ADDENDUM #3

Design-Build Services for Wastewater Treatment Facility Improvements

Peachtree City Water and Sewerage Authority
1127 Hwy 74 South, Peachtree City, GA 30269

Proposals Due:	**March 14, 2024 @ 5:00p**
Pre-Proposal Meeting:	**January 25, 2024**
RFP #:	2024-100
Date:	March 6, 2024

INCORPORATE CHANGES INTO THE REQUEST FOR PROPOSALS AS DESCRIBED BELOW AND ATTACHED TO THIS ADDENDUM:

1. Question: *Line Creek: Is there any associated cost to contractor for using reject pond as described in Addendum 1 response? Does the facility have capability to re-route flows back to plant?*

   Answer: There is no associated cost to the contractor for using the reject pond to store effluent not meeting permit requirements, other than the cost of bypass pumping around the UV channel to the effluent pump station. The effluent pump station can pump directly to the reject storage pond. Reject pond effluent is piped to one of the facility's two influent pump stations and is pumped back to the headworks.

2. Question: *Rockaway: Record drawings show 24" tee and valves upstream of the existing disk filter facility, with piping continuing to abandoned chlorine contact facility. Do those valves currently exist, and are they available for use by the contractor during construction?*

   Answer: The tee and valves exist, but the chlorine contact chamber has been removed, and the piping to the chamber has been plugged. These valves may be used during construction if needed for bypass.

3. Question: *Both: Are there shop drawings or other data associated with the UV channel level control devices?*

   Answer: See the UV system shop drawings attached to this addendum. The Trojan O&M manual section detailing the level control devices is also attached to this addendum for reference.

4. Question: *Both: What are salvage procedures or requirements for all removed equipment?*

   Answer: All removed equipment will be retained by Peachtree City WASA. Equipment shall be removed in a manner as to not damage the components, and placed in a location on-site as directed by Peachtree City WASA.

5. Question: *Line Creek: RFP includes scope to 'repair or replace' existing mechanical screen. Is there a scope available of what requires repair?*

   Answer: In the option that the existing mechanical bar screen at Line Creek is repaired rather than replaced, the scope should include replacement of all wearable components, summarized as the following:

   - Replace brush drive shaft bearings.
   - Replace screen drive shaft bearings.
   - Replace screen belt chains.
   - Replace bottom guide rails.
   - Replace lower upstream return guide rails.
   - Replace washpress wear bar.
   - Replace washpress brushes.
   - Replace washpress shaft seal packing.

   The Parkson screen O&M manual has been attached for reference.

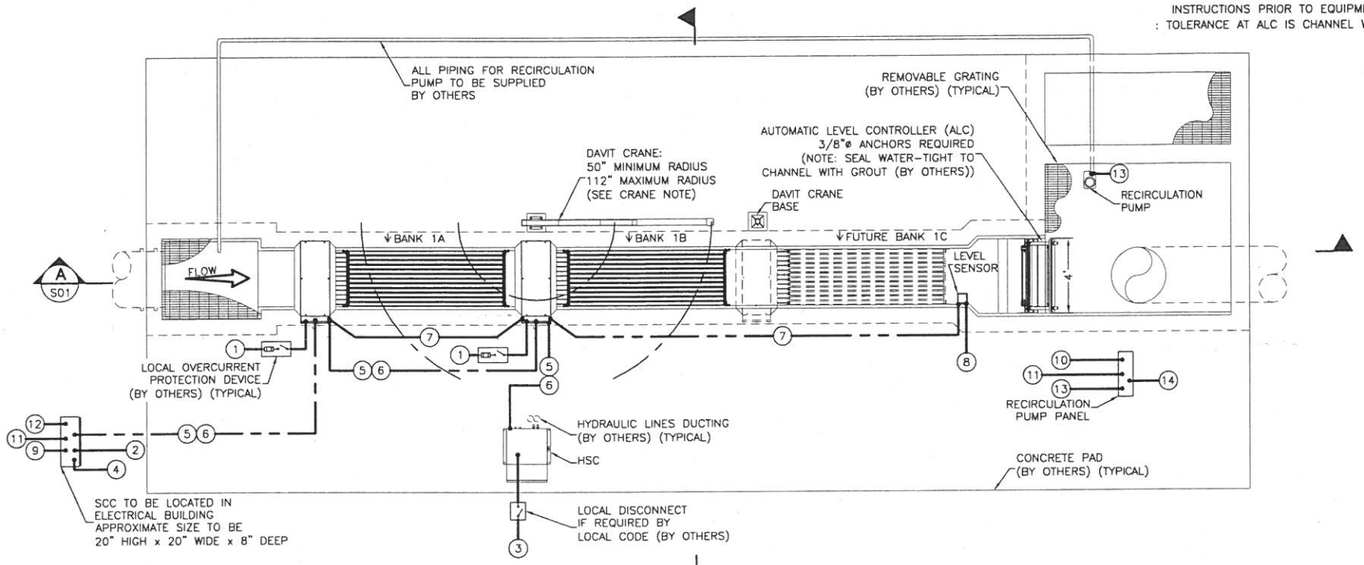
Trojan UV Disinfection System Shop Drawings

DEVIATIONS:

: ONLINE UVT AND SAMPLER SHOWN IN DRAWING 222-M-1.0 NOT REQUIRED BY TROJAN.

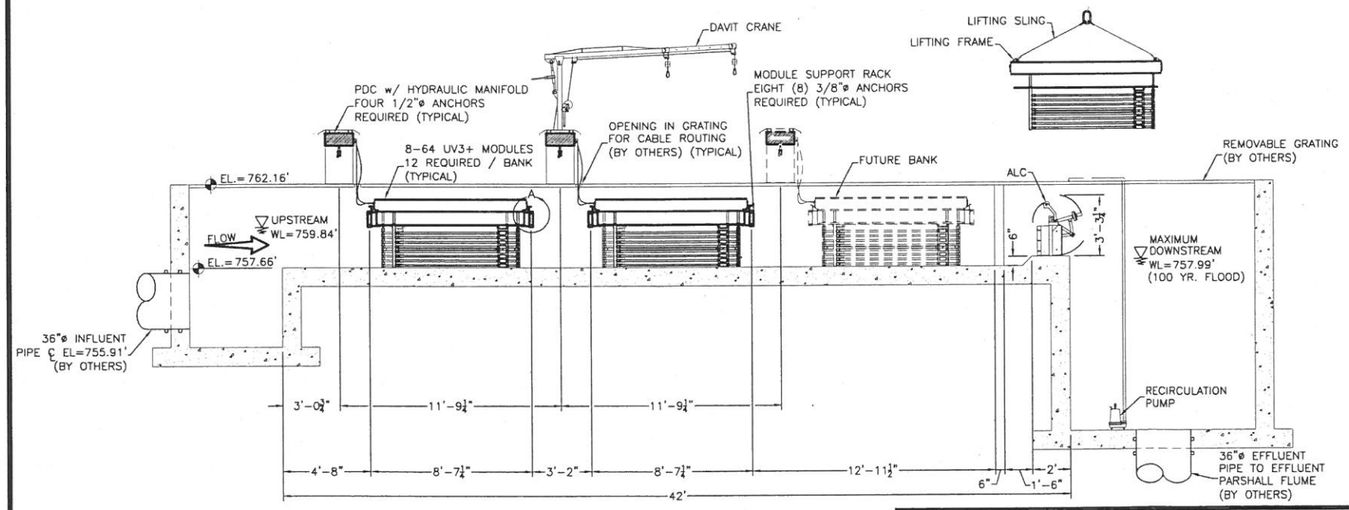
NOTES:

: DO NOT SLOPE CHANNEL FLOOR.
: CHANNEL WIDTH & DEPTH MUST BE KEPT WITHIN A TOLERANCE OF + OR - ¼".
: ANCHOR BOLTS ARE NOT SUPPLIED BY TROJAN TECHNOLOGIES INC.
: SYSTEM CONDUIT, WIRING, DISTRIBUTION PANELS & INTERCONNECTIONS BY OTHERS.
: ELECTRICAL REQUIREMENTS SHOWN ARE TO SUPPLY TROJAN UV EQUIPMENT ONLY. ELECTRICAL INRUSH FACTOR TO BE ADDED AS PER LOCAL CODE.
: HYDRAULIC HOSE SUPPLIED BY OTHERS (COMPLETE WITH SPECIFICATION).
: HOSE SPECIFICATION TO BE SAE 100RI, 1/2"ø, WEATHERHEAD MODEL H017 OR EQUAL.
: HOSE CONNECTIONS MUST HAVE MALE ENDS & MUST BE ABLE TO CONNECT TO THE HSC WITH 1/2" NPT FEMALE PORTS & MANIFOLD WITH 1/2" NPT FEMALE PORTS. APPROPRIATE ORIENTATION & REQUIREMENTS FOR SWIVEL ENDS OR UNIONS TO BE DETERMINED BY OTHERS.
: REMOVABLE GRATING SECTIONS SHALL BE EASILY REMOVED BY ONE PERSON. MAXIMUM WEIGHT OF THE SECTIONS SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF THE APPLICABLE JURISDICTION.
: CONTRACTOR TO REVIEW ALL TROJAN TECHNOLOGIES INC. INSTALLATION INSTRUCTIONS PRIOR TO EQUIPMENT INSTALLATION.
: TOLERANCE AT ALC IS CHANNEL WIDTH +1".



PLAN VIEW

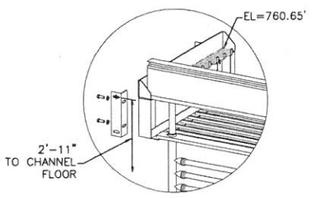
SCALE:AS SHOWN



A SECTION

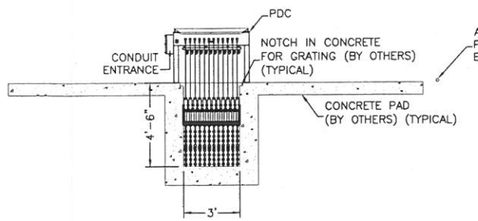
A S01 SCALE:AS SHOWN

NOTE: SUBMERSIBLE PUMP NOT SHOWN FOR CLARITY.



DETAIL A

SCALE: NOT TO SCALE



B SECTION

B S01 SCALE:AS SHOWN

NOTE: SCC, HSC, DAVIT CRANE, CRANE BASE AND GRATING NOT SHOWN FOR CLARITY.

TROJAN UV3000™ PLUS
EQUIPMENT INTERCONNECTIONS

No.	DESCRIPTION	FROM	TO
1	POWER DISTRIBUTION CENTER (PDC) POWER SUPPLY 480Y/277V, 3 PHASE, 4 WIRE + GROUND 24.5 kVA/PDC POWER DRAW 29.5 AMPS MAXIMUM CURRENT/PHASE	DISTRIBUTION PANEL (DP) (BY OTHERS) (NOT SHOWN)	PDC
2	SYSTEM CONTROL CENTER (SCC) POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROUND, 10 AMPS	DP (BY OTHERS) (NOT SHOWN)	SCC
3	HYDRAULIC SYSTEMS CENTER (HSC) POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROUND, 30 AMPS	DP (BY OTHERS) (NOT SHOWN)	HSC
4	FLOW METER 4-20 mA, DC ANALOG INPUT (BY OTHERS)	FLOW METER PANEL (NOT SHOWN)	SCC
5	GROUND LINK 14 AWG TYPE TWH STRANDED	SCC	HSC THRU PDC (DAISY CHAINED)
6	SERIAL COMMUNICATION LINK (RS485) 1 SHIELDED TWISTED PAIR (24 AWG)	SCC	HSC THRU PDC (DAISY CHAINED)
7	LOW WATER LEVEL DETECTION 2- 14 AWG TYPE TWH STRANDED	LEVEL SENSOR	PDC (DAISY CHAINED)
8	LEVEL SENSOR POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROUND, 5 AMPS	DP (NOT SHOWN) (BY OTHERS)	LEVEL SENSOR
9	TELEPHONE LINE (SUPPLY BY OTHERS)	LOCAL SUPPLY (NOT SHOWN)	SCC
10	RECIRCULATION PUMP PANEL 480V, 3 PHASE, 3 WIRE + GROUND, 60Hz, 6 AMPS	DP (BY OTHERS) (NOT SHOWN)	RECIRCULATION PUMP PANEL
11	SUBMERSIBLE PUMP CONTROL 2 - 14 AWG TYPE TWH STRANDED	SCC	RECIRCULATION PUMP PANEL
12	DISCRETE DRY CONTACT MAJOR/MINOR ALARM INDIVIDUAL ON/OFF BANK STATUS	SCC	PLANT SCADA (BY OTHERS) (NOT SHOWN)
13	SUBMERSIBLE PUMP POWER 480V, 3 PHASE, 3 WIRE + GROUND, 60Hz, 3.6 AMPS (SUBMERSIBLE CABLE) PUMP POWER CABLE (BY TROJAN)	RECIRCULATION PUMP PANEL	RECIRCULATION PUMP
14	LOW LEVEL SIGNAL 2 - 14 AWG TYPE TWH STRANDED	PLANT SCADA (BY OTHERS) (NOT SHOWN)	RECIRCULATION PUMP PANEL

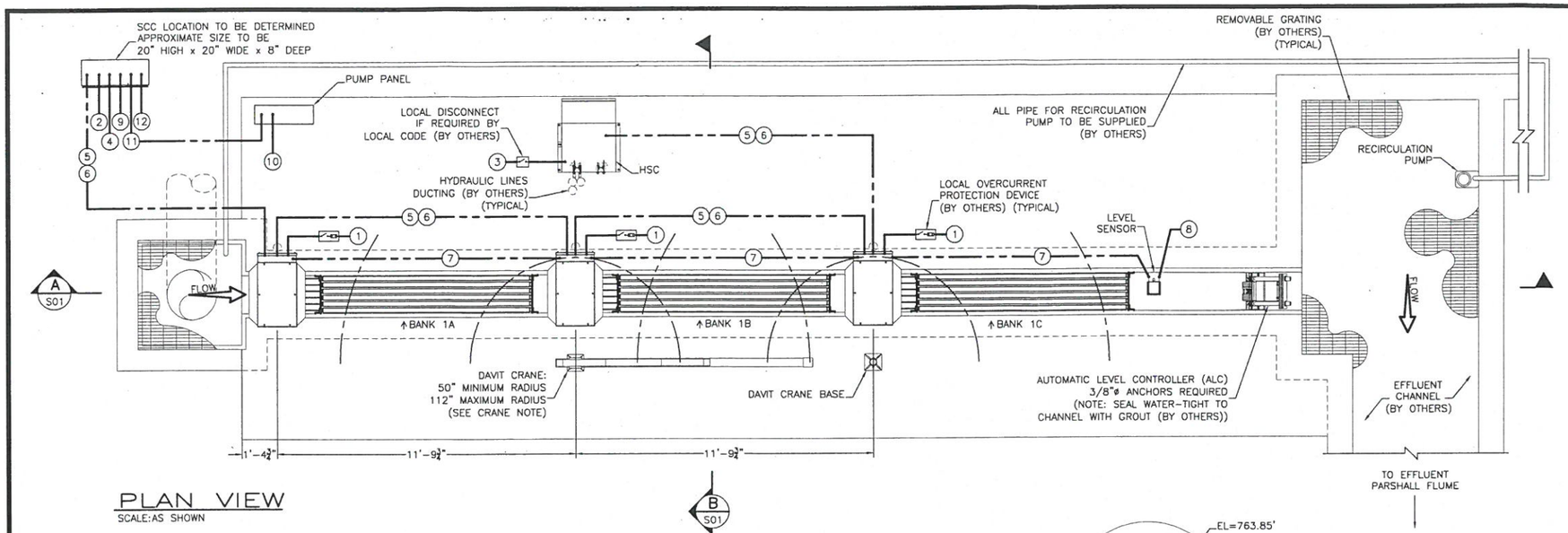
DESIGN CRITERIA		
	PEAK FLOW	10.0 MGD
	U.V TRANSMISSION AT 253.7 nm	60 %
	SUSPENDED SOLIDS	20 mg / l
	DISINFECTION STANDARD	200 FC / 100ml

Trojan Technologies Inc.

DESCRIPTION: LAYOUT, UV3+ ROCKAWAY WWTP GA

DRAWN BY : SAH/CAR	DATE : 03AP09
CHECKED BY : LZ	DATE : 03AP22
APPROVED BY : MP	DATE : 03AP24
SCALE (11x17) : 1/8"=1'-0"	LOG NUMBER : N/A

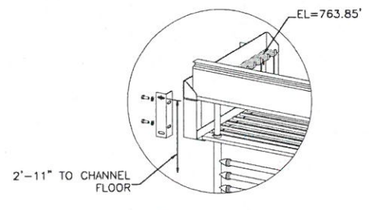
QUOTE NO. LDB1285
PROJECT NO. 510247
DWG NO. S01 REV. C



PLAN VIEW

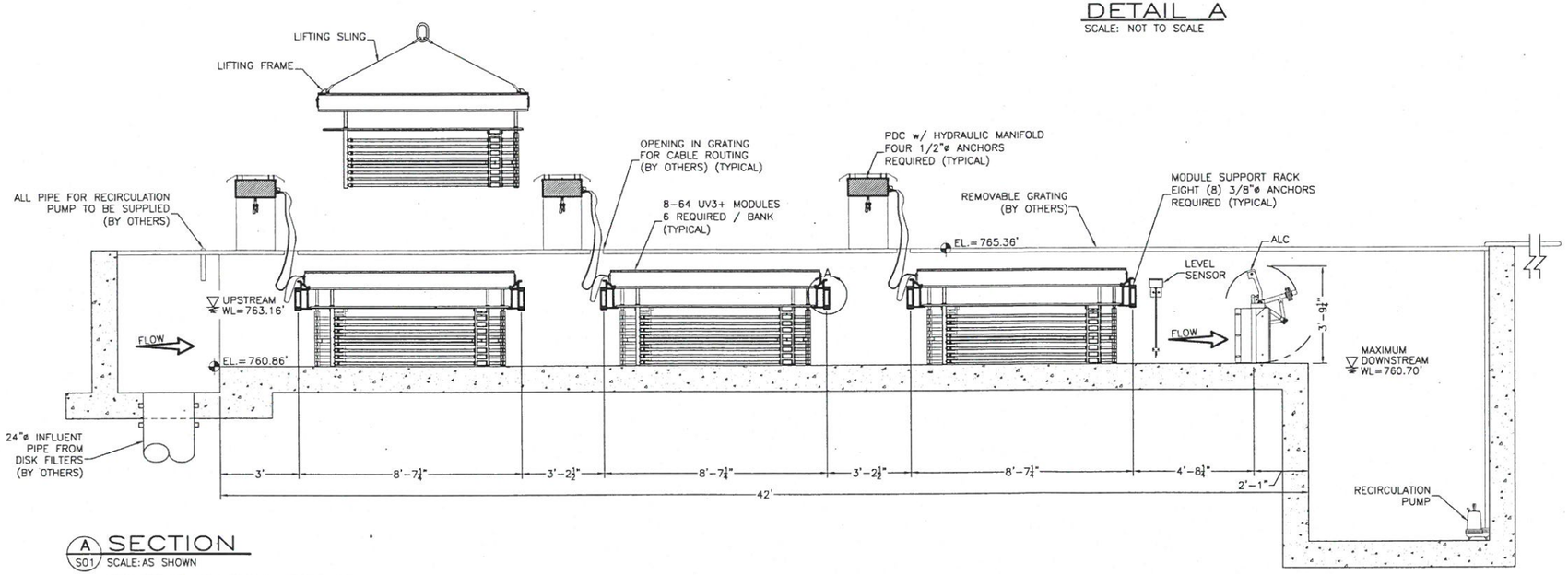
SCALE: AS SHOWN

CRANE NOTE: BASE INSTALLATION IS THE CONTRACTOR'S RESPONSIBILITY. TROJAN RECOMMENDS CONSULTING A CIVIL ENGINEER OR OTHER QUALIFIED PROFESSIONAL.



DETAIL A

SCALE: NOT TO SCALE



A SECTION

S01 SCALE: AS SHOWN

NOTE: SCC AND HSC NOT SHOWN FOR CLARITY.

DEVIATIONS:

: CONCRETE ELEVATIONS DRAWN TO MATCH THOSE ON DRAWING 328-M-4.0 NOT AS SHOWN ON DRAWING 328-S-4.0.
: ONE DAVIT CRANE TO BE SUPPLIED ALONG WITH A SECOND BASE, NOT TWO DAVIT CRANES A SHOWN ON DRAWING 328-M-1.0.

OK

TROJAN UV3000™PLUS
EQUIPMENT INTERCONNECTIONS

No.	DESCRIPTION	FROM	TO
1	POWER DISTRIBUTION CENTER (PDC) POWER SUPPLY 480Y/277V, 3 PHASE, 4 WIRE + GROUND 12.3 kVA/PDC POWER DRAW 14.8 AMPS MAXIMUM CURRENT/PHASE	DISTRIBUTION PANEL (DP) (BY OTHERS) (NOT SHOWN)	PDC
2	SYSTEM CONTROL CENTER (SCC) POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROUND, 10 AMPS	DP (BY OTHERS) (NOT SHOWN)	SCC
3	HYDRAULIC SYSTEMS CENTER (HSC) POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROUND, 30 AMPS	DP (BY OTHERS) (NOT SHOWN)	HSC
4	FLOW METER 4-20 mA, DC ANALOG INPUT (BY OTHERS)	FLOW METER PANEL (NOT SHOWN)	SCC
5	GROUND LINK 14 AWG TYPE TWH STRANDED	SCC	HSC THRU PDC (DAISY CHAINED)
6	SERIAL COMMUNICATION LINK (RS485) 1 SHIELDED TWISTED PAIR (24 AWG)	SCC	HSC THRU PDC (DAISY CHAINED)
7	LOW WATER LEVEL DETECTION 2- 14 AWG TYPE TWH STRANDED	LEVEL SENSOR	PDC (DAISY CHAINED)
8	LEVEL SENSOR POWER SUPPLY 120V, 1 PHASE, 2 WIRE + GROUND, 5 AMPS	DP (NOT SHOWN) (BY OTHERS)	LEVEL SENSOR
9	TELEPHONE LINE (SUPPLY BY OTHERS)	LOCAL SUPPLY (NOT SHOWN)	SCC
10	RECIRCULATION PUMP PANEL 480V, 3 PHASE, 3 WIRE + GROUND, 60HZ 6 AMPS	DP (BY OTHERS) (NOT SHOWN)	PUMP PANEL
11	SUBMERSIBLE PUMP CONTROL 2- 12 AWG TYPE TWH STRANDED	SCC	PUMP PANEL
12	DISCRETE DRY CONTACT MAJOR/MINOR ALARM INDIVIDUAL ON/OFF BANK STATUS	SCC	PLANT SCADA (BY OTHERS) (NOT SHOWN)

NOTES:

: DO NOT SLOPE CHANNEL FLOOR.
: CHANNEL WIDTH & DEPTH MUST BE KEPT WITHIN A TOLERANCE OF + OR - ¼".
: ANCHOR BOLTS ARE NOT SUPPLIED BY TROJAN TECHNOLOGIES INC.
: SYSTEM CONDUIT, WIRING, DISTRIBUTION PANELS & INTERCONNECTIONS BY OTHERS.
: ELECTRICAL REQUIREMENTS SHOWN ARE TO SUPPLY TROJAN UV EQUIPMENT ONLY. ELECTRICAL INRUSH FACTOR TO BE ADDED AS PER LOCAL CODE.
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: HOSE SPECIFICATION TO BE SAE 100RI, 1/2"ø, WEATHERHEAD MODEL H017 OR EQUAL.
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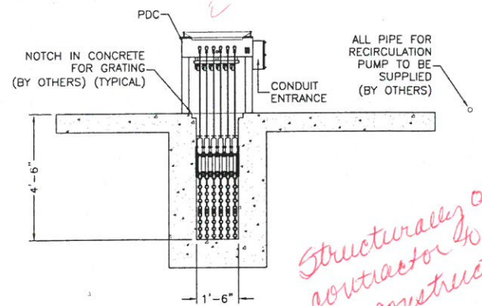


B SECTION

S01 SCALE: AS SHOWN

NOTE: SCC, HSC AND DAVIT CRANE NOT SHOWN FOR CLARITY.

