be removed from aluminum parts with a solvent prior to finish painting. Fiberglass parts (canopy caps) are received with a white pigment in the fiberglass.

5.0 Motor Assembly

After assembling the motor, there may be surfaces that require priming or touch-up prior to final painting. These surfaces are bracket-to-frame register fits, outlet box pads, etc. Spray cans of primer are provided to allow motor assemblers to prime paint unfinished surfaces with two coats of primer. Sufficient drying time must be allowed between primer coats. If surfaces are oily, wash with clean paint thinner using a clean rag to prevent contamination of other surfaces.

6.0 General

A. Finished coating shall not be applied to wet or damp surfaces.
B. All coatings shall be applied in a conscientious manner and in accordance with the written application instructions of the coating manufacturer.
C. Re-application time between coats shall be in accordance with the coating manufacturer's recommendation corresponding to the conditions of temperature and humidity.
D. Hardware trim and other items not requiring coating may be removed as required for proper application of coatings. Such items shall be replaced after completion of work.
E. The dry film thickness of each coat, and of the entire system, shall follow the coating manufacturer's recommendation and this specification. The number of coats specified shall be a minimum number of coats to achieve the specified film thickness.
F. Coverage rates, as calculated by the coating manufacturer, shall be considered as the maximum allowable.
G. All spraying equipment shall be maintained in good working order, with daily inspection, and shall be in conformity with the coating manufacturer's most recent application specification.

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7.0 Finish Top Coating

All motor products must be clean and free of any dirt, oil or grease on the primed surface prior to finish painting. Except where otherwise specified, thinners shall not be used. Motors will be painted with one coat unless otherwise noted. Film thickness: 2 to 4 mils.

8.0 Final Finish Inspection

Visual inspection of completed work shall be performed on the finished motor by the Assembly End of Line Inspector. The final surface finish is to be in accordance with industry standards for comparable equipment. Any surfaces found in violation of this specification will be rejected and will require rework. The final finish top coat shall adhere to CIM Quality standards for appearance, adhesion and customer specifications.

9.0 Material Identification

A. Vendor Primer

USEM P/N 999712 GRAY OXIDE PRIMER
VALSPAR CORP.
#5410-E-10009
ALKYD-HI SOLIDS, FAST DRY

USEM P/N 999711 WATER REDUCED GRAY OXIDE PRIMER
VALSPAR CORP.
#5424-E-10035A
ALKYD-HI SOLIDS

B. Standard Finish Paint

USEM P/N 138538 EM GRAY 3.5 VOC H/S ENAMEL
VALSPAR CORP.
AAA1024 DURASPAR 430
ALKYD-HI SOLIDS, FAST DRY
COLOR: BLUE-GRAY, PANTONE PMS 433C

Valspar

TECHNICAL DATA

Product Line:	**Duraspar 430**
Product Number:	**AAA1024**
Product Description:	**EM Gray 3.5 VOC H/S Enamel**

Physical Properties:

Viscosity (#2 EZ Zahn @ 77F):	30-35 seconds
Weight Per Gallon (Theoretical):	9.44 lbs./gallon
Solids by Weight (Theoretical):	58.59%
Solids by Volume (Theoretical):	44.33%
VOC:	3.25 lbs./gallon maximum
HAPs Content:	.0894 lbs./solid gallon

Application Recommendations:

Substrate/Pretreatment:	Steel / Iron Phosphate
Reduction:	As needed
Reduction Solvent:	Acetone
Application:	Spray
Clean-Up Solvent:	Ketones
Cure Cycle:	Air Dry

Film Properties:

Dry Film Thickness:	0.8 – 1.2 mils
Gloss (60 degrees):	80 minimum
Coverage @ 1 mil DFT:	711 sq. ft./gallon

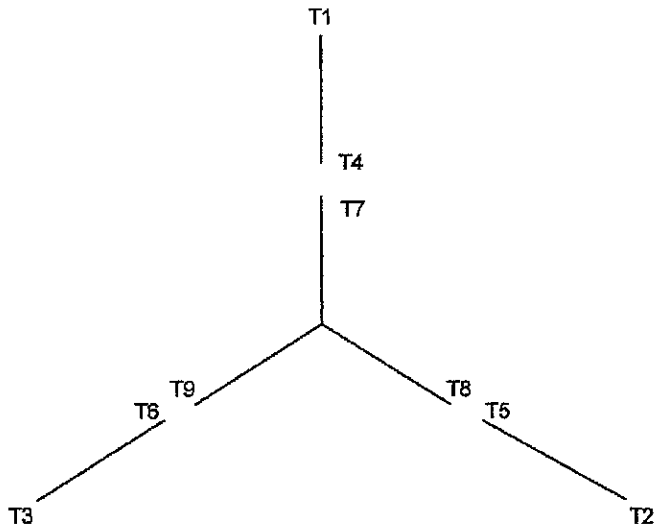
Issue Date: September 2002

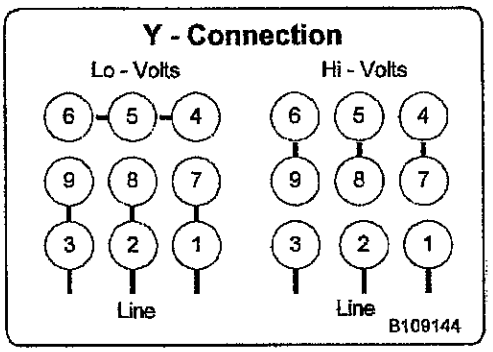
The Valspar Corporation, Minneapolis, MN **1-800-328-8044**

B109144

Motor Wiring Diagram

9 Lead, Dual Voltage (WYE Conn.)





To reverse direction of rotation interchange connections L1 and L2.

Each lead may have one or more cables comprising that lead.
In such case each cable will be marked with the appropriate lead number.

Connection Plate: B109144
Connection Decal: 344136