Structurally OK
contractor to coordinate
in construction
D.K.
2-27-03

DESIGN CRITERIA		
	PEAK FLOW	5.00 MGD
	U.V TRANSMISSION AT 253.7 nm	60 %
	SUSPENDED SOLIDS	5 mg / l
	DISINFECTION STANDARD	23 FC / 100ml

Trojan Technologies Inc.

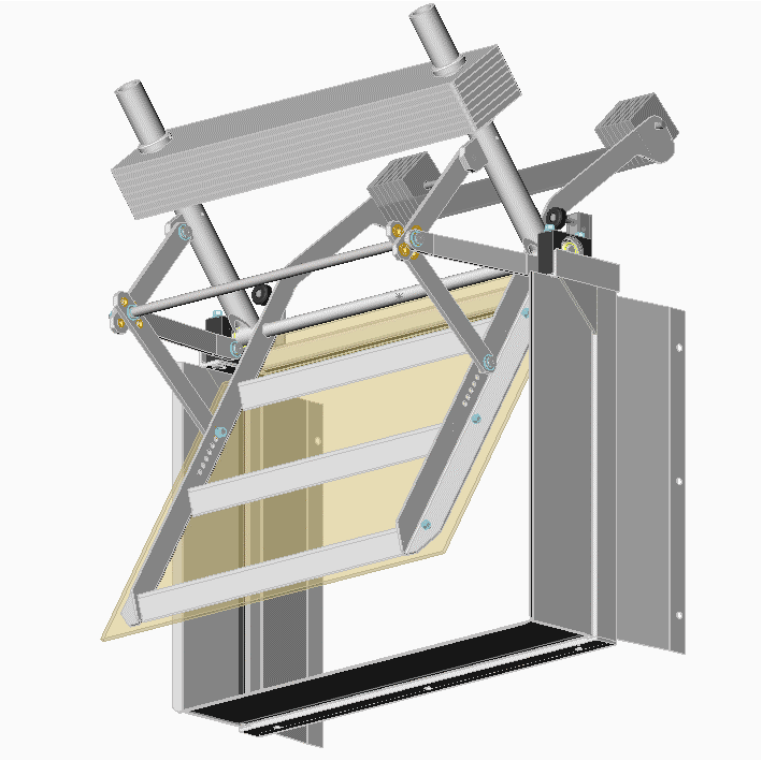
DESCRIPTION: LAYOUT, UV3+ LINE CREEK GA

DRAWN BY : SAH/CAR	DATE : 03FE11	QUOTE NO.	LDB1288B
CHECKED BY :	DATE : 03FE14	PROJECT NO.	510248
APPROVED BY :	DATE : 03FE17	DWG NO.	S01
SCALE (11x17) : 3/16" = 1'-0"	LOG NUMBER : N/A	REV.	B

Trojan UV Disinfection System Automatic Level Control Device Specs

Chapter 8

WATER LEVEL CONTROL



8 WATER LEVEL CONTROL

8.1 Automatic Level Controller (ALC)

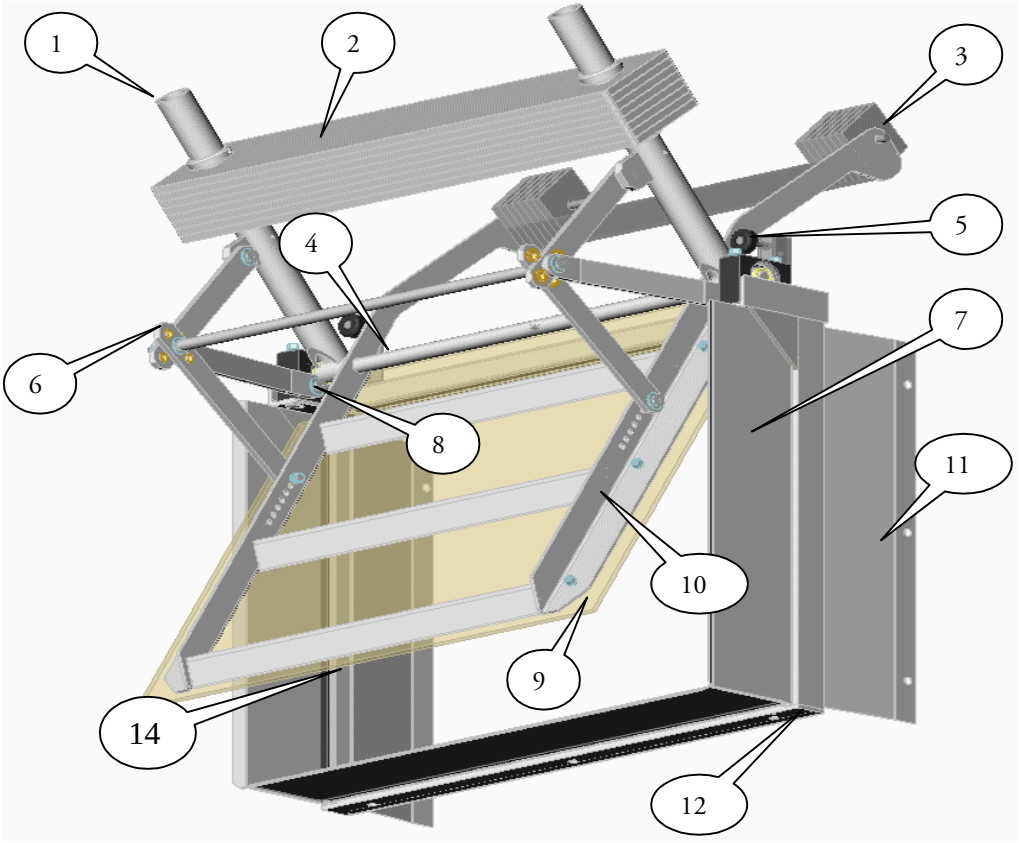
Description

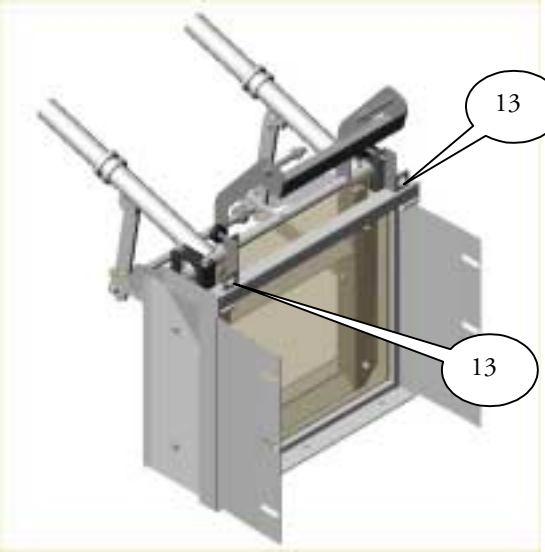
The Automatic Level Controller (ALC) is used to maintain a pre-set water level independent of the upstream flow. Maintaining a pre-set water level is necessary to ensure the layer of water over the lamps is disinfected. It also ensures the lamps remain submerged.

The ALC is positioned in the effluent channel downstream of the UV equipment. For location details see the Layout Drawing Appendix.

The ALC appears to be a single pivot point weighted level controller but it is actually a dual pivot point weighted level controller. It accomplishes this using a set of linkages, which tie the primary weight arms to the flap. This configuration allows the ALC to pivot to the necessary location to allow for accurate level control through a wide range of flows. The ALC is situated on the downstream side of the disinfection equipment and spans the width of the channel, providing the required effluent level in the UV channel.

The hydrostatic pressure behind the ALC causes it to open and the effluent flows out underneath the flap. The flow restriction imposed by the ALC maintains the minimum effluent depth that is required, downstream of the UV equipment.





Item	Description
1	Primary Weight Arm
2	Primary Weights
3	Flap Counter Weights
4	Primary Pivot Shaft
5	Roll Over Bumper
6	Tie Linkages
7	Downstream Baffling
8	Secondary Pivot Shaft
9	Flap
10	Flap Frame
11	Inlet Side Support
12	Frame
13	Lifting Lugs
14	Sealing Gasket

The ALC consists of a stainless steel frame bolted to the floor of the channel. On this frame is mounted the primary pivot shaft. The shaft rotates atop the frame and is welded to the flap frame. The Flap frame is used to hold the Flap in place, and also gives the Flap the necessary support required to hold back the effluent. The flap spans the width of the channel and is available in three depths, which produce the following water depths (12"[300mm], 18"[460mm], & 24"[600mm]). Also as part of the flap frame, there is the flap counterweight support. The position of this support, along with the flap counterweights, make the flap perform as though it were completely weightless. This now allows the primary weight arms, along with the Primary weights, to act as the only opposing (or closing moment) thus achieving accurate level control. However, this could not be achieved without the use of a series of six linkage bars and secondary pivot shaft, which all tie into the primary weight arms. All this, allows the weights to act in the right place at the right time, throughout the pivot range that the ALC flap rotates. Thus giving accurate level control throughout a wide range of flows.

As effluent flow increases or decreases, the flap adjusts by rotating further open or closed. This is as a result of the force exerted by the passing effluent onto the flap. This keeps the effluent level constant regardless of flow rate.

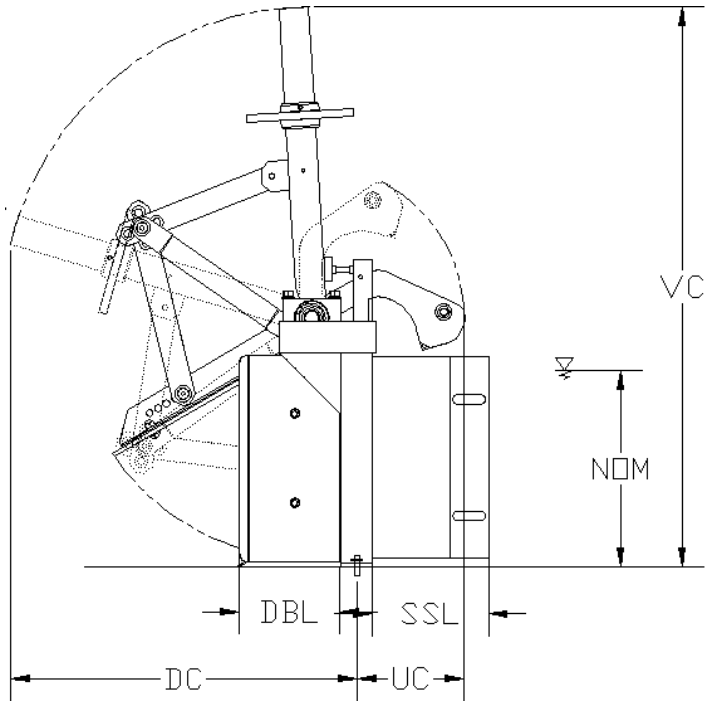
Trojan personnel or representatives adjust the position of the linkages, counterweights, and primary weights at the time of system start up so the desired level of effluent is maintained.

CAUTION

Do not adjust the ALC once Trojan Personnel have set up the equipment.

The ALC is designed to operate in a "free-discharge" condition without any backwater pressures. The presence of backwater pressure will tend to force the ALC into the closed position, which is detrimental to its designed operation. Therefore the maximum water level that can be downstream of the ALC at any time is the top of the ramp or floor upon which the unit is anchored, minus ~ 10% of the nominal fluid depth. (Therefore if the nominal fluid depth were 24"[600mm] then the maximum water level would be the top of the ramp or floor minus 2"[50mm]).

ALC Working Envelope											
Nominal Fluid Depth		Vertical Clearance		Upstream Clearance		Downstream Clearance		Side Support Length		Downstream Baffle Length	
NOM		VC		UC		DC		SSL		DBL	
[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]
12	300	33.5	850	10	250	21	530	10	250	7	180
18	460	39.5	1000	14	360	25	640	10	250	7	180
24	600	45.5	1160	12.5	320	31	790	10	250	7	180



The ALC headloss is calculated using a proprietary computer analysis program developed at Trojan Technologies Inc. Contact Trojan for headloss estimates.

CAUTION

The ALC is not intended to function in no flow conditions. A recirculation pump or other level control device is required if periods no flow are expected.

Specifications

Item	Value
Frame	Constructed of stainless steel. It is bolted to channel floor using ½" (12.7mm) holes on

	the bottom. The Inlet Side Supports which are welded to the frame, use $^3/_8$" (9.5mm) bolts through ½" (12.7mm) holes and are located on each side of the frame. The total number of holes depends on the channel width and height of frame.
Flap Frame	Constructed of stainless steel. It is formed as a smaller frame onto which a lexan flap is attached. A series of linkages tie into the primary weight arm insuring that it correctly positions the Primary Weights as it rotates; all while the counterweight arm acts as a balance to counteract the initial weight of the Flap. The number of weights used determines gate force and speed.
Galvanized weights	Fabricated from galvanized steel. Either 6" (150mm), 8"(200mm), or 10"(250mm) wide dependant on controller depth and ½" (12mm) or ¼" (6mm) thick. Length varies depending on the width of the channel.

? HOW TO INFO

Maintenance

The only maintenance required for an ALC is verification that there is no debris caught in the flap.

Regular cleaning (e.g., spray washing) of the gate is recommended to remove algae.

CAUTION

There should never be anything welded to or placed on the ALC unit. Doing so will affect the operation as well as the water level it was set to maintain.

Parkson Screen O&M Manual

04/11

AQUA GUARD PF™ FILTER SCREEN
MODEL AG-PF

INSTALLATION OPERATION AND MAINTENANCE MANUAL

PARKSON
1401 W. CYPRESS CREEK ROAD
FORT LAUDERDALE, FL 33309-1969 • USA
PHONE: 954-974-6610
PARTS AND SERVICE: 1-888-PARKSON
www.parkson.com
services@parkson.com

Dated: August 31, 2016

PREFACE

THE OPERATING AND MAINTENANCE PROCEDURES OUTLINED IN THIS MANUAL ARE INTENDED AS GUIDELINES TO ASSIST THE OPERATING PERSONNEL IN THE DAY-TO-DAY OPERATION AND MAINTENANCE OF THE PARKSON UNIT OR EQUIPMENT. OPERATING PERSONNEL SHOULD ALWAYS FOLLOW PROPER SAFETY PROCEDURES IN ACCORD WITH BOTH INDUSTRY SAFETY STANDARDS AND THEIR OWN COMPANY SAFETY POLICIES WHEN PROCEEDING WITH OPERATION, MAINTENANCE AND REPAIR OF THE EQUIPMENT. THIS MANUAL IS NEITHER DESIGNED NOR INTENDED AS A SUBSTITUTE FOR SAFE OPERATING PROCEDURES WHICH MUST BE FOLLOWED WHILE IMPLEMENTING THE MAINTENANCE/OPERATION PROCEDURES OUTLINED IN THIS MANUAL. IT IS ASSUMED THAT OPERATION AND MAINTENANCE PERSONNEL ARE QUALIFIED AND EXPERIENCED. THE PRIMARY RESPONSIBILITY FOR SAFETY IN THE OPERATION AND MAINTENANCE OF THE PARKSON UNIT IS WITH THE OWNER-OPERATOR AND THE PERSONNEL CONDUCTING THE MAINTENANCE AND OPERATION.

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SECTION ONE

Aqua Guard PF™ Filter Screen
GENERAL INFORMATION

Safety Practices

⚠ DANGER ⚠

TO PREVENT SERIOUS INJURY OR DEATH:

- **THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND ARE FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.**

- **DO NOT OPERATE THE SCREEN WITHOUT GUARDS AND COVERS IN PLACE. USER IS RESPONSIBLE FOR FURNISHING AND PROPERLY INSTALLING ALL ADDITIONAL SAFETY EQUIPMENT AS NEEDED TO PROTECT OPERATING PERSONNEL NEAR THE SCREEN (E.G., RAILING, GRATING).**

- **KEEP AWAY FROM ALL MOVING PARTS AND DISCHARGE CHUTE DURING OPERATION.**

- **LOCK-OUT/TAG-OUT PROCEDURES MUST BE STRICTLY OBSERVED BEFORE SERVICING OR ADJUSTING ANY PART OF THE SCREEN: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

IN ADDITION TO THE ABOVE, IN ORDER TO AVOID UNSAFE OR HAZARDOUS CONDITIONS, THE FOLLOWING MINIMUM PROVISIONS MUST BE STRICTLY OBSERVED:

- **SYSTEM COMPONENTS ARE HEAVY. USE PROPER LIFTING AND SUPPORT EQUIPMENT WHEN MOVING AND POSITIONING EQUIPMENT. FAILURE TO USE PROPER LIFTING EQUIPMENT AND TECHNIQUES MAY RESULT IN SERIOUS PHYSICAL INJURY AS WELL AS DAMAGE TO THE EQUIPMENT.**

- **WHEN USING SPREADER BARS, CHAINS, OR STRAPS, A MINIMUM LIFTING ANGLE OF 60° (FROM HORIZONTAL) MUST BE USED TO PREVENT DAMAGE TO THE EQUIPMENT.**

- **DO NOT ALLOW PERSONNEL TO STAND UNDER OR NEAR EQUIPMENT AS IT IS BEING LIFTED INTO POSITION.**

- **WHEN INSTALLING THIS UNIT, ALWAYS MAKE SURE THERE IS A LOCKABLE DISCONNECT WITHIN SIGHT OF THE UNIT.**

- **EQUIPMENT SHOULD BE GROUNDED BEFORE START UP.**

- **MAKE SURE ANY ELECTRICAL CONNECTIONS ARE DONE BY QUALIFIED PERSONNEL AND IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS.**

- **THE CONTROL PANELS CONTAIN DANGEROUS HIGH VOLTAGES. SOME CONTROL PANELS CONTAIN VOLTAGES FROM MORE THAN ONE SOURCE. THESE CONTROL CABINETS SHOULD ONLY BE ENTERED AND SERVICED BY A QUALIFIED ELECTRICIAN.**

- **DO NOT OVERLOAD THE EQUIPMENT OR USE IT FOR ANYTHING BUT THE INTENDED USE.**

- **THE SCREEN IS DESIGNED FOR FORWARD FLOW THROUGH THE SCREEN BELT. THE SCREEN MUST NOT BE OPERATED IN BACK FLOW CONDITIONS, AS THIS COULD DAMAGE THE EQUIPMENT. CONFIRM THAT INFLUENT IS FLOWING TOWARD THE DOWNSTREAM SIDE OF THE SCREEN BEFORE OPERATING THE SCREEN.**

- **IN THE EVENT OF A SCREEN JAM, LOCK-OUT AND TAG-OUT THE SCREEN AND BRUSH DRIVES, DETERMINE THE CAUSE OF THE JAM AND REMOVE THE OBSTRUCTION BEFORE ATTEMPTING TO RE-START THE SCREEN. THE FAN ON THE SCREEN DRIVE MOTOR MAY BE TURNED BY HAND IN FORWARD OR REVERSE TO RELIEVE THE TENSION ON THE SCREEN BELT, WHICH MAY HELP TO DISLODGE THE OBSTRUCTION.**

- **SCREEN CONTROLS PROVIDED BY PARKSON CORPORATION ARE NOT SUPPLIED WITH THE PROVISION FOR REVERSING THE SCREEN. IF CUSTOMER-SUPPLIED CONTROLS HAVE THE PROVISION FOR REVERSING THE SCREEN (E.G. THROUGH A REVERSING STARTER OR A VFD), THEN THE SCREEN MUST ONLY BE JOGGED IN REVERSE, AND EXTREME CAUTION MUST BE EXERCISED WHEN DOING SO TO PREVENT DAMAGE TO THE SCREEN OR INJURY TO PERSONNEL. THE SCREEN MUST NOT BE ALLOWED TO RUN CONTINUOUSLY IN REVERSE.**

- **DO NOT OPERATE DAMAGED OR MALFUNCTIONING EQUIPMENT UNTIL NECESSARY ADJUSTMENTS OR REPAIRS HAVE BEEN MADE.**

- **OPERATE AND PERFORM MAINTENANCE IN A MANNER THAT PROMOTES SAFE CONDITIONS. ALWAYS USE THE PROPER TOOLS AND WEAR THE PROPER CLOTHING FOR THE TASK AT HAND. ALWAYS WEAR PROTECTIVE GEAR FOR EYES, FACES, HEAD AND EXTREMITIES WHENEVER WORKING ON THE EQUIPMENT.**

- **AFTER SERVICING THE EQUIPMENT, REPLACE ALL GUARDS AND COVERS, AS WELL AS PROTECTIVE CHANNEL GRATING AND RAILINGS, BEFORE OPERATING THE EQUIPMENT.**

- **THE EQUIPMENT MAY ONLY BE STARTED WHEN IT HAS BEEN DEFINITELY ESTABLISHED THAT NO PERSONNEL ARE WORKING ON IT.**

- **PRACTICE GOOD HOUSEKEEPING. ALWAYS ENSURE THE EQUIPMENT IS KEPT CLEAN AND THE AREA AROUND THE EQUIPMENT FREE OF POSSIBLE HAZARDS.**

- **OBSERVE SAFE HANDLING PRACTICES THAT COMPLY WITH LOCAL AND NATIONAL LAWS AND SAFETY CODE REQUIREMENTS. OBTAIN MATERIAL SAFETY DATA SHEETS ON ALL MATERIALS THAT ARE TO BE HANDLED.**

- **CONTACT WITH MATERIAL PROCESSED OR LUBRICANTS AND OTHER FLUIDS MAY CAUSE INFECTION OR ADVERSE REACTIONS. REPORT ANY CUTS, INJURIES OR EXPOSURE TO SUPERVISOR IMMEDIATELY AND SEEK APPROPRIATE MEDICAL ATTENTION.**

NOTE: **The information supplied in this Manual is based on Parkson Corporation's experience with the installation, operation, and maintenance of this equipment and is intended only as a guide. The methods that are available to you may dictate more practical procedures. The end user holds the final responsibility for the proper installation, operation and maintenance of this equipment.**

Delivery and Inspection

Components that extend beyond the frame of the Aqua Guard PF™ Filter Screen are typically removed for shipping. These items, including drives and support brackets, are shipped loose and must be reassembled on the unit during installation. Controls and miscellaneous control devices such as switches, control valves and level measuring devices, are typically shipped loose, to be installed by the local electrical contractor.

After the equipment has been unloaded, conduct a visual inspection and count of the shipping containers to determine if any shipping damage or loss of equipment occurred in transit. Be careful not to jar crates and/or to puncture crated materials with lifting forks.

NOTE: **You must immediately report, in writing, any damaged or missing parts to the shipping carrier, and contact Parkson Corporation within 48 hours of receipt of the equipment. Purchaser bears the responsibility for the replacement of equipment, which is determined to be damaged or missing after this period.**

To assist in identifying correct quantities and parts, reference the packing list attached to the shipping crate. A purchase order shall accompany any order to Parkson Corporation for replacement of parts, which were damaged during shipment. The purchaser shall direct all shipment damage back charges to the carrier.

Some material supplied for this job has had surface preparation and painting. Any bruises, mars and/or scratches caused by loading and unloading the equipment must be immediately touched up in the field prior to any storage.

NOTE: **Any equipment painted with prime coats only should get additional topcoats (to protect the surface under field storage conditions) within 14 days after receipt. Parkson Corporation will not accept any responsibility for rusting due to material, which has not received additional field topcoats in a timely manner.**

CAUTION

STAINLESS STEEL MATERIAL WILL APPEAR TO RUST IF CONTAMINATED WITH WELD SPATTER, CARBON STEEL DUST FROM A GRINDING WHEEL, OR OTHER AIRBORNE OR WATERBORNE CONTAMINANTS. SPECIAL CARE MUST BE TAKEN TO PROTECT THE UNIT AT ALL TIMES.

Short Term Storage

For storage under 30 days, the equipment (including control panels, shipped loose components that require field assembly, spare parts and any other shipped loose hardware) should be covered, protected from the environment, and well ventilated to prevent moisture build-up on equipment surfaces. The equipment should be stored off the ground in the original shipping crates and away from pooled water.

The equipment should be stored on a sound, low-vibration surface that is isolated from current loads, normal plant traffic and construction activities.

The unit should be isolated from the passage of electrical current during periods of non-operation, in order to avoid false brinnelling and damage to the bearings or other contact surfaces.

Electronic equipment (e.g. transmitters, flow meters, PLCs, control panels, valve actuators, etc.) that is shipped with the equipment must be stored in a climate-controlled environment to prevent exposure to wide temperature variations, high humidity, corrosive agents, and other contaminants that may damage the equipment. Where applicable, electronic equipment should be stored in its original shipping container.

When confirming receipt of all shipped components, identify electronic components and note where these components will be stored if in a different area than the unit.

Long Term Storage

To store the equipment for a period longer than 30 days, first confirm that all short-term storage requirements have been met, and then perform the following applicable procedures:

Confirm that the oil-lubricated stages of the gear reducers are completely filled with oil. Rust preventative oil or circulating oil is recommended, but the normal operating gear oil can be used. All air vents (breather plugs) must be replaced with solid plugs (vents should be attached to the gear reducers for later use when the gear reducer is taken out of storage). Also, confirm that drain holes in the motors are in their lowest position to ensure that any condensation in the motor housing is allowed to drain. A Long Term Storage tag should be attached to the reducers stating that the reducer has been filled with oil for long-term storage. Prior to operation, the oil in the gear reducers must be drained, flushed and refilled with the correct oil to the proper operating level. The grease in grease lubricated gear reducer sections requires changing only if the gear reducers are stored for more than one year.

If the gear reducer and motor are mounted on the unit, confirm that it is safe to turn the screen belt and brush without damaging the unit or endangering personnel. Manually rotate the motor fans by hand for several minutes once per month. This will allow movement of the grease in unit bearings and oil in the gear reducers. Rotating the motor fans will also allow the unit components to rest at a different location to avoid developing flat spots on the unit bearings and seals.

If the gear reducers and motors are stored separately from the unit, manually rotate the motor fans and gear reducer input shafts by hand for several minutes once per month.

When specified in advance, motors can be covered with a protective VCI bag with a moisture barrier pad inside the bag. The bag and barrier must be replaced once per month.

Motor insulation resistance measurements should be taken and recorded using a megohmmeter (Megger) when the motors are placed in storage, and before the motors are placed in service. If the measurement drops below the minimum recommended value, dry the motor windings and retest. If insulation resistance is still below the minimum recommended value, the motor should be repaired or replaced.

Frequency of storage inspections may be increased if the equipment is stored in a climate-controlled area; consult Parkson Corporation for details.

Consult specific product literature provided in Section Nine of this Manual for additional Short and Long Term Storage of components.

Backcharges

Parkson Corporation will not accept any backcharge for modifying, adjusting, servicing or any other work that has not received advanced written authorization. Authorization will be granted only when satisfactory evidence is submitted to indicate the need for such work, and when a price for such work has been agreed upon in writing.

NOTE: **Any backcharge submitted without authorization by Parkson Corporation will be rejected in total.**

Additional Information

For additional information or other installation details contact your local representative or contact Parkson Corporation at (888) PARKSON or in writing at 1401 W. Cypress Creek Road, Fort Lauderdale, FL 33309-6610.

SECTION TWO

Aqua Guard PF™ Filter Screen
TECHNICAL DESCRIPTION

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND ARE FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

Application

The Aqua Guard PF™ Filter Screen is a continuous self-cleaning filter screen designed to remove typical screenings from wastewater flowing in a rectangular channel. The Aqua Guard PF™ Filter Screen can remove screenings with a maximum nominal diameter of 3 inches.

The Aqua Guard PF™ Filter Screen is NOT a trash screen. If large and heavy materials, such as logs and rocks, are expected to be present in the wastewater flow, a coarse trash rack must be installed upstream of the screen. Large and heavy materials may damage the screen.

Each Aqua Guard PF™ Filter Screen is designed to meet the requirements of a project-specific installation. The customer assumes responsibility for correct installation, use and maintenance of this equipment. Parkson Corporation does not authorize use of the equipment in an installation other than that, for which the equipment was designed, nor does Parkson Corporation authorize the use of the equipment for flows and solids loading conditions beyond the range for which the equipment was designed.

Operation

Influent flow is directed onto a continuous screen belt made up of precisely meshed individual perforated panels. Solids larger than the panel perforations are retained on the screen belt while screened flow passes through. Accumulated solids on the screen belt are carried up and out of the channel to a point of disposal on the screen. A spray system and a rotating brush facilitate the removal of solids from the screen belt. Discharged solids are directed through the discharge opening of the screen and into a collection device (such as a receptacle, conveyor or screenings washing unit).

Unit Description

The Aqua Guard PF™ Filter Screen consists of a screen frame, a continuous screen belt and screen drive system, a rotating brush assembly and brush drive system, a screen spray assembly, a front seal assembly, and covers (see Fig 2A).

A controls package is typically supplied with the screen to control the operation of the screen and provide for its safe and proper use. When controls for the Aqua Guard PF™ Filter Screen are not provided by Parkson Corporation, the customer is responsible for providing comparable controls. Current overload protection of the screen drive must be provided to ensure safe operation of the equipment and prevent damage to the equipment.

Optional features may be provided to meet specific application requirements.

Parkson Corporation's scope of supply is detailed on the Equipment Drawings. Utility requirements and component connections, as well as anchoring requirements, are also detailed on the Equipment Drawings. All other components required for a safe and fully functional system are to be supplied and installed by the contractor.

Screen Frame

The screen frame is constructed of stainless steel plate and provides a structural support for all screen components. Lifting lugs are provided on the screen frame for lifting of the screen during testing, installation and servicing of the screen.

Support brackets are secured to the screen frame to mount the screen to the channel and operating floor. Optional pivoting supports may be provided to allow the screen to be pivoted out of the channel for maintenance purposes.

Stainless steel guide rails are mounted on the interior of the screen frame to maintain proper and smooth travel of the screen belt.

Optional supports may be provided to assist in the removal of the screen and brush drives. These supports have been designed to accommodate the weights of the drives, and should not be used for any other purpose.

Continuous Screen Belt and Screen Drive System

The continuous screen belt is made up of perforated screen panels supported and driven by a drive chain on each end of the panels.

Each screen panel is formed from perforated stainless steel sheet and provides a profile that optimizes screenings capture and flow through the screen belt. Each screen panel is properly reinforced to ensure the structural integrity of the panel under expected loading conditions. The profile of the panels ensures proper meshing of adjoining panels throughout the screen belt cycle.

The drive chains are made up of stainless steel sidebars, pins, bushings, rollers, spacers, and snap rings. Screen panels are fastened to the interior sidebars of each chain.

Side plates are positioned between the ends of each screen panel and the drive chains. Each side plate overlaps adjoining side plates to create a shingling effect, which prevents influent flow from bypassing around the ends of the screen panels.

The screen drive system provides the necessary power to drive the screen belt through its cycle under expected loading conditions. A current monitor in the control panel protects the screen by shutting down the motor when an overload condition occurs. The gear reducer is shaft mounted to the screen drive shaft, with a torque arm securing the position of the drive during operation.

The screen drive shaft, along with the screen drive and torque arm, is mounted on adjustable take-up bearings, which allows adjustment of the drive shaft for optimum screen belt tension and smooth travel of the screen belt. The position of the screen drive shaft is factory adjusted during shop testing, but can be further adjusted in the field.

Rotating Brush Assembly and Brush Drive System

A rotating brush is provided to facilitate the removal of screenings from the screen belt.

Straight brush strips with nylon bristles are mounted on a removable core, which is secured to brush mounting flanges on a stainless steel drive shaft.

The brush drive system provides the necessary power to drive the brush through its cleaning rotations. The gear reducer is shaft mounted to the brush drive shaft, with a torque arm securing the position of the drive during operation.

The brush drive shaft and brush drive are mounted on adjustable take-up brackets, which allow linear adjustment of the brush position to obtain optimum brush contact with the screen belt.

Spray Systems

A screen spray system is provided to facilitate the removal of screenings from the screen belt.

Nozzles are mounted on a stainless steel header and provide a washing spray pattern across the entire width of the screen belt. The spray header is located on the interior of the screen belt just above the discharge chute, and sprays outward to clean the screen belt. Screen spray water is directed out through the discharge chute.

Optional spray systems may be provided to accommodate specific application requirements.

Parkson recommends installing an automatic water supply control valve, a throttling/isolation valve and an in-line strainer in the water supply lines to optimize the use of each spray system.

Refer to the Equipment Drawings in **Part Five** of this Manual to confirm the size, type and location of each spray header connection, and to determine which water spray control components have been provided by Parkson Corporation for the Aqua Guard PF™ Filter Screen.

Front Seal Assembly

Flexible rubber seals are provided on each side of the screen frame in the channel area of the screen, to prevent bypass around the screen frame and around the ends of the screen belt.

A bottom seal is mounted at the base of the screen to prevent bypass underneath the screen belt.

Covers

Cover panels are bolted to the screen frame to enclose portions of the screen.

Select covers are provided with hinged access panels for viewing and servicing of the screen components.

Refer to Equipment Drawings in this Manual for location of covers and access panels provided on the screen.

Controls Package

An electrical control panel is typically supplied with the Aqua Guard PF™ Filter Screen to provide proper control of the screen. Controls are housed in a **NEMA 4X, 304 SST wall mounted** enclosure.

The electrical control enclosure typically contains motor starters, overload protection, screen drive current monitor, run time meters, relays, timers, indicating lights, control switches, and other control components required to properly control the Aqua Guard PF™ Filter Screen.

The control panel is shipped loose to the jobsite to be field mounted and wired by the contractor.

Control devices, such as level measuring devices, zero speed switches, wobble switches, emergency stop switches and local control stations are also shipped loose to the jobsite to be mounted and wired by the contractor.

Refer to Control Panel drawings in this Manual for specific details of the controls package and control devices supplied with the screen.

When controls for the Aqua Guard PF™ Filter Screen are not provided by Parkson Corporation, the customer is responsible for providing comparable controls. Current overload protection of the screen drive must be provided to ensure safe operation of the equipment and prevent damage to the equipment.

Cold Weather Options

For Aqua Guard PF™ Filter Screens that are installed in cold weather environments, the following options are available to ensure proper operation and use of these screens.

1. In climates where temperatures below 35°F seldom occur, it is possible to protect the Aqua Guard PF™ Filter Screen for short duration (less than 12 hours) and mild freezing (20-32°F) conditions by running the screen continuously in HAND mode during the time that freezing temperatures are occurring. It is important to periodically check the condition of the screen to insure that there is no ice build-up.

   NOTE: **It is important to check the channel for freezing water, and the screen belt, brush and discharge chute area for ice build-up or frozen screenings. If any of these areas are frozen or an ice build-up is developing, the screen should be stopped and cleared of ice build-up before restarting. Inspection should be done as required depending upon temperature, but should be as frequent as every 2-4 hours in order to prevent damage from ice build-up.**

2. In climates where the temperature is normally mild but there are occasions where the temperatures drop below 35°F (e.g. at night), a thermostat-activated switch can be supplied to run the Aqua Guard PF™ Filter Screen continuously while temperatures are below 35°F. This method is recommended for mild climate areas that do not have severe freezing temperatures (below 20°F), or for extended periods of sub-freezing weather (approx. 12-24 hours). As in Method (A) above, operators should periodically inspect the screen to insure ice build-up or freezing of the belt does not occur.

3. In climates that have frequent or extended periods of sub-freezing temperature (20-32°F) but are normally mild to moderate (above 35°F), it is recommended that the continuous operation activated by a thermostat as described in Method (B) be used and that the discharge chute area be heat traced and insulated to prevent ice build-up in that area. Frequent inspection of the screen is important (every 2-6 hours depending upon severity of freezing weather) and the screen should be removed from operation if ice build-up occurs or the channel begins to freeze.

4. In climates that normally have extended periods of freezing weather and severe low temperature conditions (below 20°F for more than a few days), the Aqua Guard PF™ Filter Screen should be installed in a heated building or enclosure with heating elements that prevent the temperature in the screen area from going below freezing. The screen should be inspected frequently (every 2-6 hours) to insure heaters are working properly and that no icing of the screen occurs. If ice develops, the screen should be stopped and cleared of ice before resuming operation.

Finishes

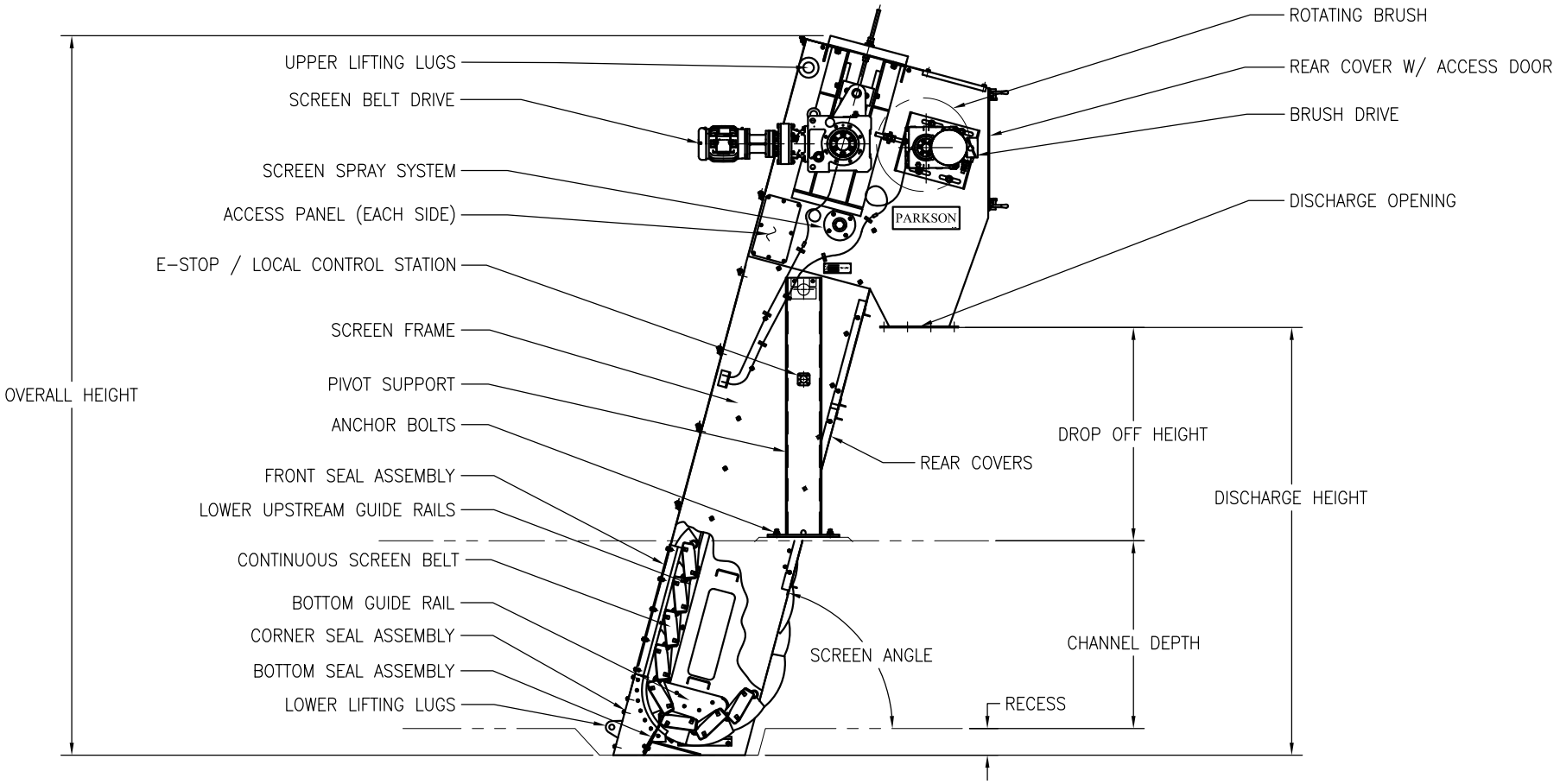
The fabricated components of the Aqua Guard PF™ Filter Screen are typically supplied in stainless steel and painted carbon steel. See Equipment Specification Sheet in Section Nine for project-specific materials of construction.

Carbon steel components receive a finish that is suitable for the environment in which the screen will be installed. Machined carbon steel components, such as shafts and take-up screws, are not painted; these items are coated with rust-inhibiting grease.

Stainless steel welds are passivated, and when necessary to achieve a uniform appearance, stainless steel components are sand blasted. Otherwise, stainless steel components receive standard shop clean up. No additional finishes are applied to the stainless steel components.

When working on stainless steel components, use tools that are designated for use on stainless steel equipment only. Use of carbon steel alloy tools, or tools also used on carbon steel equipment, may create surface rust on the Aqua Guard PF™ Filter Screen.

Purchased components (motor, reducer, bearings & switches) receive the manufacturer's standard finish.



AQUAGUARD PF SCREEN
STANDARD EQUIPMENT FEATURES
FIG 2A

SECTION THREE

Aqua Guard PF™ Filter Screen
INSTALLATION

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND ARE FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

Location

The Aqua Guard PF™ Filter Screen has been designed to fit into a specific channel configuration. Prior to installing the screen, verify that dimensions of the structure conform to those indicated on the Equipment Drawings. Report any discrepancies to Parkson Corporation before proceeding.

The screen should not be installed in a location where it is exposed to temperatures below freezing for extended periods of time. Where this is not possible, provision should be made to prevent screenings from freezing on screen components (such as providing heat tracing of discharge chute, allowing the unit to run continuously when ambient temperature drops below freezing, enclosing the unit is a heated structure, etc.). See Cold Weather Options in Section Two for additional details.

Service Access

The installation of the Aqua Guard PF™ Filter Screen should take into account access for service requirements.

If the unit is provided with provisions for pivoting the screen out of the channel into a maintenance position, verify that items in the path of the pivoting screen can be readily removed (such as channel grating, handrails & connecting chutes). Equipment that is permanently installed or cumbersome to remove (such as a screenings conveyor, slide gates, level measuring devices) should be located out of the path of the screen pivot if possible.

If the unit is provided with fixed mounting brackets, provisions must be made to ensure that the screen components can be serviced. It is recommended that access be provided to allow the removal of the entire screen from the channel in the event that the screen must be overhauled.

In order to replace spray headers, a service clearance approximately equal to the width of the channel should be made available on one side of the screen.

Provisions should be made to isolate the screen from the flow. Upstream and downstream slide gates, along with a by-pass channel, typically provide adequate screen isolation while allowing flow to continue through the plant. Servicing of the screen below the operating floor requires complete drainage of the channel.

Refer to the Equipment Drawings in this Manual for additional service clearance dimensions for a specific screen configuration.

Site Preparation

Confirm that the site where the screen will be mounted is level and sound. Be prepared to shim the screen mounting brackets where necessary.

Review Equipment Drawings to confirm that anchors can be installed as indicated on these drawings.

Confirm that channel walls are plumb (+/- ¼ inch) and parallel to one another to allow the screen to sit squarely in the channel.

Confirm that the channel floor is flat and sound. For a screen that is to be installed in a floor recess, also confirm that the floor recess dimensions match the dimensions indicated on the Equipment Drawings.

Securing Screen Supports

On units provided with stationary screen supports, the screen supports are typically fastened to the screen frame prior to shipment. If the stationary screen supports were removed for shipment, fasten the screen supports to the threaded bosses on the screen frame. Apply a heavy-duty thread locker (LocTite 271 or equal) to the support bolt threads when fastening the supports to the frame.

On units provided with the pivoting feature, the pivot supports are shipped loose, separate from the unit. In the installed position, the pivot tubes welded to the screen frame will rest in the cradle of each pivot support.

Position the pivot supports on the concrete structure, as indicated on the Equipment Drawings, and mark the location of the support anchors. Install the pivot support anchors and secure the initial position of the pivot supports. The pivot supports must be secured to the concrete structure before the weight of the screen is placed on the supports. Do not, however, grout the pivot supports until after the screen is installed, leveled and plumbed.

Remove the cap plate from each pivot support. The cap plates must be reinstalled after the pivot tubes are positioned in pivot cradles.

Lifting and Positioning the Unit

Before lifting the equipment, confirm that the Aqua Guard PF™ Filter Screen can be safely transported to the point of installation. Confirm that all possible obstructions with construction equipment, buildings, structures and surrounding process equipment have been removed.

Equipment weights are noted on the Equipment Drawings. Note this to ensure that suitable lifting equipment is used, and to ensure that the installation surface is of adequate strength to support all of the installed equipment.

CAUTION

THE SCREEN FRAME IS DILIGENTLY CHECKED FOR SQUARENESS AND STRAIGHTNESS DURING FABRICATION AND SHOP TESTING OF THE EQUIPMENT. TAKE EXTREME CAUTION NOT TO TWIST THE SCREEN FRAME DURING INSTALLATION, AS THIS WILL CAUSE THE SCREEN BELT TO TRACK POORLY AND MAY DAMAGE THE EQUIPMENT. DO NOT TURN THE EQUIPMENT ON ITS SIDE OR UPSIDE DOWN.

Using suitable equipment, lift the screen by its lifting lugs, which are welded to the frame of the Aqua Guard PF™ Filter Screen. The upper lifting lugs are to be used to lift the screen while the lower lifting lugs are used to position the screen. Spreader bars should be used so that lifting straps are positioned at an angle not less than 60° with respect to horizontal. Do not lift the screen using drive reducer or motor lifting eyes.

Unit should be balanced and under control at all times as it is being maneuvered into positioned. Care must be taken to prevent the unit from striking personnel or other equipment. Do not stand underneath the unit as it is being lifted into position.

Position the screen in its proper location. The outer channel seals on the upstream side of the screen should be overlapping the channel sidewalls enough to bend the free edge of the seals upward, for the entire length of the seals. This will allow the outer seals to maintain positive contact with the walls during flow conditions. Gaps between the seals and channels side walls will allow by-pass around the screen.

On units provided with the pivoting feature, secure the pivot locking brackets to the screen frame and to the pivot support legs. The pivot locking brackets prevent the unit from pivoting.

Keep lifting devices on the screen until the screen is secured to the structure.

Leveling, Plumbing and Squaring the Unit

These procedures are recommended to provide an initial leveling, plumbing and squaring of the unit. Final grouting must not be done until proper screen belt tracking has been confirmed, as further adjustments of the frame and support brackets may be required to provide proper screen belt tracking.

Confirm that the bottom frame of the Aqua Guard PF™ Filter Screen is resting entirely on the bottom of the channel and is installed at the correct angle. Shim the base of the screen, if necessary, and seal all gaps between the screen and the channel floor.

Confirm that the screen panels are level across the width of the screen and that the screen mounting brackets are level along the depth of the screen (+/- 1/32"). Shim the screen mounting brackets, if necessary.

Confirm that the screen is mounted parallel to the channel walls. Screen mounting brackets should be equidistant (+/- ¼") from the edge of the channel walls, and should be located as indicated on the Equipment Drawings.

Use a plumb bob to confirm that each side frame is plumb (+/- 1/16" from plumb line, for every 10 ft of screen height). Hang the plumb bob from the screen drive area to the bottom of screen to ensure that the plumb line is a meaningful length. Shim the base of the screen or the screen mounting brackets, if necessary.

If it is suspected that the screen frame is not square, confirm this by taking cross frame measurements. Contact Parkson Corporation in the event that the screen frame is not square.

Anchoring

Secure the Aqua Guard PF™ Filter Screen supports to the structure, using the anchors detailed on the Equipment Drawings.

There are many methods of anchoring the equipment to the ground, any of which are acceptable for a particular installation. Please choose the method most suitable for your application.

Listed here are the most common methods for anchoring equipment:

> If this equipment is to be installed in a new facility, cast-in-place anchor bolts may be used. This method is acceptable for most installations but offers the least amount of flexibility. If any of the anchor bolts are off by the slightest margin, this may require modification of the equipment to get it set properly.
>
> Expansion type anchor bolts or chemical adhesive anchors may be a better choice for either an existing or a new facility. They are easy to install and offer greater flexibility. Set the equipment in place and mark the locations of all anchor attachments. Remove the equipment and drill holes of proper size and depth for the anchors chosen. Install the anchor bolts (per manufacturer's recommendation) and set the equipment back in place. It may also be possible to drill and install these types of anchors with the equipment set in its proper position.

Regardless of the anchoring method used, anchors should be grouted in place only after the equipment is completely installed and properly operating.

Do NOT apply any grout until after all leveling checks are performed, and proper screen belt tracking has been confirmed.

Screen Drive System

These instructions apply if the screen drive has been disassembled for shipment.

Before installing the screen drive, read the instructions in Section Six of this Manual, as well as the drive manufacturer's instructions in Section Nine of this Manual.

CAUTION

THE SCREEN DRIVE GEAR REDUCER IS MOUNTED TO THE SCREEN DRIVE SHAFT WITH A TAPER BUSHING. THE TAPER BUSHING MUST BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS. AN IMPROPERLY INSTALLED TAPER BUSHING MAY DAMAGE THE GEAR REDUCER AND THE EQUIPMENT.

Lift the screen drive into place and secure to the screen drive shaft. Fasten the screen drive torque arm to the screen frame or to the torque arm retainer, depending upon which torque arm design is provided. Apply an anti-seize compound to the bolt before securing the torque arm.

The position of the screen drive has been set at the factory during testing of the equipment. When the unit is installed level and plumb, there will typically be no need to adjust the initial screen shaft position. However, proper screen belt tracking and tension must be checked prior to allowing the screen to operate under process conditions.

If the installed screen drive does not match the configuration shown on the Equipment Drawings, or if there is any indication that the drive has been damaged, contact Parkson Corporation.

Confirm that the threaded take-up rods, which are used to adjust the position of the screen drive shaft, are coated with an anti-seize compound or rust-inhibitive grease. This will ensure that the threads engage freely when screen belt adjustments are required.

Brush Drive System

These instructions apply if the brush drive has been disassembled for shipment.

Before installing the brush drive, read the instructions in Section Six of this Manual, as well as the drive manufacturer's instructions in Section Nine of this Manual.

CAUTION

THE BRUSH DRIVE GEAR REDUCER IS MOUNTED TO THE BRUSH DRIVE SHAFT WITH A TAPER BUSHING. THE TAPER BUSHING MUST BE INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS. AN IMPROPERLY INSTALLED TAPER BUSHING MAY DAMAGE THE GEAR REDUCER AND THE EQUIPMENT.

Lift the brush drive into place and secure to the brush drive shaft. Fasten the brush drive torque arm to the drive end take-up bracket. Apply an anti-seize compound to the bolt before securing the torque arm. Per the manufacturer's instructions, the rubber bushings supplied for the torque arm must be allowed to rotate by hand; in other words, the rubber bushings must not be compressed. This allows the shaft mounted gear reducer to move slightly when loaded, which reduces the impact on the gear reducer bearings.

The position of the brush drive has been set at the factory during testing of the equipment. There typically will be no need to adjust the initial brush shaft position. However, proper brush contact with the screen belt must be checked prior to allowing the screen to operate under process conditions.

If the installed brush drive does not match the configuration shown on the Equipment Drawings, or if there is any indication that the drive has been damaged, contact Parkson Corporation.

Confirm that the threaded take-up rods, which are used to adjust the position of the brush take-up brackets, are coated with an anti-seize compound or rust-inhibitive grease. This will ensure that the threads engage freely when brush position adjustments are required.

Screenings Discharge Chute / Receptacle

The Aqua Guard PF™ Filter Screen is typically provided with a flanged screenings discharge opening. If provided, attach the transition chute to the screenings discharge flange, to provide the required directing of discharged screenings into an appropriate receptacle or screenings handling equipment. Transition chute and screenings collection device should be designed to allow routine use and maintenance of the screen and the screenings collection device.

Covers & Guards

Confirm that all covers and guards are in place.

Miscellaneous Components

Install miscellaneous components as shown on the Equipment Drawings, per the manufacturer's instruction included in Section Nine of this Manual. Items such as level measuring devices, zero speed switches, wobble switches, emergency stop switches and local control stations are typically shipped loose to be field mounted.

NOTE: **Ancillary equipment, such as screenings collection devices, must be selected to ensure that the recommended operating parameters of the Aqua Guard PF™ Filter Screen are met. It is the end-user's responsibility to ensure that the overall system is properly and safely designed, installed, controlled and maintained.**

Piping

The contractor is responsible for connecting the water supply line to each spray system header on the Aqua Guard PF™ Filter Screen. Spray system components provided with the screen, as well as water requirements and type and size of header connections, are detailed on the Equipment Drawings. All other components required for a safe and fully functional spray system are to be supplied and installed by the contractor.

When making piping connections to the Aqua Guard PF™ Filter Screen, do not use the equipment as a pipe support. All piping should stand on its own if disconnected from the equipment. Use appropriate fittings to allow disassembly of the spray system in order to service spray system components.

The mounting of the screen spray header is designed to provide infinite rotational adjustment of the header. A union or similar fitting is recommended to be used at the header connection to allow the spray header to be rotated to an optimal position.

It is recommended that an automatic control valve (e.g. solenoid valve) be installed to optimize use of the spray and that an upstream manual isolation valve be installed to allow servicing of the header. The isolation valve should also serve as a throttling valve to fine-tune the water usage of the spray system. A gate valve will provide isolation as well as throttling capability. Valves should be selected to best suit the installation.

If the source of water for the spray system is known to contain solids, such as plant water, an in-line strainer should be installed in the water supply line to minimize the risk of nozzle orifice plugging. A strainer with a 50 mesh (.011 inch) screen is recommended for effective removal of solids.

Water supply control components may have been shipped loose to the job site for field assembly – please refer to the Equipment Drawings to determine which water supply control components have been provided by Parkson Corporation.

In cold weather environments, the spray water pipe (up to the screen) should be insulated and possibly heat traced to prevent freezing of the spray water.

Because periodic housekeeping is required, a separate water supply with a hose and nozzle should be made available near the screen.

Wiring of Electrical Components and Control Panels

The contractor is responsible for supplying and installing all wiring required to connect the electrical components provided by Parkson Corporation for operation and control of the Aqua Guard PF™ Filter Screen. The electrical components mounted on or near the screen typically are not pre-wired to a common junction box. Refer to the Equipment Drawings and Control Panel Drawings in this Manual to determine specific wiring requirements for the electrical components that have been provided. All other electrical components required for a safe and fully functional system are to be supplied and installed by the contractor.

Contractor should be familiar with applicable electrical codes (national, state, and local) and with the specific electrical requirements for the installation.

The control panels have been designed and the electrical components have been selected to be suitable for the environment in which they will be installed. If the contractor believes that this is not the case, the contractor should contact Parkson Corporation before proceeding with installation.

When controls for the Aqua Guard PF™ Filter Screen are not provided by Parkson Corporation, the customer is responsible for providing comparable controls. Current overload protection of the screen drive must be provided to ensure safe operation of the equipment and prevent damage to the equipment.

Mount the control panels as required for optimal access and use.

Refer to applicable codes to determine if local disconnects are required for unit-mounted electrical components.

Run required conduit and wiring from the power source to the main control panel, and to each electrical component required to operate and control the Aqua Guard PF™ Filter Screen. These include components not mounted directly on the screen (e.g. level sensors, local control stations, local disconnects).

To prevent damage to conduit and wiring during normal plant operations, conduit should be run in the least obtrusive path.

Brush and screen motors are designed to be adjusted; provide flexible connections to allow these drives to be adjusted without disconnecting.

On screens supplied with a pivoting feature, means for disconnecting electrical components during servicing of the screen should be provided. Alternatively, electrical connections may be made with enough flexibility to allow pivoting without requiring disconnection.

All electrical and wiring components mounted on the screen should not prevent service access (e.g. interfere with removable covers, restrict screen or brush adjustments).

Ensure that electrical and wiring components mounted on the screen do not impede removal of the screen, in the event that the screen must be lifted out of the channel for servicing. Provide removable screen attachments to prevent this situation.

SECTION FOUR

Aqua Guard PF™ Filter Screen
OPERATING INSTRUCTIONS

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

Pre Start-Up Checks

1. Confirm that the equipment setup matches that which is shown on the Equipment Drawings in this Manual. Verify that all features and options supplied with the screen have been installed.

2. Check the oil level and condition in each oil-lubricated stage of the screen and brush drive gear reducers. Change or add oil, as required. Unless the gear reducer has been improperly stored, or stored for more than one year, grease-lubricated gear reducers typically do not require new or additional grease. Refer to Section Nine for manufacturer's information on the type of lubrication provided in each stage of the screen and brush drive gear reducers and the correct location of the oil level plug in each stage of the reducer.

3. Confirm that the air vents (breather plugs) have been installed in each stage of the screen and brush drive gear reducers to ensure proper ventilation. Refer to Section Nine for manufacturer's information on the correct location of the air vents (breather plugs) in each stage of the gear reducers.

4. Remove debris and dirt from the surface of the motors and gear reducers, and from motor enclosure cooling fins to ensure proper cooling.

5. Confirm that all piping connections have been made.

6. Check all external fasteners to ensure that they are tight.

7. Check nuts on all mounting anchors to ensure that they are tight.

8. Confirm that all packaging material and construction debris has been removed form moving parts of the screen.

Control Panel

Confirm that all wiring and terminal connections are secure. Confirm that the control panel power supply is the correct voltage and phase, and that it is properly grounded.

Confirm that all screen switches function properly. Emergency stop switches must be checked before jogging of the motors. Checking other control switches may be accomplished during subsequent start-up checks.

For additional information on electrical controls and wiring supplied by Parkson Corporation, refer to the Control Panel Drawings provided in **Part Four** of this Manual. Copies of Control Panel Drawings are also provided in the door of the control panel enclosures. Contact Parkson Corporation if there are any additional questions or concerns.

Drive Overload Protection (Current Monitor)

Adjust current overload protection (current monitor) in the electrical control panel. The Trip Point and Trip Delay Time should be set as low as possible to protect the equipment during an overload condition. It is imperative that the current monitor be set properly to shut down the screen before damage to the equipment occurs. See Section Nine for additional component information and Section Six for additional details on adjusting the current monitor.

NOTE: **The current monitor is set while the motor is running, which requires access to the inside of a powered control panel. Only authorized and qualified personnel should perform this procedure.**

When a variable speed drive is provided to optimize the operating speed of the screen, a separate current monitor is typically not provided. However, overload settings in the VFD must be properly set to ensure immediate shut down of the screen drive when an overload condition is detected.

When Parkson Corporation does not provide controls for the screen, it is the customer's responsibility to provide the necessary current overload protection, as well as all required control devices and logic. Overload protection must be provided for all modes of screen operation (Auto mode, Hand mode, Reverse mode). Consult Parkson Corporation for details of the required overload protection, control logic, and control components.

Drive Motors

Inspect all electrical connections at the motors and ensure that wiring is not loose.

Jog the motors to check for proper rotation. An arrow on each drive indicates the correct rotation of the respective motor. The screen belt should be traveling upward on the upstream side of the screen. The brush shaft should be rotating in a direction opposite that of the screen belt shaft (brush bristles and screen belt will be traveling in the same direction at the point that the brush contacts the screen belt). If the rotation needs to be changed, swap the position of two of the leads at the motor or motor starter, and check the rotation again.

Dry Run

CAUTION

IN THE EVENT OF A SCREEN JAM, LOCK-OUT AND TAG-OUT THE SCREEN AND BRUSH DRIVES, DETERMINE THE CAUSE OF THE JAM AND REMOVE THE OBSTRUCTION BEFORE ATTEMPTING TO RE-START THE SCREEN. THE FAN ON THE SCREEN DRIVE MOTOR MAY BE TURNED BY HAND IN FORWARD OR REVERSE TO RELIEVE THE TENSION ON THE SCREEN BELT, WHICH MAY HELP TO DISLODGE THE OBSTRUCTION.

SCREEN CONTROLS PROVIDED BY PARKSON CORPORATION ARE NOT SUPPLIED WITH THE PROVISION FOR REVERSING THE SCREEN. IF CUSTOMER-SUPPLIED CONTROLS HAVE THE PROVISION FOR REVERSING THE SCREEN (E.G. THROUGH A REVERSING STARTER OR A VFD), THEN THE SCREEN MUST ONLY BE JOGGED IN REVERSE, AND EXTREME CAUTION MUST BE EXERCISED WHEN DOING SO TO PREVENT DAMAGE TO THE SCREEN OR INJURY TO PERSONNEL. THE SCREEN MUST NOT BE ALLOWED TO RUN CONTINUOUSLY IN REVERSE.

Perform a “dry run” test of the screen belt. Run the screen belt in Manual mode and check for any unusual noises or vibrations. During the initial two hours of operation, monitor the amp draw and be observant of any signs of binding or poor tracking of the screen belt.

NOTE: **The screen belt chains are normally lubricated by the wastewater. If a dry performance test will be conducted on the installed Aqua Guard PF™ Filter Screen for more than 2 continuous hours, apply vegetable oil (or similar product) to the chain rollers to minimize wear.**

A properly adjusted screen belt will run smoothly, with minimal noise and negligible movement of the screen drive. The screen belt will also be centered between the screen frames (+/- 1/8”).

The screen belt will have slight yet noticeable sag between the points where it leaves the downstream guide rails and where it enters the bottom turnaround. This is typically the area of the screen belt that is just below the top of the channel on the downstream side of the screen. In this area, the screen belt should flex when pushed inward toward the center of the screen frame.

It is best to confirm proper belt tension by inspecting the belt as it enters into the bottom 180-degree turn. Ideal screen tension will allow the rollers on the screen belt chains to enter the bottom turnaround without contacting the leading edges of either the half moon shaped bottom guide rail or the lower upstream guide rail at the bottom of the screen (see Fig 6R).

If adjustment of the screen belt is required, follow the instructions in Section Six for performing this procedure (see Fig 6E). Make adjustments in small increments, and test the screen belt for smooth operation.

NOTE: **Proper belt tracking is of primary importance in ensuring long service life of the Aqua Guard PF™ Filter Screen. If the screen belt cannot be adjusted and centered to the tolerance mentioned above, contact Parkson Corporation for further instruction.**

CAUTION

IF THE SCREEN BELT IS OVER TIGHTENED, THE SCREEN BELT CHAINS AND BOTTOM GUIDE RAILS WILL EXPERIENCE ACCELERATED WEAR AND SCREEN COMPONENTS MAY BE DAMAGED. THE SCREEN BELT SHOULD HAVE SOME SLACK TO PREVENT THIS CONDITION (SEE FIG 6R).

EXCESSIVE SAG OF THE SCREEN BELT SHOULD ALSO BE AVOIDED (SEE FIG 6R), AS THIS CAN CAUSE THE SCREEN BELT TO BIND, WHICH MAY DAMAGE THE SCREEN BELT AND OTHER SCREEN COMPONENTS.

As the screen belt is traveling through its cycle, confirm that all screen panel fasteners, chain snap rings and pin end plugs are in place. Remove the access panels near the discharge chute to perform this check on both chains of the screen belt.

Loose screen panel fasteners must be re-tightened using LocTite 271 heavy-duty thread locker. Unseated snap rings must be re-seated. Missing fasteners, snap rings, and end plugs must be replaced.

NOTE: **Lock washers are not provided on the screen panels. To secure the position of screen panel fasteners and prevent them from loosening and possibly falling out, screen panel fasteners must be re-assembled with LocTite 271 heavy-duty thread locker. Thread locker must be used any time the screen panel fastener is removed for servicing, or if it is observed that the bolt has become loose.**

Screen panel screws should be tightened to a torque of 15 to 20 ft-lb.

Run the rotating brush and observe for proper operation. The brush shaft should be rotating in a direction opposite that of the screen belt shaft.

The tips of the bristles should be making good contact with the screen panels. Proper brush contact will vary per the application requirements. Each screen panel has a 'shelf' that is approximately 2 inches deep. Typically, with a new brush, the fully extended brush bristles should extend ~75% into the depth of the screen panel shelf (i.e. the tips of the bristles should extend approximately 1.50 inches past the protruding edge of the panel).

Another check to confirm and monitor the brush position is the distance from brush shaft centerline to screen shaft centerline. When this measurement is 19.50 inches, the tips of a new brush can reach the gap between adjoining screen panels. For a new brush, the brush shaft should not be less than 19.50 inches from the screen shaft. New brush bristles should not extend into the gap between adjoining screen panels, as this may cause the brush and the screen belt to bind.

As the brush wears, the bristles become more flexible, and the brush can be adjusted further into the screen belt to improve screen belt cleaning. However, the brush motor amp draw must not exceed the brush motor nameplate Full Load Amps.

Note that, while further inward adjustment of the brush may improve screen belt cleaning, the rate of brush wear increases as the brush is adjusted further inward. To optimize the life of the brush, adjust the brush to meet the above criteria and provide an acceptable degree of screen belt cleaning.

As the screen belt travels past the rotating brush, the shape of the screen panels creates a varying profile. The flexing brush bristles making contact with this varying profile produces a fluctuating load on the brush drive. Slight movement of the brush drive is expected due to this loading.

If adjustment of the brush position is required, follow the instructions in Section Six for performing this procedure (also see Fig 6A). Confirm that brush contact is even across the width of the screen belt.

Add grease to the screen and brush drive shaft bearings while the screen and brush are running.

Seals

Confirm that the chute seal is properly adjusted: The leading edge of the screen panels should travel within ¼" of the chute seal, and the screen belt side plates must travel within ¼" of the sides of the chute seal. Confirm that silicone sealant has been applied between the chute seal and screen frame.

Confirm that the front, corner and bottom seals are adjusted properly and making proper contact with the screen belt throughout the screen belt cycle. Front Seals and Corner Seals must contact the screen belt side plates, and the leading edge of the screen panels should travel within ¼" of the seals. Bottom Seal must always make contact with the screen panels as the screen belt travels past the Bottom Seal. Seals must not 'buckle' as the screen belt travels through its cycles. Make seal adjustments after final screen adjustments.

Confirm that front outer seals are making proper contact with the channel walls.

Spray Systems

Manually operate the spray systems on the screen. Confirm that the automatic control valve operates properly, and that there are no leaks.

Check for an even spray pattern, equal distribution across the width of the header and correct pattern position (see Fig 6H or Fig 6J). If nozzles need to be serviced or adjusted, follow the instructions in Section Six for performing this procedure.

Spray header has two spray patterns that strike the screen belt at different locations. Bottom spray pattern should strike the screen belt ~3 to 6 inches above the chute seal.

If an isolation / throttling valve was installed in the water supply line, confirm that it functions properly, and does not leak in the closed position.

Due to debris often found in new construction piping, check all nozzles for clogging after the initial several hours of operation. Clogged nozzles must be cleaned in order to provide optimum cleaning of the screen belt.

If a strainer was installed in the water supply line, clean the strainer after the initial several hours of operation.

Miscellaneous Items

Confirm that all optional components supplied with the screen are working properly. These include level sensing device (float switch, level transmitter), zero speed switch, thermostat override, heat tracing, and wobble switch.

Confirm that each screen mounting bracket is properly grouted after all installation checks and adjustments have been made and verified.

Start Up Procedure

It is important that all installation and pre-start checks have been completed and that all deficiencies have been corrected before the equipment is started. If, at any time, water leaks are detected, or there is evidence of screen belt binding or other overload, the system should be shut down; all necessary repairs must be made before the system is re-started.

1. Confirm that a screenings receptacle is in place and is ready to accept discharged screenings, or that the screenings handling equipment is operational and ready to process discharged screenings.

2. Introduce channel flow to the screen. Prevent back flow through the screen by opening the upstream slide gate first. The screen must not be operated when there is backflow through the screen.

3. Turn power ON to enable the Aqua Guard PF™ Filter Screen. Place screen and brush selector switches in AUTO mode. Place spray system selector switch(es) in AUTO, and confirm that the isolation valve(s) is open.

4. Note when screen operation is initiated. If the screen is initiated by level sensing, then confirm that the level sensing devices are set at the proper elevation for the installation. If a time clock or repeat timer initiates the screen, then confirm that timer settings are proper for the installation. Adjust accordingly.

CAUTION

IT IS RECOMMENDED THAT THE SCREEN BE RUN ONLY WHEN NECESSARY. WHILE EXCESS RUN TIME WILL DECREASE THE LIFE OF THE UNIT, EXCESS HEADLOSS CAUSED BY RUNNING THE SCREEN TOO INFREQUENTLY MAY DAMAGE THE EQUIPMENT OR CAUSE UPSTREAM PROCESS PROBLEMS.

IT IS IMPORTANT THAT THE SCREEN OPERATION BE INITIATED PROPERLY TO AVOID EXCESS RUN TIME AND EXCESS HEADLOSS ACROSS THE SCREEN. ADJUST THE SCREEN INITIATION MEANS AND RECHECK.

THE SCREEN SHOULD BE CONTROLLED TO ALLOW IT TO RUN A MINIMUM AMOUNT OVER A PERIOD, REGARDLESS OF THE SOLIDS LOADING ON THE SCREEN. FOR EXAMPLE, SET A TIME CLOCK TO OPERATE THE SCREEN FOR TWO COMPLETE CYCLES EVERY 4 HOURS, REGARDLESS OF OTHER SCREEN INITIATION COMMANDS. WHEN OPERATED AS SUCH, THE POSSIBILITY FOR SCREENINGS DRYING ON THE SCREEN BELT IS MINIMIZED.

5. Controls are designed to operate the brush and screen at the same time. This is to minimize the possibility of stationary brush bristles binding in the perforations of a moving screen belt. Confirm that the brush operation is initiated before or at the same time as the screen.

6. Observe screenings being carried to the point of discharge, and being discharged off the screen belt. Observe the operation of the spray system and rotating brush.

7. During cold weather operation (below 35°), the screen should be set to run continuously to prevent screenings and moisture from freezing on the moving parts of the screen, or from interfering with the moving parts of the screen. If the screen is started up in cold weather, ensure that there is no ice build-up or frozen screenings on the screen that would interfere with the moving parts of the screen before starting the screen.

   See Cold Weather Options in Section Two for additional information about operating the screen in cold weather installations.

Normal Shutdown Procedure

This procedure is recommended when the Aqua Guard PF™ Filter Screen will be taken out of service for an extended period of time. An 'extended period of time' is considered a period of down time that will allow screenings to dry on the screen belt or other parts of the screen, which would create operational problems upon re-starting the unit.

1. Prevent flow from passing through the Aqua Guard PF™ Filter Screen by closing upstream and downstream slide gates. Prevent back flow through the screen by closing the downstream slide gate first. The screen must not be operated when there is backflow through the screen.

2. Run the Aqua Guard PF™ Filter Screen, including sprays and brush, for several screen belt cycles to remove as much screenings material as possible. Wash down the screen belt and discharge chute, removing as much of the residual screenings as possible.

3. Turn power OFF to disable the screen and brush at the same time (screen should not run while the brush is off). Lock out power to the unit (from all sources of power).

4. Dispose of collected screenings from the solids receptacle, or process screenings through the screenings handling equipment so that it can readily be restarted when the Aqua Guard PF™ Filter Screen is returned to service.

For long-term shutdown (i.e., the screen will be idle for more than 1 month), follow the Long Term Storage requirements in Section One of this Manual

NOTE: **Before placing an idle screen back into service, the old oil in each stage of the screen and brush drive gear reducers that have been placed in Long Term Storage must be completely drained, and new oil must be added to each stage to its proper operating level.**

Emergency Shutdown Procedure

The Aqua Guard PF™ Filter Screen is equipped with Emergency Stop push buttons, mounted on the equipment and on the control panel.

Pressing any one of the Emergency Stop push buttons will shut down the unit immediately (screen and brush will stop, and spray water will be shut off). When Parkson provides the screenings handling equipment that is directly tied to the screen (e.g. conveyor, washer/compactor), the screen Emergency Stops will also shut down the screenings handling equipment.

A motor overload or motor overcurrent condition may also cause the unit to shut down, causing an emergency situation.

When an emergency shutdown has occurred, determine the cause of the shutdown and confirm that the cause has been addressed before attempting to restart the equipment. Restart the equipment by performing the normal Start Up Procedures.

NOTE: **Before placing an idle screen back into service, the old oil in each stage of the screen and brush drive gear reducers that have been placed in Long Term Storage must be completely drained, and new oil must be added to each stage to its proper operating level.**

SECTION FIVE

Aqua Guard PF™ Filter Screen
MAINTENANCE

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

LUBRICATION CHART

DESCRIPTION	MFR.	GREASE / OIL TYPE	AMOUNT REQUIRED	RECOMMENDED FREQUENCY
Screen Drive Gear Reducer (Cyclo input section)	Sumitomo	ExxonMobil Unirex N2 Lithium Complex NLGI #2 Grease	Consult Sumitomo for Overhaul Grease Quantity	Replace as part of drive overhaul, every 20,000 hrs or every 5 years.
Screen Drive Gear Reducer (Buddybox output section)	Sumitomo	Mobilgear 600 XP – 150 ISO 150	1.16 gallons (3C)	Replace after initial 500 hours. Check level and condition monthly. Change every 2,500 hours, or every 6 months.
Screen Drive Motor Bearings	Baldor	ExxonMobil Polyrex EM Polyurea High Speed Bearing Grease, NLGI #2	0.2 cu. in. 0.15 oz 3.9 g	Replenish every six months.
Brush Drive Gear Reducer (Cyclo input section)	Sumitomo	ExxonMobil Unirex N2 Lithium Complex NLGI #2 Grease	Consult Sumitomo for Overhaul Grease Quantity	Replace as part of drive overhaul, every 20,000 hrs or every 5 years.
Brush Drive Gear Reducer (Buddybox output section)	Sumitomo	Mobilgear 600 XP – 150 ISO 150	0.24 gallons (A)	Replace after initial 500 hours. Check level and condition monthly. Replace every 2,500 hours, or every 6 months.
Brush Drive Motor Bearings	Baldor	ExxonMobil Polyrex EM Polyurea High Speed Bearing Grease, NLGI #2	0.2 cu. in. 0.15 oz 3.9 g	Replenish every six months.
Screen Drive Shaft Bearings	PTC Link Belt	Exxon Unirex EP2 Lithium Complex Grease, NLGI #2 w/ EP additives	Add until grease appears around seals.	Replenish weekly
Brush Drive Shaft Bearings	Browning	Exxon Unirex EP2 Lithium Complex Grease, NLGI #2 w/ EP additives	Add until grease appears around seals.	Replenish weekly
Screen Belt Chain	Parkson Corporation	Husky #32042 Synthetic Dry Film Lubricant	As Req'd	Immerse NEW chain in bath of lubricant (not required after initial application).

NOTE: **When applying lubricants, use same viscosity grade number (NLGI, ISO) and base as existing grease or oil. Do not mix grades and bases. Purge all old grease or oil if a different grade or base must be used.**

Refer to product data in Section Nine for additional lubrication information.

Note the temperature recommendations for each grease and oil product that is used. If the equipment will be exposed to a wide range of ambient temperatures, it may be necessary to periodically change the type of grease or oil that is used (e.g. a seasonal change to a product that is designed for use in ambient temperatures below 32° F).

Plant operators are responsible for proper use and disposal of all used greases and oils.

MAINTENANCE SCHEDULE

PROCEDURE	RECOMMENDED FREQUENCY
Conduct visual overview of all equipment. Check for obvious malfunctions (unusual noises, leaks, control alarm conditions, etc.). Confirm that all guards are in place.	Daily
Perform general housekeeping (clean exterior surfaces on and around equipment, especially cooling surfaces on motors and reducers).	Initially, daily. Afterward, as required.
Replenish brush drive shaft bearing grease.	Weekly
Replenish screen drive shaft bearing grease.	Weekly
Clean interior of screen. Use high-pressure washer to remove accumulated debris, particularly on screen belt, spray system headers, and discharge chute seal. Do not apply a high-pressure wash to the brush bristles.	Monthly
Clean exterior of reducers and motors. Check exterior temperature of drive gear reducers and motors. If high, check motor amp draw and insulation. Repair or replace drives as required.	Monthly
Check oil level and oil quality in the screen drive gear reducer and brush drive gear reducer. Replenish or replace, as required.	Monthly
Check all fasteners on the screen and brush drives. Check nuts on anchor bolts. Tighten as required.	Monthly
Check condition of brush. Adjust position of brush for optimal contact. Replace brush, if necessary. Check all fasteners on the brush and brush drive shaft bearings.	Monthly
Check screen panel fasteners, snap rings and pin end plugs. Apply LocTite 271 when replacing or tightening screen bolts. Re-seat or replace snap rings. Replace damaged or missing end plugs.	Monthly
Check screen panel side plates. Repair or replace damaged plates.	Monthly

MAINTENANCE SCHEDULE (cont'd.)

PROCEDURE	RECOMMENDED FREQUENCY
Check pattern of spray systems. Clean or replace nozzles that are delivering an erratic spray pattern. Check all fasteners on the spray system.	Monthly
Check front seals. Remove screenings lodged under seals. Replace if worn, torn, or otherwise not in full contact with channel walls or screen belt.	Monthly
Check screen belt chain slack; adjust as required.	Monthly, for 1st six months. Semi-annually afterwards.
Check the functioning of the screen drive current monitor. Monitor must shut down screen immediately upon detecting an overload condition.	Quarterly
Check Reducer's Taper Grip Bushing screw torque	Semi-Annually
Drain, flush and replace oil in the oil-lubricated stages of the screen drive gear reducer and brush drive gear reducer.	Semi-Annually
Replenish bearing grease in the screen and brush drive motors, as applicable.	Semi-Annually
Perform complete interior inspection of screen (screen belt and chains, guide rails, screen drive shaft & sprocket). Repair or replace worn components.	Annually
Check operation of all electrical components (switches, current monitors, pilot lights, level measuring devices).	Annually
Drain channel and remove accumulated debris (heavy solids, grit, gravel) in immediate proximity of the base of the screen. Check condition of all seals (front, corner, and bottom); replace if worn, torn, or otherwise not in full contact with channel walls or screen belt.	Annually
Remove screen drive bearing guards (if provided) and clean the screen drive bearing pockets. Do not apply a high-pressure wash to the bearings. Check exterior of screen drive bearings. Replace guard gaskets and seals if necessary.	Annually (
Overhaul the screen drive gear reducer and brush drive gear reducer.	Every 5 years

SECTION SIX

Aqua Guard PF™ Filter Screen
ADJUSTMENT, REPAIR AND REPLACEMENT

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND ARE FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

IN THE EVENT OF A SCREEN JAM, LOCK-OUT AND TAG-OUT THE SCREEN AND BRUSH DRIVES, DETERMINE THE CAUSE OF THE JAM AND REMOVE THE OBSTRUCTION BEFORE ATTEMPTING TO RE-START THE SCREEN. THE FAN ON THE SCREEN DRIVE MOTOR MAY BE TURNED BY HAND IN FORWARD OR REVERSE TO RELIEVE THE TENSION ON THE SCREEN BELT, WHICH MAY HELP TO DISLODGE THE OBSTRUCTION.

SCREEN CONTROLS PROVIDED BY PARKSON CORPORATION ARE NOT SUPPLIED WITH THE PROVISION FOR REVERSING THE SCREEN. IF CUSTOMER-SUPPLIED CONTROLS HAVE THE PROVISION FOR REVERSING THE SCREEN (E.G. THROUGH A REVERSING STARTER OR A VFD), THEN THE SCREEN MUST ONLY BE JOGGED IN REVERSE, AND EXTREME CAUTION MUST BE EXERCISED WHEN DOING SO TO PREVENT DAMAGE TO THE SCREEN OR INJURY TO PERSONNEL. THE SCREEN MUST NOT BE ALLOWED TO RUN CONTINUOUSLY IN REVERSE.

FOR ALL PROCEDURES DESCRIBED BELOW THAT ALLOW ACCESS TO THE SCREEN BELT OR ROTATING BRUSH, THE POWER SUPPLY TO THE SCREEN AND BRUSH DRIVES MUST BE PROPERLY LOCKED OUT BEFORE REMOVING ACCESS COVERS.

Adjusting Brush Position

NOTE: **The rotating brush and screen spray system work together to clean the screen belt. If the screen panels are not being cleaned properly, check the operation of the screen spray first. Then, either adjust the brush inward to increase brush contact pressure, or replace the brush.**

NOTE: **The tips of the bristles should be making good contact with the screen panels. Proper brush contact will vary per the application requirements. Each screen panel has a 'shelf' that is approximately 2 inches deep. Typically, with a new brush, the fully extended brush bristles should extend ~75% into the depth of the screen panel shelf (i.e. the tips of the bristles should extend approximately 1.50 inches past the protruding edge of the panel).**

Another check to confirm and monitor the brush position is the distance from brush shaft centerline to screen shaft centerline. When this measurement is 19.50 inches, the tips of a new brush can reach the gap between adjoining screen panels. For a new brush, the brush shaft should not be less than 19.50 inches from the screen shaft. New brush bristles should not extend into the gap between adjoining screen panels, as this may cause the brush and the screen belt to bind.

As the brush wears, the bristles become more flexible, and the brush can be adjusted further into the screen belt to improve screen belt cleaning. However, the brush motor amp draw must not exceed the brush motor nameplate Full Load Amps.

Note that, while further inward adjustment of the brush may improve screen belt cleaning, the rate of brush wear increases as the brush is adjusted further inward. To optimize the life of the brush, adjust the brush to meet the above criteria and provide an acceptable degree of screen belt cleaning.

Each brush drive shaft bearing is mounted on a slotted take-up bracket. On the drive end, the drive torque arm is also secured to the take-up bracket. Adjustment of the brush position only requires adjustment of the take-up brackets and take-up bracket gaskets (see Fig 6A).

Lock out power to the screen and brush motors.

Confirm that there is sufficient slack in the motor power connection. If not, wiring must be disconnected from the motor.

Loosen the nuts on the slotted brush take-up brackets.

Brush take-up bracket gaskets are provided on the unit to minimize leakage from the brush shaft slots. These gaskets are sandwiched between the take-up bracket and the screen frame. Loosen the take-up bracket gaskets. The gaskets should move freely with the take-up brackets as the take-up brackets are being adjusted. If necessary, apply a spray lubricant between the gasket and the brush shroud and use a putty knife to loosen the gasket from the brush shroud.

Loosen the locking nuts on the jacking screws.

Turn the jacking nuts to move the take-up brackets to the desired location. Make sure that the take-up adjustment is made equally on both brackets. Also, use caution to prevent the take-up bracket gaskets from distorting during adjustment.

When adjusting the brush closer to the screen belt, make small changes. Turn on power to the brush motor and jog the brush motor to check the brush rotation and brush contact. If further adjustments are required, lock out power to the brush motor and repeat the adjustment procedure.

After final adjustments, tighten the take-up nuts on each take-up bracket, and tighten the locking nuts to secure the position of the jacking bolts.

If the motor power connection was removed, reconnect the motor wiring and conduit.

Turn the brush motor on to confirm that the brush is rotating smoothly. Check the amp draw on the brush motor and confirm that the motor is not being overloaded.

Replacing Brush

NOTE: **The rotating brush and screen spray system work together to clean the screen belt. If the screen panels are not being cleaned properly, check the operation of the screen spray first. Then, either adjust the brush inward to increase brush contact pressure, or replace the brush.**

Brush cleaning effectiveness is the best indicator when assessing if the brush requires replacement. The fullness and stiffness of the brush bristles are equally important as the brush contact in cleaning the perforated screen panels.

The brush assembly consists of nylon strip brushes mounted in a split aluminum core, a stainless steel shaft, aluminum mounting flanges and locking lugs, and stainless steel fasteners. Mounting flanges are positioned along the length of the shaft, and the brush halves (split cores with brush strips) are secured to the flanges using the locking lugs and fasteners (see Fig 6A).

Replacement of the brush only requires removal of the locking lugs and cores. The shaft, mounting flanges, bearings and drive remain in place.

NOTE: **Under normal operating conditions, the brush drive shaft and mounting flanges do not need to be replaced when adjusting or changing the brush. However, if the drive shaft or any of the mounting flanges have been damaged, they must be repaired or replaced. Contact Parkson Corporation for further instruction.**

Lock out power to the screen and brush motors.

Remove the locking lugs and fasteners that secure the split core halves to the mounting flanges.

Remove the split core brush halves. Brush strips are crimped on the brush cores; cores are not intended to be reused.

Clean the mounting flanges and check the condition of the tapped holes in the flanges. Chase threads if the threads are not clean, or if there is evidence that the threads may be damaged.

Clean debris off the locking lugs to ensure that they seat properly when they are re-installed on the new brush.

Clean debris off the bolts and lock washers and use anti-seize on the bolt threads when re-installing.

Rotate the shaft and platform so that the row of tapped holes on the mounting flanges is facing outward toward the operators, at ~10 o'clock or 2 o'clock position.

Before lifting the brush halves into position, use vice grips to squeeze the aluminum channels in the areas where the locking lugs will be placed. This will aid in seating the locking lug into the core channels.

Place the first brush half on the top side of the shaft. If the screen belt is jogged to the right position, the brush will cradle itself in the recessed portion of a panel, which will make installation easier.

Place two bolts into the mounting flanges to act as a locating stop for the brush halves. For this purpose, do not use the lock washers that are provided with the bolts.

Adjust the brush half so that it contacts the two locating bolts, and make sure that it is contacting the mounting flanges all around. Center the brush on the shaft and confirm that the tapped holes on the mounting flanges are centered in the areas of the brush where the locking lugs will be installed (a portion of the brush will be removed to allow for fit of the locking lug).

Lift the second brush half into the screen and place it on the bottom side of the shaft. Use a 2x4 under the second brush half to prop up the brush while the brush is being positioned onto the mounting flanges. Once the first row of locking lugs is installed, it will not be necessary to prop up the brush.

Position the second brush half so that it contacts the locating bolts and makes contact with the platform all around. Center the brush on the shaft and confirm that the tapped holes on the mounting flanges are centered in the areas of the brush where the locking lugs will be installed (a portion of the brush will be removed to allow for fit of the locking lug).

With the two brushes on the platform, the space between the brush halves should be just enough to allow the locking lug bolts to fit in (i.e. the tapped holes in the mounting flanges should be visible).

Install the first row of locking lugs and bolts so that they are snug, but not fully tightened. Install locking lugs first where there are no locating bolts. Then, remove one locating bolt at a time, and install a locking lug in its place. Use anti-seize compound on the threads of all bolts, and the high collar lock washers that are provided with these bolts. If there is resistance when installing a locking lug bolt before the bolt makes contact with the locking lug, do not force the bolt. Remove the bolt, tap the hole, and install the bolt again. Use a new bolt if necessary.

NOTE: **The brush mounting flanges are made of aluminum. Use care when tightening the locking lug bolts so as not to strip the threads in the mounting flanges. All locking lugs must be used to properly secure the brush cores to the mounting flanges. Mounting flanges with damaged threads must be repaired or replaced.**

With the first row of locking lugs in place (snug, but not fully tightened), manually turn the brushes 180 degrees so that the second row of locking lugs can be installed.

Install the second row of locking lugs, using anti-seize compound on the threads of all bolts, and the high collar lock washers that are provided with these bolts.

After all locking lugs in the second row are installed (snug, but not fully tightened), secure the bolt on each locking lug. Rotate the brush 180 degrees and secure the bolt on each locking lug in the first row. Each locking lug must be properly seated AND fully tightened before restarting the brush.

It is important to make sure that the edges of each locking lug are seated into a channel, as this proper seating will draw the core tightly down into its proper position. The edge of the locking lug must not rest on top of a core channel. Anti-seize can be added to the edges of the lugs to assist in getting the edges to seat in the channels.

If a locking lug is not completely seated, but the locking lug bolt is tight, the locking lug can be seated by striking the lug with a punch. A lug that is not properly or completely seated will move when struck with a punch. After striking the lug, tighten the bolt further. This process can be repeated until the lug is properly and completely seated. This should be done to each locking lug at least once, even if it looks like the lug is completely seated.

Turn the brush motor on to confirm that the brush is rotating smoothly. Adjust the position of the brush for optimum brush contact, as required. Check the amp draw on the brush motor and confirm that the motor is not being overloaded. Checking brush motor amp draw is particularly important with a new brush where the bristles are stiff and have not worn in yet.

Removing Brush Drive Gear Reducer

Lock out power to the screen and brush motors.

Remove the protective cover on the gear reducer taper bushing locking collar (see Fig 6A and gear reducer manufacturer's instructions in Section Nine).

Loosen the bolts on the locking collar and release the taper engagement with the drive shaft. Locking collar bolts must be loosened in a specific pattern; carefully follow the manufacturer's taper bushing removal instructions in Section Nine of this Manual.

Remove the torque arm mounting bolt, nut, washers, and rubber bushings. This will allow the gear reducer to be separated from the brush take-up bracket. It is not necessary to remove the torque arm from the gear reducer.

Pull the gear reducer off the drive shaft, making sure that the drive is properly supported and does not fall once it is off the shaft. If necessary, use a beam style bearing puller to assist in the removal of the gear reducer.

Replacing Brush Drive Gear Reducer

Confirm that the torque arm is properly secured to the gear reducer.

Clean the end of the brush drive shaft with solvent; use emery cloth or a file to remove high spots and burrs. DO NOT APPLY a lubricant or anti-corrosion agent to the shaft before mounting the gear reducer; shaft must be clean and dry to ensure that the taper bushing is properly secured to the drive shaft (see Fig 6A and gear reducer manufacturer's instructions in Section Nine).

Carefully following the manufacturer's taper bushing installation instructions in Section Nine of this Manual, mount the taper bushing in the gear reducer.

Make sure that the gear reducer is well supported as it is being installed, so that it can be properly aligned with the brush drive shaft. This will prevent damage to the shaft and taper bushing, and ease installation of the gear reducer.

Push the gear reducer onto the shaft until the torque arm bolt hole aligns with its mating holes on the brush take-up bracket.

Fasten the torque arm to the take-up bracket with the torque arm bolt, nut, flat washers, and rubber bushings. Apply LocTite 242 medium duty thread locker to the threads of the torque arm bolt to prevent the bolt from loosening. Do not fully tighten the torque arm bolt, or otherwise secure the torque arm firmly to the take up bracket; the torque arm is designed with rubber bushings to move slightly when the drive is under load. In their installed position, the rubber bushing must be able to rotate by hand. Replace the rubber bushings if they are damaged.

Secure the position of the drive on the shaft by fastening the locking collar bolts. Locking collar bolts must be tightened in a specific pattern; carefully follow the manufacturer's taper bushing installation instructions in Section Nine of this Manual.

Mount the bushing cover on gear reducer.

Turn on power and jog the brush drive motor for several rotations to confirm that the drive is not binding.

Replacing Brush Drive Shaft Bearings

When changing the brush shaft bearings, it is recommended to also change the take-up bracket gaskets (see Fig 6A).

When the brush shaft bearing on the drive end requires replacing, the gear reducer must first be removed. Follow instructions for the removal and replacement of the brush gear reducer.

Lock out power to the screen and brush motors.

If provided on the unit, remove the flexible grease line into the brush shaft bearing.

Remove the nuts that secure the take-up bracket to the screen frame.

Loosen the locking nuts that secure the position of the jacking screws.

Loosen the two (2) bearing setscrews.

Remove the bearing and take-up bracket together. Use a beam style bearing puller to assist in the removal of the bearing and the take-up bracket. Slowly pull the take-up bracket away from the screen frame. The brush shaft will slide out of the bearing and will rest in the screen frame opening. The worn take-up bracket gasket should also be removed.

Remove the bearing from the take-up bracket.

Remove the grease fitting from the old bearing, and install it on the new bearing.

Clean both sides of the take-up bracket.

Install the new bearing onto the bracket, ensuring that the grease fitting is in its correct position. Tighten the bearing nuts.

If a spray adhesive is available, apply it to the backside of the take-up bracket, and firmly press the new take-up bracket gasket to the bracket. Otherwise, simply install the take-up bracket gasket between the bracket and the screen frame.

Clean the end of the brush drive shaft with solvent; use emery cloth or a file to remove high spots and burrs that could damage the new bearing.

Clean the screen frame in the area where the take-up bracket will be installed. DO NOT APPLY an adhesive between the screen frame and the take-up bracket gasket. The gasket must move with the bracket when adjusting the brush position.

Apply Dow Corning Molykote (or similar anti-corrosion agent) to the shaft.

Place the take-up bracket onto the end of the drive shaft and push the bracket toward the screen frame onto the take-up bracket bolts. The brush drive shaft must be lifted slightly in order to align it with the shaft bearing.

Reposition the jacking screw locking nuts to allow the screw to fit in the jacking screw block on the screen frame. There should be one locking nut on each side of the block.

Confirm the correct position of the take-up bracket and tighten the take-up bracket nuts.

Tighten the jacking screw lock nuts to secure the position of the jacking screws.

Tighten the bearing set screws.

On the drive end of the brush drive shaft, after installation of the bearing, thoroughly clean the exposed shaft and install the brush drive gear reducer.

Turn on power and jog the brush motor to confirm that the bearing runs smoothly.

If provided on the unit, install the flexible grease line. With the brush running, add a small amount of grease to ensure that the lube line and bearing cavity are full of grease.

Removing Screen Drive Gear Reducer

Lock out power to the screen and brush motors.

Remove the protective cover on the gear reducer taper bushing locking collar (see Fig 6E and gear reducer manufacturer's instructions in Section Nine).

Loosen the bolts on the locking collar and release the taper engagement with the drive shaft. Locking collar bolts must be loosened in a specific pattern; carefully follow the manufacturer's taper bushing removal instructions in Section Nine of this Manual.

Remove the torque arm mounting bolts and washers. Smaller drives are provided with a single bolt torque arm; larger drives are provided with a two-bolt torque arm.

Pull the gear reducer off the drive shaft, making sure that the drive is properly supported and does not fall once it is off the shaft. If necessary, use a beam style bearing puller to assist in the removal of the gear reducer.

NOTE: **When the screen drive reducer includes two stages of gear reduction, it may be possible to service the input stage without removing the output stage from the screen drive shaft. Carefully read and follow the manufacturer's directions for dismantling the input stage from the output stage.**

Replacing Screen Drive Gear Reducer

Confirm that the torque arm is properly secured to the gear reducer.

Clean the end of the screen drive shaft with solvent; use emery cloth or a file to remove high spots and burrs. DO NOT APPLY a lubricant or anti-corrosion agent to the shaft before mounting the gear reducer; shaft must be clean and dry to ensure that the taper bushing is properly secured to the drive shaft (see Fig 6E and gear reducer manufacturer's instructions in Section Nine).

Carefully following the manufacturer's taper bushing installation instructions in Section Nine of this Manual, mount the taper bushing in the gear reducer.

Make sure that the gear reducer is well supported as it is being installed, so that it can be properly aligned with the screen drive shaft. This will prevent damage to the shaft and gear reducer bushing, and ease installation of the gear reducer.

Push the gear reducer onto the shaft until the torque arm contacts the screen frame (two bolt torque arm design) or torque arm retainer (single bolt torque arm).

Fasten the torque arm to the screen frame (two bolt torque arm design) or to the torque arm retainer (single bolt torque arm design) with the torque arm bolts and washers. Apply LocTite 242 medium duty thread locker to the threads of the torque arm bolts to prevent the bolts from loosening.

Secure the position of the drive on the shaft by fastening the locking collar bolts. Locking collar bolts must be tightened in a specific pattern; carefully follow the manufacturer's taper bushing installation instructions in Section Nine of this Manual.

Mount the bushing cover on gear reducer.

Turn on power and jog the screen drive motor for several rotations to confirm that the drive is not binding.

Replacing Screen Drive Shaft Bearings

Replacing screen drive bearings is considered a major overhaul procedure. Contact the Parkson Corporation Service Department for this overhaul procedure.

When this procedure is required, it is generally recommended that both screen drive shaft bearings be changed at the same time.

The condition of the drive shaft and sprockets should also be assessed at this time. If the complete screen drive shaft must be replaced or refurbished, then both screen drive shaft bearings should be changed when the drive shaft is re-installed in the screen.

Checking & Cleaning Guarded Screen Drive Shaft Bearings

When the screen drive shaft bearing areas are guarded to retain splashing and odors, the screen drive shaft bearing guards must be periodically removed for inspection and cleaning of the bearing areas.

Lock out power to the screen motor.

Remove the bearing guards. Assess the condition of gaskets and seals, and discard gaskets and seals that are worn or damaged. In general, it is recommended to replace all gaskets and seals.

Remove accumulated debris from the bearing areas.

Wash down the bearing areas and bearings. To prevent damage to the screen drive shaft bearing, do not use high-pressure water in this area.

Check external condition of the screen shaft bearings. If there is evidence of damage to the bearing housing or seals, bearing may need to be replaced.

Dry fit the new drive end guard seal. The drive end guard seal requires on-site fit up and trimming to accommodate the current position of the screen drive shaft.

Install the bearing guards, liberally applying silicone sealant between mating pieces to eliminate leaks.

Replacing Perforated Screen Panels

Remove the screen frame access panel on each side of the screen frame (see Fig 2A). The screen frame access panels are located on the upstream side of the screen frame, just underneath the screen drive.

Jog the screen motor until the screen panel that requires replacement is in view through the access ports.

Lock out power to the screen motor.

Remove the upstream cover panel(s) adjacent to the access openings.

The screen panel to be removed must be externally constrained before removing panel screws. This can be accomplished by tying a pliable wire to the screen panel and to a stationary part of the screen. This should be done at each end of the screen panel. Constraining the panel will allow the operator to focus on handling and removing the side plates and fasteners from the screen belt, and prevent the panel from falling into the center of the screen belt.

Remove the screws that secure the screen panel to the chains (two screws on each end of a panel) (see Fig 6D). Use caution when removing these screws, as heavy-duty thread locker has been applied to the screw threads. Trying to force the screw loose may result in stripping of the screw head. Using a 3/8" socket drive, attempt to remove the screw. If the screw does not turn, use a propane torch to apply localized heat to the screw head to break the bond created by the thread locker.

NOTE: **Use caution when removing screen panel mounting screws to prevent dropping the screws or side plates inside the screen belt. It is advisable to have spare screws and side plates on hand before performing this procedure, in the event these items are accidentally dropped.**

Remove the screen panel side plates. Side plates and fasteners can be reused, if there is no evidence of damage.

Remove the securing wires from the stationary part of the screen and lift the screen panel out of the screen belt.

When installing a new screen panel, position the panel on the screen belt and constrain the panel using pliable wires. This will allow the operator to focus on handling and installing the side plates and fasteners to the screen panel, and prevent the panel from falling into the center of the screen belt.

Fasten the replacement screen panel, spacers, and side plates to the chains. Use LocTite 271 heavy duty thread locker on clean screw threads to prevent the threads from loosening during operation.

NOTE: **The side plates must be overlapped in a specific orientation to ensure that the screen belt travels without obstruction. The leading edge of each side plate must be on the outside of the adjacent side plate, and the trailing edge of each side plate must be on the inside of the adjacent side plate. Reversing this orientation will damage the side plates, and may damage screen panels, chains and other screen components.**

Lock washers are not provided on the screen panels. To secure the position of screen panel fasteners and prevent them from becoming loose and possibly falling out, screen panel fasteners must be re-assembled with LocTite 271 heavy-duty thread locker. Thread locker must be used any time the screen panel fastener is removed for servicing, or if it is observed that the bolt has become loose.

Screen panel screws should be tightened to a torque of 15 to 20 ft-lb.

Turn power to the screen motor on, and jog screen motor to confirm that the screen belt travels smoothly throughout its cycle.

Install the cover panels and access panels.

Replacing Side Plates

Refer to the Replacing Perforated Screen Panel procedure for details on replacing the screen panel side plates.

Even though the screen panel is not being replaced, the panel must be externally constrained before removing panel screws. Constraining the panel with pliable wires will allow the operator to focus on handling the side plates and fasteners from the screen belt, and prevent the panel from falling into the center of the screen belt.

NOTE: **The side plates must be overlapped in a specific orientation to ensure that the screen belt travels without obstruction. The leading edge of each side plate must be on the outside of the adjacent side plate, and the trailing edge of each side plate must be on the inside of the adjacent side plate. Reversing this orientation will damage the side plates, and may damage screen panels, chains and other screen components.**

Inspecting Screen Belt Tension

The screen belt should track smoothly throughout its travel cycle without binding or jerking, and should have some slack to prevent accelerated wear.

The screen belt will have slight yet noticeable sag between the points where it leaves the downstream guide rails and where it enters the bottom turnaround. This is typically the area of the screen belt that is just below the top of the channel on the downstream side of the screen. In this area, the screen belt should flex when pushed inward toward the center of the screen frame.

It is best to confirm proper belt tension by inspecting the belt as it enters into the bottom 180-degree turn. Ideal screen tension will allow the rollers on the screen belt chains to enter the bottom turnaround without contacting the leading edges of either the half moon shaped bottom guide rail or the lower safety rail at the bottom of the screen (see Fig 6R).

Close upstream and downstream slide gates to isolate the screen. Drain water from channel.

If the screen belt is tightened such that the rollers on the screen belt chains are contacting the entire 180 degrees on the bottom return guide rail (half moon shaped rail), the tension is too tight. Overtensioing of the screen belt will accelerate wear and may damage the screen.

If the screen belt sags such that the rollers on the screen belt chains are hitting the leading edge of the lower guide rail, the tension is too loose. Excessive sag of the screen belt may bind the screen belt and may damage the screen.

In between full inspections of the belt tension, daily observation of the screen belt operation provides a good indirect indication of screen belt tension. Unusual noises or screen belt jerking should be investigated immediately.

CAUTION

IF THE SCREEN BELT IS OVER TIGHTENED, THE SCREEN BELT CHAINS AND BOTTOM GUIDE RAILS WILL EXPERIENCE ACCELERATED WEAR AND SCREEN COMPONENTS MAY BE DAMAGED. THE SCREEN BELT SHOULD HAVE SOME SLACK TO PREVENT THIS CONDITION (SEE FIG 6R).

EXCESSIVE SAG OF THE SCREEN BELT SHOULD ALSO BE AVOIDED (SEE FIG 6R), AS THIS CAN CAUSE THE SCREEN BELT TO BIND, WHICH MAY DAMAGE THE SCREEN BELT AND OTHER SCREEN COMPONENTS.

Adjusting Screen Belt Tension

The screen drive shaft take-up screws are used to adjust screen belt tension and alignment (see Fig 6E).

Lock out power to the screen motor.

Confirm that there is sufficient slack in the motor power connection. If not, wiring must be disconnected form the motor.

Identify the adjustment nuts and stop nuts on the unit. The adjustment nuts are the acme nuts that are in contact with the take-up bracket spacers; the other nuts are stop nuts in that they lock the position of the adjustment nuts and adjustment screw

Loosen the stop nuts on each take-up screw.

On a two-bolt torque arm design (torque arm secured to the screen frame), loosen the two (2) torque arm bolts that secure the torque arm to the screen frame.

On a single bolt torque arm design (torque arm secured to the torque arm retainer), the torque arm and retainer will travel with the drive and shaft as the adjustment is being made; there is no need to loosen or remove the torque arm bolt.

Turn the adjustment nut, clockwise to increase the belt tension, counterclockwise to loosen the belt tension. Take-up rails on the screen frame guide the take-up bearings and drive. When adjusting the screen belt, make small changes. Adjust screen drive shaft position to provide the proper screen belt tension.

Using the exposed jacking screw distance above the adjusting frame, check for even alignment. The measured distance should be within +/-1/8” of each other. However, if the chain has stretched unevenly, it may be necessary to adjust one jacking screw more than the other. Proper alignment of the screen belt within the frame is the over riding parameter to observe.

Tighten the stop nuts.

For a two-bolt torque arm, tighten the torque arm bolts.

If the motor power connection was removed, reconnect the motor wiring and conduit.

Turn power on and jog the screen motor to confirm that the screen belt is not binding. Then, run the unit continuously to confirm smooth travel throughout its cycle.

If binding or jerking still exists, or if screen belt tension is not correct, repeat the checks and adjustments until the problem is corrected.

Inspecting Screen Belt Chains

Over the life of the screen, the screen belt chains will experience wear between the chain components and between the rollers and guide rails (see Fig 6D). The chain should be replaced if the rollers develop flats deep enough to allow the chain sidebars to drag on the rails or rail supports.

Replacing Screen Belt Chains

Replacing screen belt chains is considered a major overhaul procedure. Contact the Parkson Corporation Service Department for this overhaul procedure.

The screen panels on the screen belt are mounted to and driven by two sets of matching roller chains. To ensure proper screen belt alignment and tracking, the two sets of chains should be changed at the same time.

Inspecting Guide Rails

The stationary guide rails typically should be replaced before they have worn enough to allow the chain rollers or chain side plates to come in contact with the rail supports. As a general rule, guide rails should be replaced when any point of the rail reaches a thickness of less than 3/8". Noticeable wear of the chain side plates is an indication that the rails may be in need of replacement.

The bottom guide rails provide the change in screen belt travel direction and are subject to greater wear. The lower upstream guide rails, which are short guide rail sections located adjacent to the bottom return guide rails, are also subject to greater wear as the screen belt completes its transition to a linear travel (see Fig 2A). Procedures for replacing these change-in-direction rails are detailed below.

Replacement of the remaining straight guide rails is generally addressed as part of a screen overhaul; contact the Parkson Corporation Service Department for straight guide rail replacement procedures.

Replacing Bottom Guide Rails

This procedure typically is performed at the same time as the replacement of the lower upstream guide rails to ensure that the transition from the curved bottom rails to the straight upstream rails is smooth. Left Hand and Right Hand bottom guide rails should be changed at the same time.

Lock out power to the screen and brush motors.

Close upstream and downstream slide gates to isolate the screen. Drain water from channel.

Remove six screen panels from the screen belt (see Replacing Perforated Screen Panel procedure). The screen panels can be removed without disassembling the chains. Two side plates will also be removed along with each screen panel.

Turn power on and run the screen belt to position the opening in the screen belt near the bottom return rails (see Figs 2A & 6R). Opening should allow access to the bottom return rails from either the upstream or the downstream side of the screen.

Again, lock out power to the screen and brush motors.

Wedge a 2x4 between the channel floor and the screen panel above the opening in the screen belt as a safety precaution.

⚠ DANGER ⚠

SERVICE PERSONNEL WILL BE REACHING INTO THE SCREEN BELT TO SERVICE THE BOTTOM RETURN RAILS. THE SCREEN DRIVE MUST BE PROPERLY LOCKED OUT TO ENSURE THAT THE SCREEN IS NOT ACCIDENTALLY STARTED WHILE THIS PROCEDURE IS BEING PERFORMED. STARTING OF THE UNIT WHILE THIS PROCEDURE IS BEING PERFORMED WILL RESULT IN BODILY HARM AND DAMAGE TO THE EQUIPMENT.

Remove the bolts and washers that secure the bottom guide rails to the screen frame. Remove the worn bottom return rails.

By removing six continuous screen panels from the screen belt, there should be enough slack in the chain to remove the bottom guide rails. If more chain slack is required, the screen belt tension can be adjusted. Note the position of the belt tension before adjusting, as the screen belt must be re-tensioned after replacement of the bottom guide rails.

Chase the threads in each bottom guide rail spacer with a 5/8”-11 UNC tap to ensure that the threads are clean and will not seize the bottom guide rail bolts. Use new bottom guide rail bolts if the existing bolts appear to be damaged.

Apply anti-seize to the threads of each bottom guide rail bolt and fasten the replacement guide rails to the screen frame. Make sure that lock washers are used to prevent the bottom return guide rail bolts from loosening. Replace both bottom guide rails to ensure smooth screen belt travel.

Confirm that there is a smooth transition between the new bottom guide rails and the lower upstream guide rails. If not, grind the rails to remove sharp edges.

Remove the 2x4 wedge.

If belt tension was slackened, adjust belt tension to its prior setting.

Turn on power to the screen motor and jog the screen motor to check for smooth travel of the screen belt.

Run the screen belt to position the opening in the screen belt at the access panel openings.

Again, lock out power to the screen and brush motors.

Reassemble the removed screen panels, making sure that the spacers and side plates are properly installed, and that LocTite 271 heavy-duty thread locker is used on the threads of the screen panel screws.

Turn on power to the screen motor and jog the screen motor to check for smooth travel of the screen belt.

Replacing Lower Upstream Guide Rails

This procedure typically is performed at the same time as the replacement of the bottom turn guide rails to ensure that the transition from the curved bottom rails to the straight upstream rails is smooth. Left Hand and Right Hand lower guide rails should be changed at the same time.

Lock out power to the screen and brush motors.

Close upstream and downstream slide gates to isolate the screen. Drain water from channel.

Remove six screen panels from the screen belt (see Replacing Perforated Screen Panel procedure). The screen panels can be removed without disassembling the chains. Two side plates will also be removed along with each screen panel.

Turn power on and run the screen belt to position the opening in the screen belt near the lower upstream guide rails (see Figs 2A & 6R). Opening should allow access to the lower upstream guide rails from the upstream side of the screen.

Again, lock out power to the screen and brush motors.

Wedge a 2x4 between the channel floor and the screen panel above the opening in the screen belt as a safety precaution.

⚠ DANGER ⚠

SERVICE PERSONNEL WILL BE REACHING INTO THE SCREEN BELT TO SERVICE THE LOWER UPSTREAM GUIDE RAILS. THE SCREEN DRIVE MUST BE PROPERLY LOCKED OUT TO ENSURE THAT THE SCREEN IS NOT ACCIDENTALLY STARTED WHILE THIS PROCEDURE IS BEING PERFORMED. STARTING OF THE UNIT WHILE THIS PROCEDURE IS BEING PERFORMED WILL RESULT IN BODILY HARM AND DAMAGE TO THE EQUIPMENT.

Remove the nuts, bolts and washers that secure the lower upstream guide rails to the screen frame.

Remove the worn lower upstream guide rails.

Apply LocTite 271 heavy-duty thread locker to the threads of the lower upstream guide rail bolts and fasten the replacement guide rails to the screen frame.

Confirm that there is a smooth transition between the bottom guide rails and the lower upstream guide rails, and between the lower upstream guide rails and the upper upstream guide rails. If not, grind the rails to remove sharp edges.

Remove the 2x4 wedge.

If belt tension was slackened, adjust belt tension to its prior setting.

Turn on power to the screen motor and jog the screen motor to check for smooth travel of the screen belt.

Run the screen belt to position the opening in the screen belt at the access panel openings.

Again, lock out power to the screen and brush motors.

Reassemble the removed screen panels, making sure that the side plates are properly installed, and that LocTite 271 heavy-duty thread locker is used on the threads of the screen panel screws.

Turn on power to the screen motor and jog the screen motor to check for smooth travel of the screen belt.

Replacing Front Seals (Inner & Outer)

The outer front seals provide sealing between the screen frame and channel walls, while the inner front seals provide sealing between the screen frame and screen belt side plates. Both seals are fastened to screen frame with a common mounting bracket (see Figs 6G and 6L).

Lock out power to the screen motor.

Close upstream and downstream slide gates to isolate the screen. Drain water from channel.

Remove the nuts and washers that secure the front seal mounting bracket to the screen frame.

Remove the front seal mounting bracket, which has the inner seal fastened to it.

Remove the outer seal, which is sandwiched between the front seal mounting bracket and the screen frame.

NOTE: **If the Outer Front Seal and the Outer Corner Seal are provided as one continuous piece, the Corner Seal Bracket must first be removed before the Outer Seal can be replaced. Follow the Replacing Corner Seals (Inner & Outer) instructions to remove the Corner Seal Bracket.**

Replace the inner seal on the mounting bracket, using the existing fasteners and backer bars.

Install the new outer seal. The outer seal should overlap the concrete wall enough to bend the free edge of the outer seal upward. This will allow the outer seal to maintain positive contact with the wall during flow conditions.

Position the front seal mounting bracket over the outer seal and tighten the nuts to secure the bracket and outer seal. The mounting bracket should be adjusted so that the side of the inner seal makes only slight contact with the screen panel side plates. The free edge of the inner seal should also be within ¼" of the leading edge of the screen panels, but should not be touching the screen panels; making contact with the panels will cause the inner seal to buckle and allow screenings to wedge between the seal and the panels.

Recheck the position of the inner and outer seals after all fasteners are tightened.

Confirm that the transition from the front seals to the corners seals is smooth and without gaps.

Repeat the procedure for the opposite side front seal.

Turn on power to the screen motor and run the screen belt to confirm smooth operation of the screen belt and proper fit of the front seals.

Replacing Corner Seals (Inner & Outer)

The corner seals are essentially extensions of the front seals. The outer corner seals provide sealing between the screen frame and channel walls. The inner corner seals provide sealing between the screen frame and screen belt side plates as well as between the screen frame and the bottom seal. Both seals are fastened to screen frame with a common mounting bracket (see Fig 6G and Fig 6M).

Lock out power to the screen motor.

Close upstream and downstream slide gates to isolate the screen. Drain water from channel.

Remove the nuts and washers that secure the corner seal mounting bracket to the screen frame.

Remove the corner seal mounting bracket, which has the inner seal fastened to it.

Remove the outer seal, which is sandwiched between the seal mounting bracket and the screen frame.

NOTE: **If the Outer Front Seal and the Outer Corner Seal are provided as one continuous piece, the Corner Seal Bracket must first be removed before the Outer Seal can be replaced. Follow the Replacing Corner Seals (Inner & Outer) instructions to remove the Corner Seal Bracket.**

Replace the inner seal on the mounting bracket, using the existing fasteners and backer bars. Note that the inner corner seal is cut larger than necessary so that it can be field cut to provide an optimum fit.

Install the new outer seal. The outer seal should overlap the concrete wall enough to bend the free edge of the outer seal upward. This will allow the outer seal to maintain positive contact with the wall during flow conditions.

Position the corner seal mounting bracket over the outer seal and tighten the nuts to secure the bracket and outer seal. The mounting bracket should be adjusted so that the side of the inner seal makes only slight contact with the screen panel side plates. The inner seal should be trimmed so that the free edge of the inner seal is within ¼" of the leading edge of the screen panels, but not be touching the screen panels; making contact with the screen panels will cause the inner seal to buckle and allow screenings to wedge between the seal and the panels.

When trimming the inner corner seal to fit the path of screen belt travel, make small cuts to ensure that the gap between the leading edge of the screen panels and the free edge of the seal is not excessive (gap < ¼").

Recheck the position of the inner and outer seals after all fasteners are tightened.

Confirm that the transition from the front seals to the corners seals is smooth and without gaps.

Repeat the procedure for the opposite side corner seal.

Turn on power to the screen motor and run the screen belt to confirm smooth operation of the screen belt and proper fit of the corner seals.

Replacing Bottom Seal

The bottom seal is a rubber seal sandwiched between two backing plates, which is fastened to the upstream side of the screen frame at its base (see Fig 6G and Fig 6N). The seal prevents material from passing under the screen belt during its 180-degree turn at the base of the unit.

Lock out power to the screen motor.

Close upstream and downstream slide gates to isolate the screen. Drain water from channel.

Remove the nuts and washers that secure the bottom seal and backing plates to the screen frame. The studs that extend out from the base of the screen frame are welded to the screen frame and will not be removed.

Remove the front backing plate and bottom seal. It may be necessary to loosen the fasteners on the corner seal brackets, and move these seals outward to provide clearance for removing the backing plate and bottom seal.

Confirm that the replacement bottom seal is of the same length as the original seal. Trim the seal if necessary for a good fit. The free edge of the bottom seal should make contact with the traveling screen belt at all times. The sides of the bottom seal should be within ¼" of the corner seals, and should not buckle when the screen panels pass by the seal.

Install the new bottom seal using the existing hardware and backing plates. Replace hardware and backing plates if these parts are damaged.

If the corner seal brackets were repositioned to provide removal clearance for the bottom seal, adjust the position of the corner seal brackets and tighten the mounting fasteners.

Recheck the position of all seals after all fasteners are tightened.

Turn on power to the screen motor and run the screen belt to confirm smooth operation of the screen belt and proper fit of the bottom seal.

Replacing Chute Seal

Lock out power to the screen and brush motors. If the screen discharges screenings into a powered device (conveyor, washer, compactor, etc.), lock out power to that device as well. Removal and replacement of the chute seal requires an operator to be positioned in the screenings discharge area.

Remove accumulated screenings from the chute seal (see Fig 6P).

Remove the fasteners that secure the seal retainer and chute seal to the chute. The nuts that secure the chute seal bolts are welded to the backside of the chute.

Remove the retainer and seal. A silicone sealant had been applied between the chute seal and the chute and splash guard. It will likely require some effort to break the silicone free.

Remove old and dried silicone from the chute and splash guard. It is not necessary to remove the splash guard. Clean the area where the new chute seal will be installed.

Place the new chute seal and confirm its fit before securing the seal to the chute. Adjust or trim the seal so that its free end is within ¼" of the path of the screen panels, and the sides are within ¼" of the screen belt side plates.

Liberally apply silicone sealant to the chute and splash guard in the area where the chute seal will be mounted.

Place the chute seal onto the chute and secure the chute seal with the retainer and fasteners.

Turn on power to the screen motor and run the screen belt to confirm that the screen belt does not contact the chute seal.

Cleaning / Replacing / Adjusting Spray Nozzles

Clogged or worn nozzles, or improperly adjusted nozzles, will decrease the cleaning effectiveness of the spray systems.

Check for an even spray pattern, equal distribution across the width of the header and correct pattern position (see Fig 6H or Fig 6J). To view the screen spray pattern, open the screen frame access panels.

If the nozzles appear to be in good condition, but the spray pattern is simply not aimed correctly (i.e. not directing the spray pattern correctly onto the screen or the brush), then it is only necessary to loosen the collars on the header mounting flanges and rotate the header to its correct position.

If there is evidence of nozzle clogging or nozzle wear (uneven spray pattern), then the header must be removed to properly inspect and service the nozzles.

To remove the screen spray header from the screen:

Lock out power to the screen and brush motor.

Disconnect water supply piping.

Note or mark the correct position of the header to ensure that the header is correctly reinstalled after servicing.

Remove the free (top) collar half from each header mounting flange.

Remove the mounting flange fasteners and each mounting flange and gasket.

Remove the header from the screen frame. Spray header may need to be pushed to one side of the header access hole on the screen frame to allow the nozzles to clear.

To confirm which nozzles require cleaning or replacing, it is recommended to connect the removed spray header to a water supply and observe the spray pattern for each nozzle. Installing one new nozzle before turning on the water supply will provide a means for gauging the performance of the other nozzles.

Note the position of the installed nozzles before removing nozzles for cleaning or replacing. It is recommended to leave at least one nozzle in the spray header to ensure that the cleaned or replaced nozzles are correctly installed.

Remove clogged or worn nozzles. Clean clogged nozzles with a piece of stiff wire and compressed air. Replace worn nozzles. When installing nozzles, use pipe tape to seal the nozzle threads. Offset the position of nozzles by approximately five degrees to prevent overlapping spray patterns of adjoining nozzles from impacting each other.

If possible, flush the spray header. Also, confirm that all nozzles are delivering a proper spray pattern, and that adjoining spray patterns do not strike each other.

Reinstall the spray header in the screen frame. The header pipe should extend the same distance past the screen frame on each end.

Reinstall the gaskets and mounting flanges, and secure these to the screen frame with the flange mounting bolts. Install new gaskets if the old gaskets are worn or damaged.

Place the free (top) collar half on the fixed (bottom) collar half and loosely fasten the collar bolts.

Apply silicone sealant between the collar joints and between the pipe and collar.

Confirm the correct position of the header, and then tighten the collar fasteners to secure the position of the header.

Before reconnecting the water supply, clean the in-line strainer (if provided) and flush the water supply line.

Reconnect the water supply piping, making sure that the header pipe position does not move.

Turn on the water supply. Check spray pattern and check for piping leaks.

NOTE: **If the screen spray header cannot be removed due to site or installation restrictions, the following procedure can be followed to clean, adjust, or replace nozzles on the screen spray header:**

⚠ DANGER ⚠

SERVICE PERSONNEL WILL BE REACHING INTO THE SCREEN BELT TO SERVICE THE SCREEN SPRAY HEADER. THE SCREEN DRIVE MUST BE PROPERLY LOCKED OUT TO ENSURE THAT THE SCREEN IS NOT ACCIDENTALLY STARTED WHILE THIS PROCEDURE IS BEING PERFORMED. STARTING OF THE UNIT WHILE THIS PROCEDURE IS BEING PERFORMED WILL RESULT IN BODILY HARM AND DAMAGE TO THE EQUIPMENT.

Lock out power to the screen and brush motors.

Remove two screen panels from the screen belt (see Replacing Perforated Screen Panel procedure). The screen panels can be removed without disassembling the chains. Two side plates will also be removed along with each screen panel.

Turn power on and run the screen belt to position the opening in the screen belt at the same elevation as the spray header.

Access to the spray header is available from the upstream side of the screen; note, however, that the nozzles are on the opposite side of the pipe when accessing the header from the upstream side.

Access to the spray header is also available from the downstream side of the screen; note, however, that this requires the operator to climb into the discharge area of the screen and that the rotating brush will impede access when accessing the header from the downstream side. It is recommended to access the spray header from the downstream side when the brush has been removed during brush replacement procedures.

Again, lock out power to the screen and brush motors.

Use caution when removing and installing nozzles to ensure that nozzles or tools are not dropped into the center of the screen belt.

Remove clogged or worn nozzles. Clean clogged nozzles with a piece of stiff wire and compressed air. Replace worn nozzles. When installing nozzles, use pipe tape to seal the nozzle threads. Offset the position of nozzles by approximately five degrees to prevent overlapping spray patterns of adjoining nozzles from impacting each other.

If possible, remove the spray header pipe cap/plug and flush the spray header. Reinstall the spray header cap /plug.

Turn on the water supply. Check spray pattern. Make final adjustments to the nozzles and/or spray header.

Turn on power to the screen motor. Run the screen belt to position the opening in the screen belt at the access panel openings.

Again, lock out power to the screen and brush motors.

Reassemble the removed screen panels, making sure that the spacers and side plates are properly installed, and that LocTite 271 heavy-duty thread locker is used on the threads of the screen panel screws.

Turn on power to the screen motor and jog the screen motor to check for smooth travel of the screen belt.

Setting Screen Drive Current Monitor

CAUTION

THE CURRENT MONITOR MUST BE SET PROPERLY TO ENSURE PROTECTION OF THE SCREEN. FAILURE TO SET THE MONITOR PROPERLY COULD DAMAGE THE EQUIPMENT.

The current monitor detects the current draw on one of the three screen motor leads, and disables the screen motor when an excessive current draw is detected for a pre-set amount of time. The current monitor offers optimum protection of the equipment when the current draw setting is just above the current draw of the motor during normal operation, and time settings are at a minimum yet sufficient to avoid nuisance tripping.

The standard current monitor includes the following operating parameters to optimize protection of the drive motor. Refer to the manufacturer's instructions in Section Nine of this Manual for additional details on this device.

Start Up Sensing Delay Time (seconds) – this setting provides an initial delay of a fault reading upon starting of the drive, to eliminate nuisance tripping of the motor upon startup. This feature is not adjustable on the monitor, but the monitor can be provided with an optional set point if needed to better suit the application. The monitor is typically provided with a 2 second Start Up Sensing Delay time.

Trip Delay Time (seconds) – this setting provides a delay of a fault signal during operation of the drive, to eliminate nuisance tripping of the motor during operation. Note that increasing this setting exposes the equipment to a current overload condition for a greater period of time, which may increase the chance of equipment damage. Typical setting is 1 second. It is advisable to keep this setting as low as possible.

Trip Point (% of amp range on the monitor) – this setting provides the current draw trip point for the monitor.

⚠ DANGER ⚠

ADJUSTMENT OF THE CURRENT MONITOR IS ACCOMPLISHED WITH ELECTRICAL POWER SUPPLIED TO THE CONTROL PANEL AND WITH THE UNIT IN OPERATION. THEREFORE, EXTREME CARE MUST BE TAKEN WHEN MAKING THESE ADJUSTMENTS, AS THE POSSIBILITY OF ELECTRICAL SHOCK DOES EXIST. ADJUSTMENTS SHOULD BE MADE ONLY BY AUTHORIZED AND QUALIFED PERSONNEL.

To properly adjust the monitor for a given load, set the Trip Delay Time and the Trip Point adjustment dials to a maximum. Next, apply power to the monitor and the respective motor. Then, slowly decrease the Trip Point adjustment until the monitor LED illuminates. This is the normal operating load point. Slightly increase the Trip Point setting to establish the trip point just above normal operating load. Lastly, decrease the Trip Delay Time – a 1 second delay is a good starting point, but this should be adjusted to minimize the response time for shutting down the unit without causing nuisance tripping.

Run the motor for a short duration after each setting change and make further adjustments if necessary.

It is recommended that the settings of the current monitor be recorded for troubleshooting purposes.

Inspecting / Testing Current Monitor

⚠ DANGER ⚠

TESTING OF THE CURRENT MONITOR IS ACCOMPLISHED WITH ELECTRICAL POWER SUPPLIED TO THE CONTROL PANEL AND WITH THE UNIT IN OPERATION. THEREFORE, EXTREME CARE MUST BE TAKEN WHEN MAKING THESE ADJUSTMENTS, AS THE POSSIBILITY OF ELECTRICAL SHOCK DOES EXIST. ADJUSTMENTS SHOULD BE MADE ONLY BY AUTHORIZED AND QUALIFED PERSONNEL.

Check each wire connection on the monitor. Tighten loose connections.

Note the present settings on both monitor adjustments (Trip Point and Trip Delay Time).

Increase the Trip Delay to its maximum setting.

Slowly decrease the Trip Point setting until the monitor LED illuminates. Then, slightly increase the Trip Point adjustment.

Adjust the Trip Delay Time to its original setting.

It is recommended that the settings of the current monitor be recorded for troubleshooting purposes. If a substantial change in the settings is noted, the monitor may need to be replaced, or the screen needs to be inspected for possible problems.

Inspecting Wobble Switch

An optional Wobble Switch may be provided to detect the presence of potentially damaging large objects on the screen belt and shut down the screen. See Equipment Drawings in this Manual to determine if this option has been provided.

For this procedure, it will be necessary for a second person to monitor the closing of the switch contacts at the control panel.

Lock out power to the screen motor. If it is necessary to have power to the switch to readily monitor the closing of the wobble switch contacts, then run the screen for several cycles (to minimize solids on the screen panels) and make provisions to ensure that the screen belt does not run while the inspection is being performed.

Remove the cover (or open the hinged access door, if provided) located above the wobble switches (see Fig 6K).

Insert a hook long enough to catch the wobble stick on each switch. Lift the wobble stick to trip the switch.

⚠ DANGER ⚠

DO NOT PLACE LIMBS OR ANY HAND HELD OBJECT IN CLOSE PROXIMITY TO A MOVING SCREEN BELT!

Repair or replace defective wobble switches.

Adjusting Wobble Switch Position

Lock out power to the screen motor.

Remove the wobble switch enclosure bolts and slide the enclosure away from the cover (see Fig 6K). It may be necessary to disconnect the conduit feeding the switch enclosure to gain sufficient access to the switch body.

Loosen the switch-mounting screws and adjust the switch as required.

Tighten the switch-mounting holes.

Secure the switch enclosure to the cover.

Repeat the adjustment for each switch on the screen to ensure that all switches are equally adjusted.

Pivoting the Screen Out of the Channel

Optional pivoting supports may be provided to allow the screen to be pivoted out of the channel for maintenance purposes. See Equipment Drawings in this Manual to determine if this option has been provided.

Lock out power to the screen motor.

Remove all obstructions in the travel path of the screen, upstream and downstream of the screen.

If flexible utility connections have not been provided, disconnect the wiring from all electrical devices mounted on the screen, and disconnect the spray system water supply piping. It is not necessary to disconnect devices that will remain stationary while the screen is pivoted out of the channel.

Close upstream and downstream slide gates to isolate the screen. Drain water from channel. Remove debris that has accumulated in front of the screen.

If the screen will be left in a maintenance position for an extended period, remove the air vents (breather plugs) in the screen and brush drive gear reducers, and replace with solid plugs. Air vents (breather plugs) must be reinstalled after the screen is returned to its installed position.

If possible, remove the outer front seals and outer corner seals. These seals contact the channel walls and may cause the screen frame to twist as the screen is being pulled out of the channel.

Confirm that the lifting device is of sufficient strength to pull the screen out of the channel, and is positioned relative to the screen as indicated on the Equipment Drawings.

Use a spreader bar across the width of the screen and secure cables to the lower lifting lugs on the screen frame.

Unfasten the pivot locking brackets from the screen frame. The pivot locking brackets can remain fastened to the pivot support legs.

NOTE: **On a screen designed for a 'shallow' channel, the unit's center of gravity may be on the downstream side of the pivot point. With this arrangement, the unit has a tendency to pivot out of the channel on its own.**

When a screen with this arrangement is pivoted out of the channel, the solids discharge end of the screen must be supported before the pivot locking brackets are removed.

CAUTION

THE SCREEN MUST BE LIFTED OUT OF THE CHANNEL WITHOUT TWISTING THE SCREEN FRAME. PROCEED SLOWLY AND USE EXTREME CAUTION WHEN LIFTING THE SCREEN. ADJUST LIFTING CABLES TO ENSURE THAT EQUAL TENSION IS BEING APPLIED TO EACH LOWER LIFTING LUG.

When the screen is out of the channel, place jacks or a similar supporting structure under the screen. If possible, keep tension on the lifting cables as a precaution.

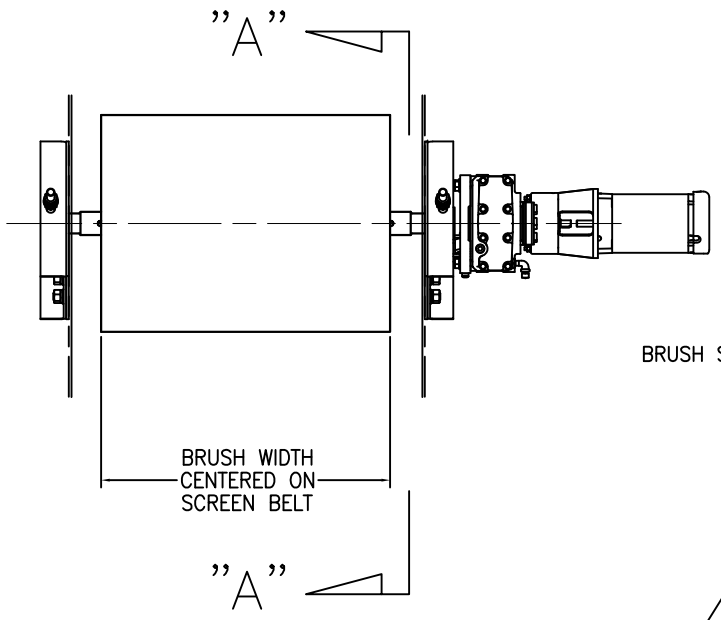
When lowering the screen back into the channel, confirm that all debris has been removed from the channel. Screen must rest evenly on the bottom of the channel, with no gaps between the screen frame and channel floor.

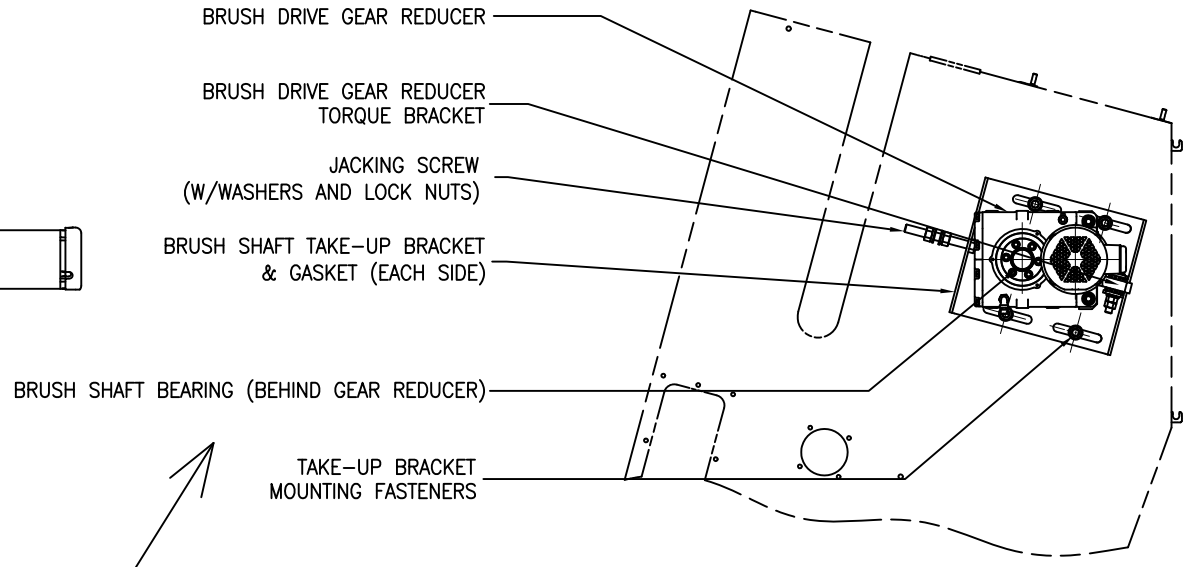
Fasten the pivot locking brackets to the screen frame.

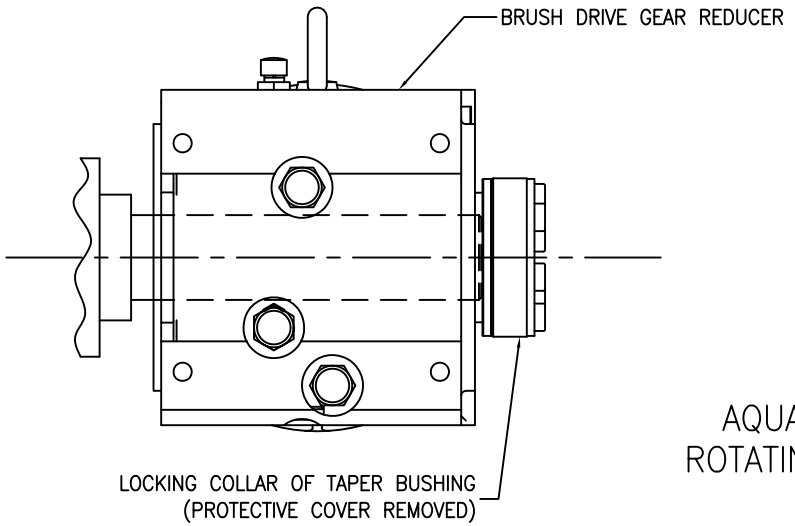
If the outer front seals and outer corner seals were removed, reinstall these seals. Confirm that these seals are in good condition and making good contact with the channel walls.

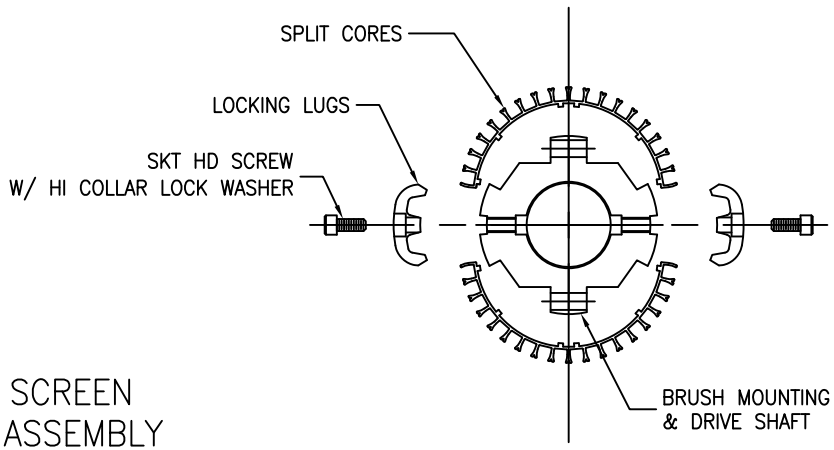
Reconnect wiring on all electrical devices on the screen. Reconnect water spray supply piping.

Turn on power to the screen and brush motors and run the screen belt and brush to confirm smooth operation of the screen belt.





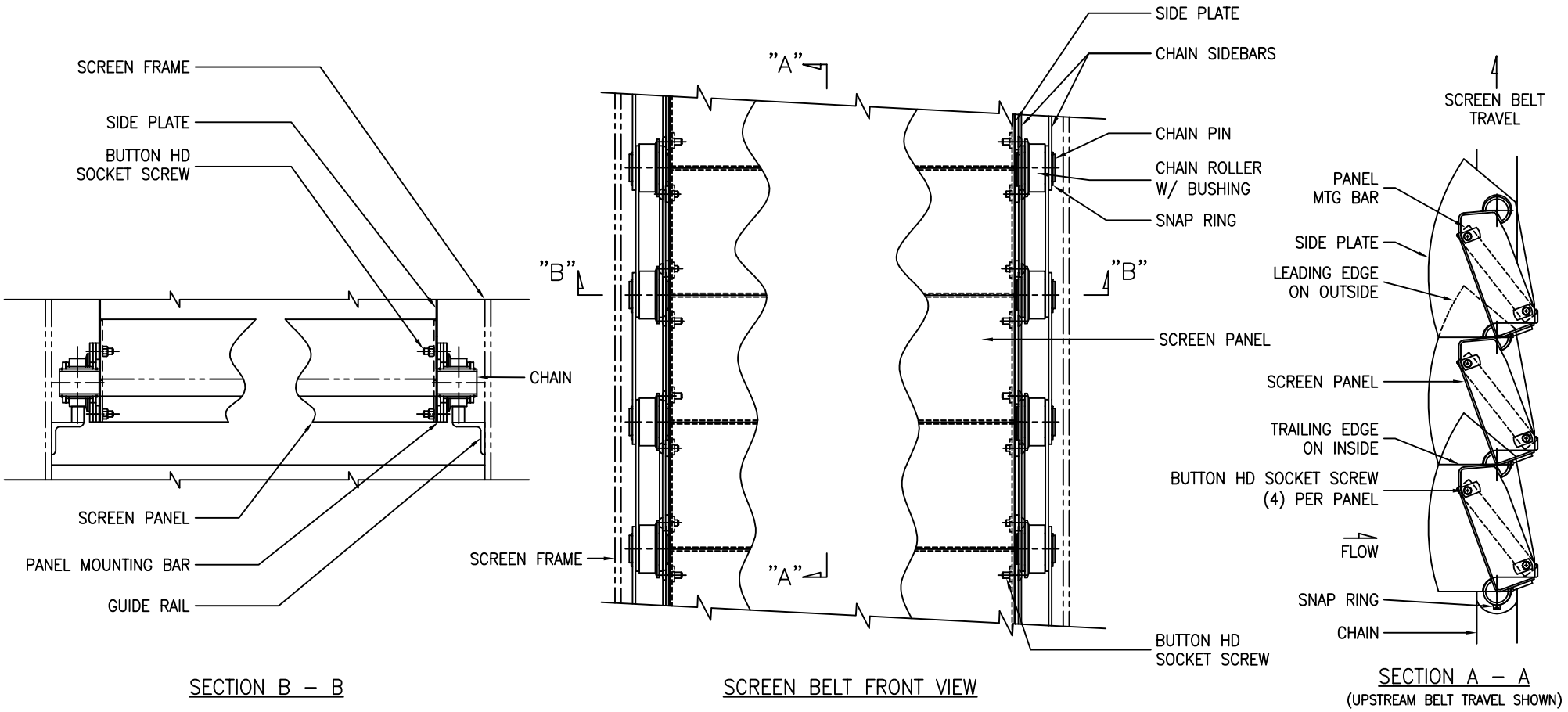




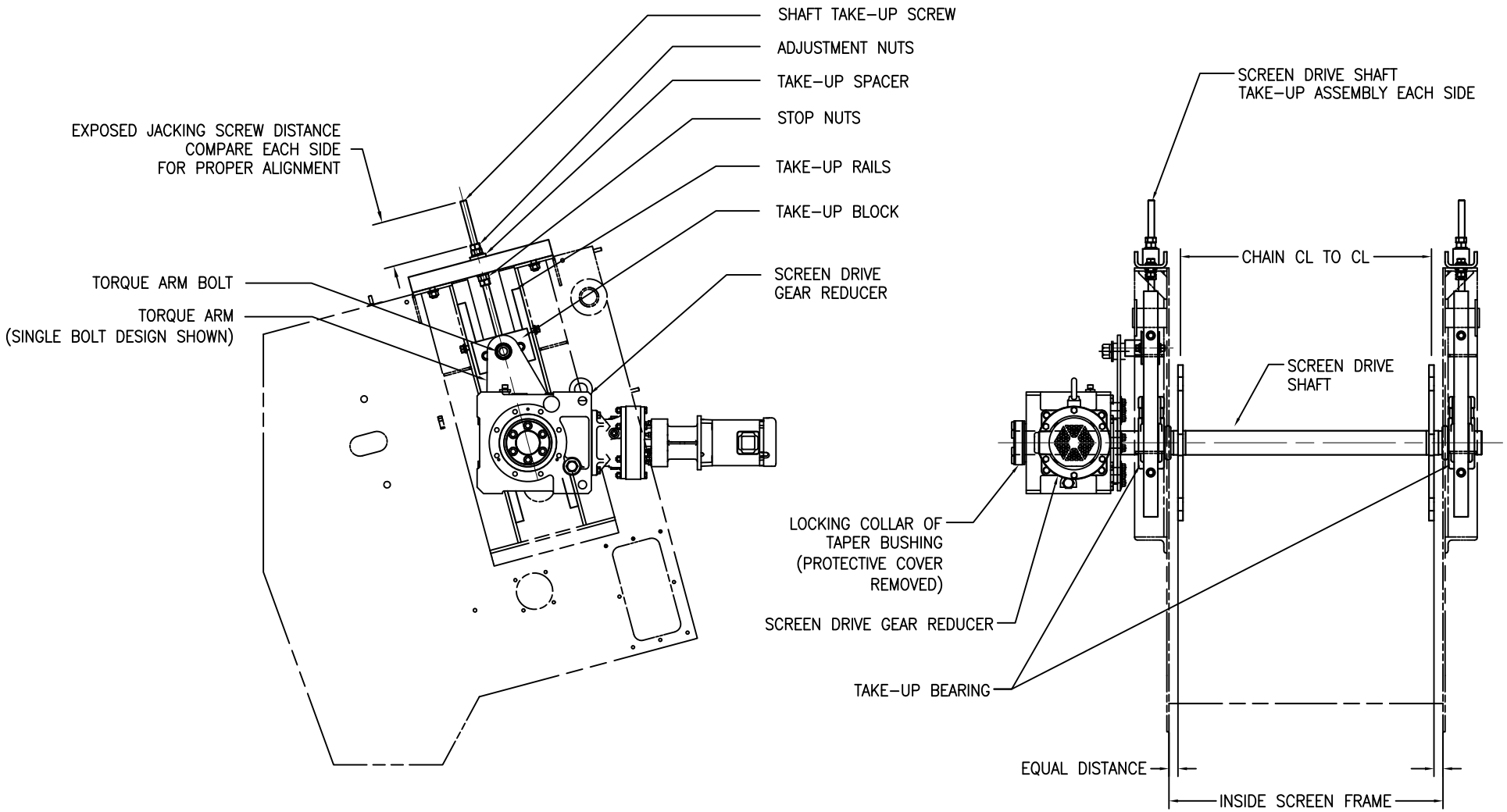
VIEW "A-A"

BRUSH BRISTLES NOT SHOWN

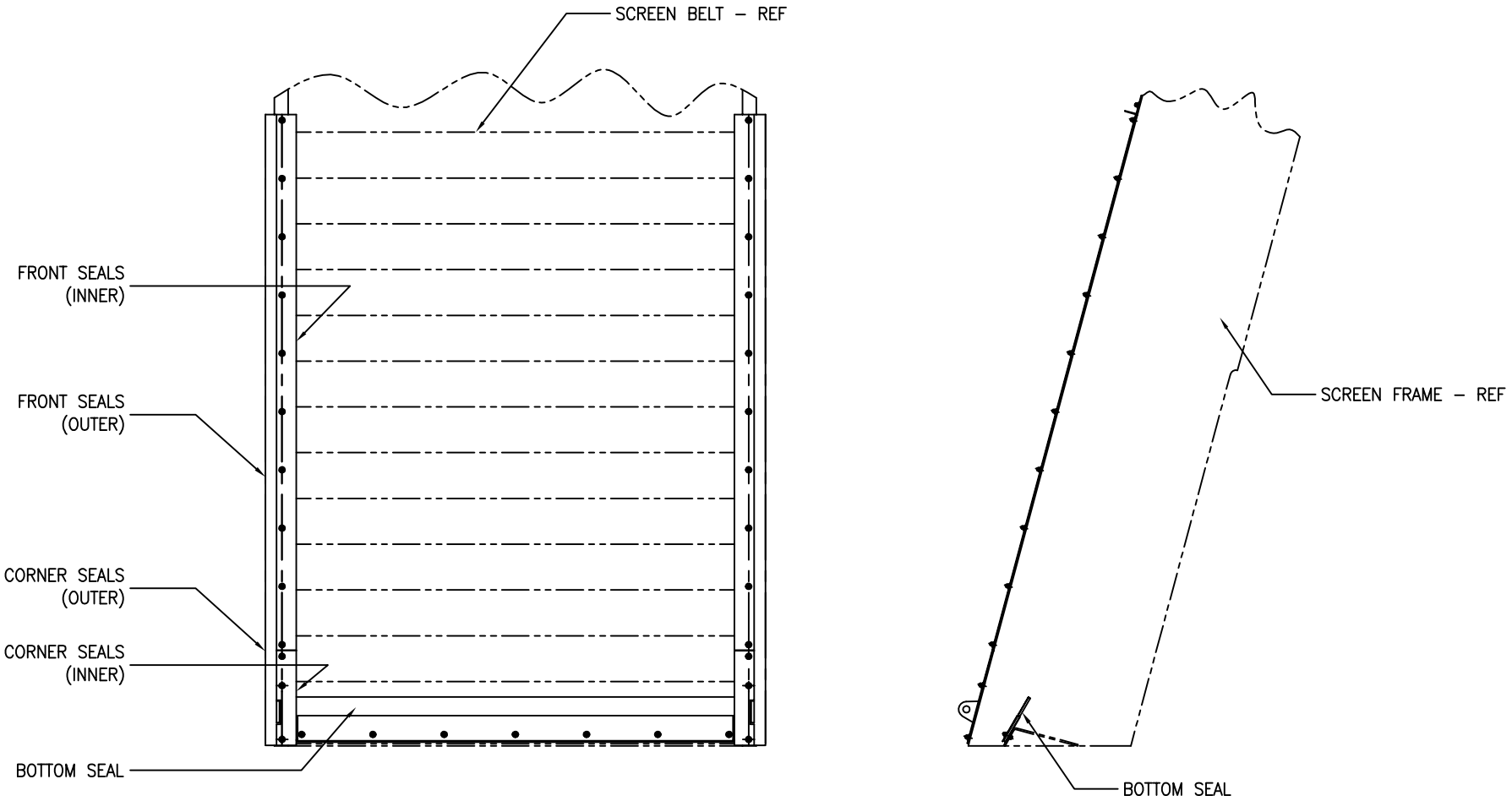
AQUAGUARD PF SCREEN
ROTATING BRUSH ASSEMBLY
FIG 6A



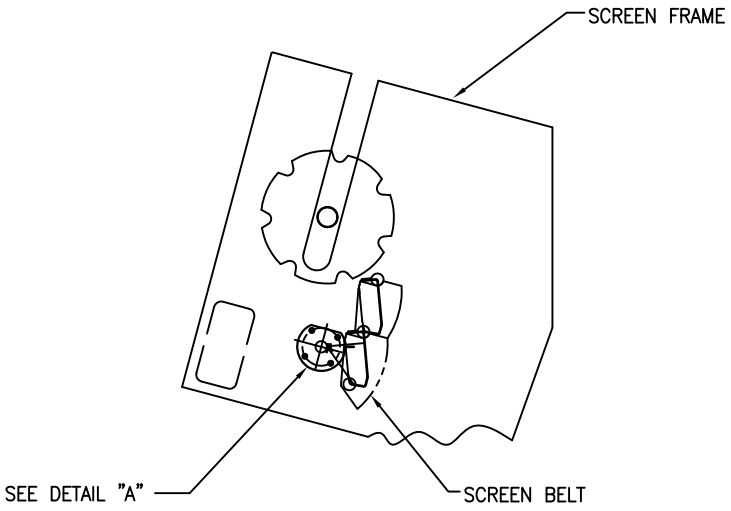
AQUAGUARD PF SCREEN
SCREEN BELT CONSTRUCTION
FIG 6D

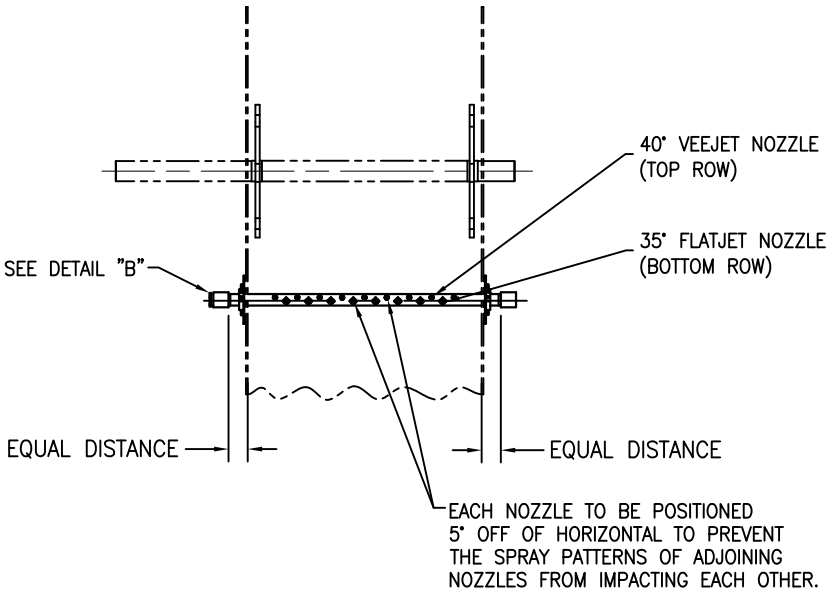


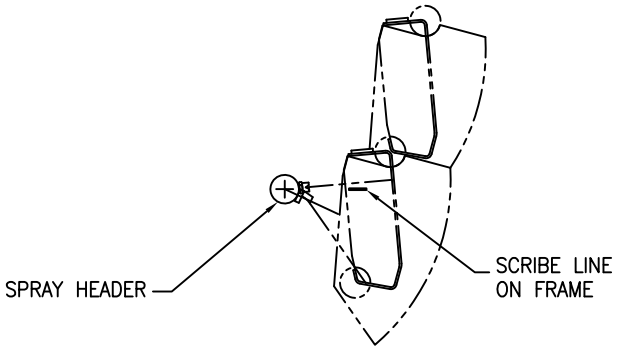
AQUAGUARD PF SCREEN
SCREEN DRIVE ASSEMBLY
(SINGLE BOLT TORQUE ARM DESIGN SHOWN)
FIG 6E



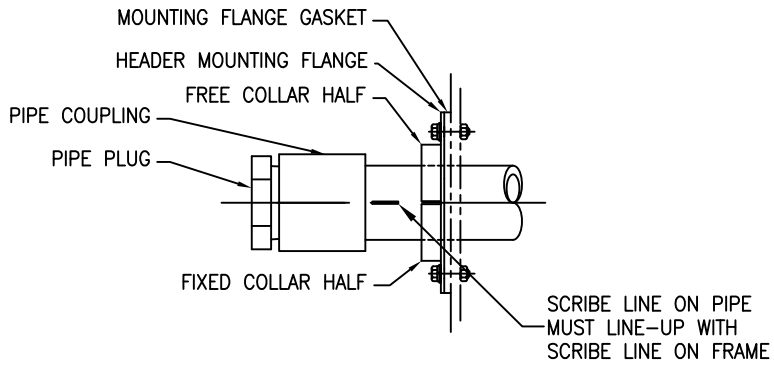
AQUAGUARD PF SCREEN
FRONT SEAL ASSEMBLY
FIG 6G





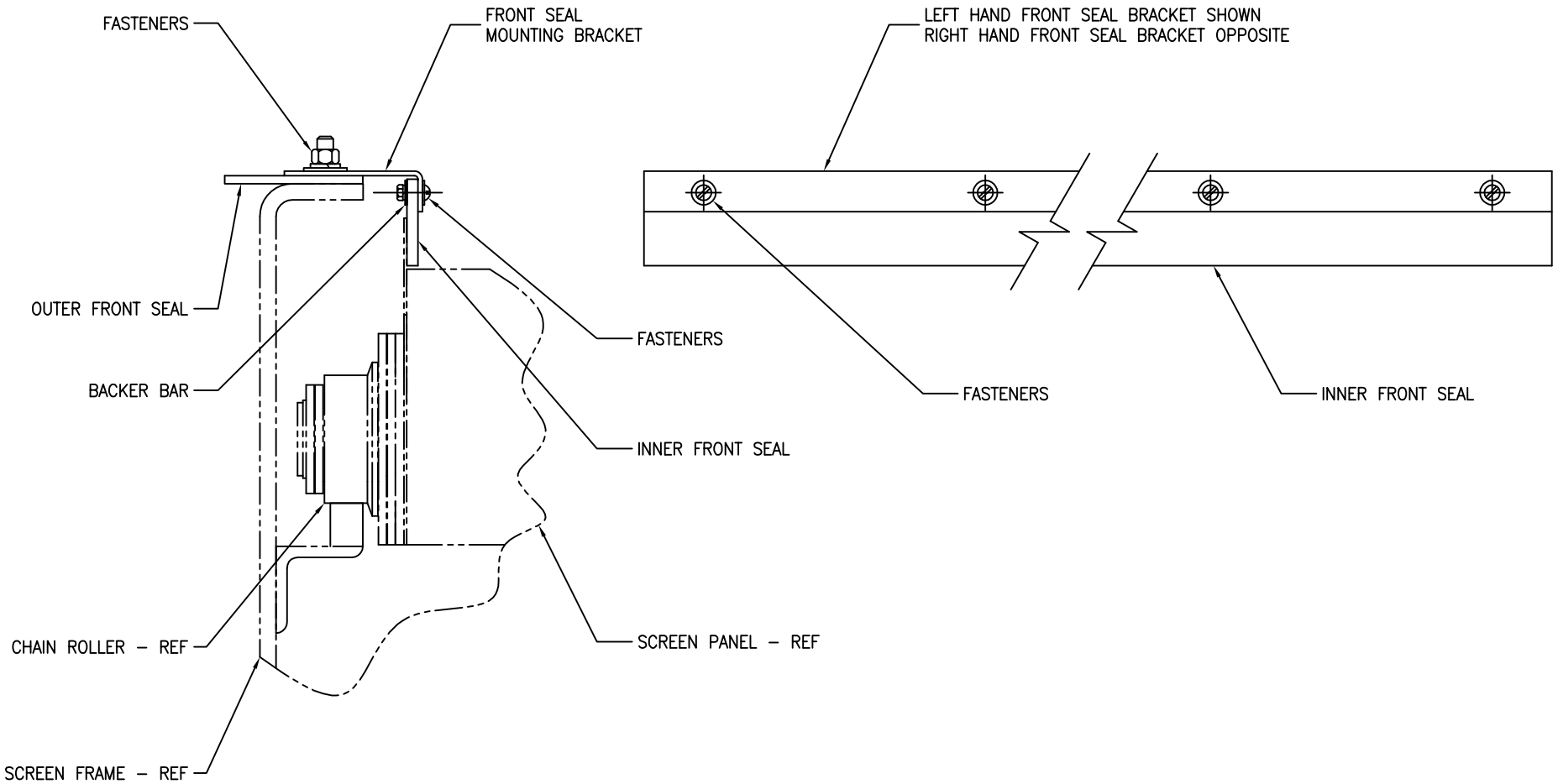


DETAIL A

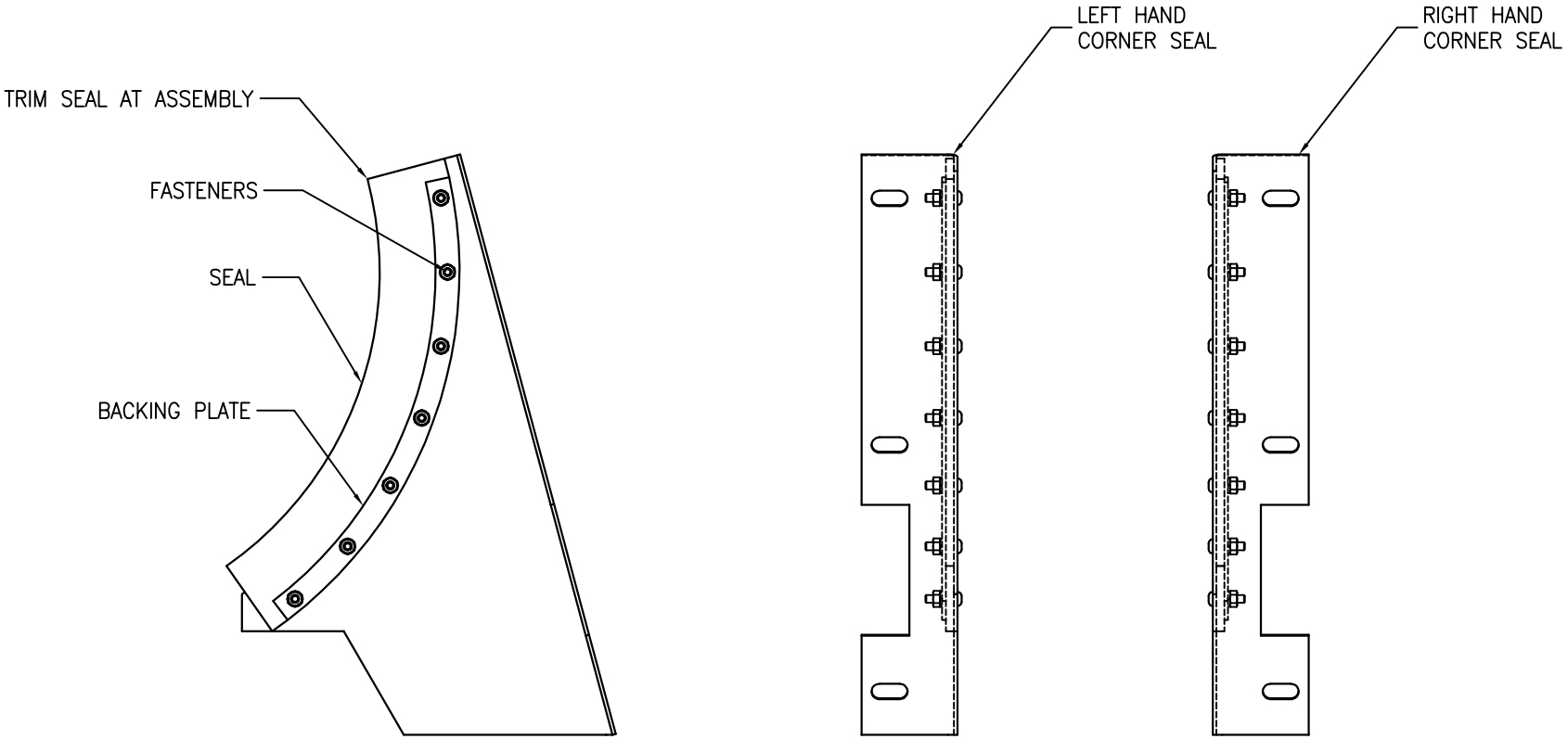


DETAIL B

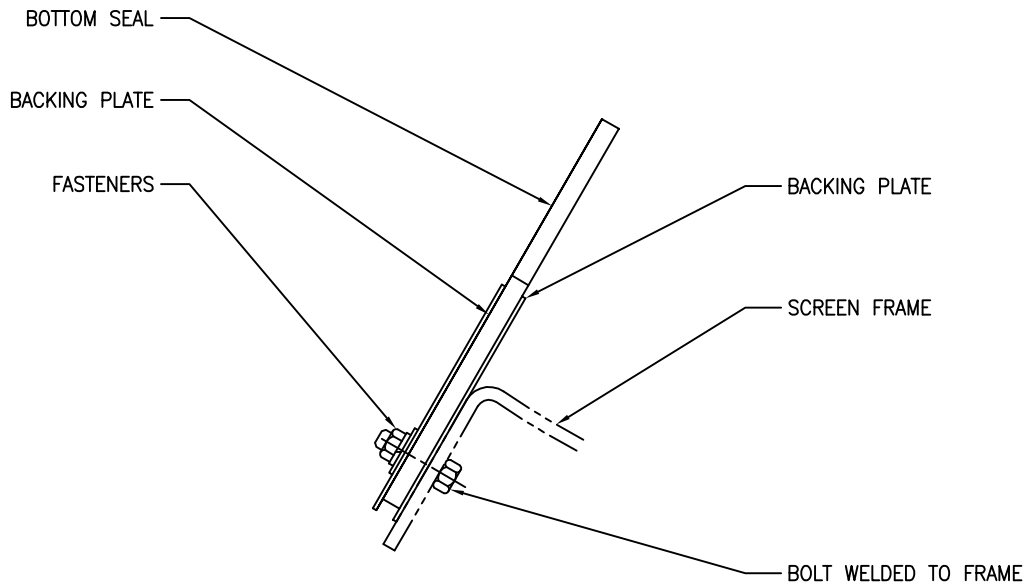
AQUAGUARD PF SCREEN
SCREEN SPRAY SYSTEM
FIG 6H



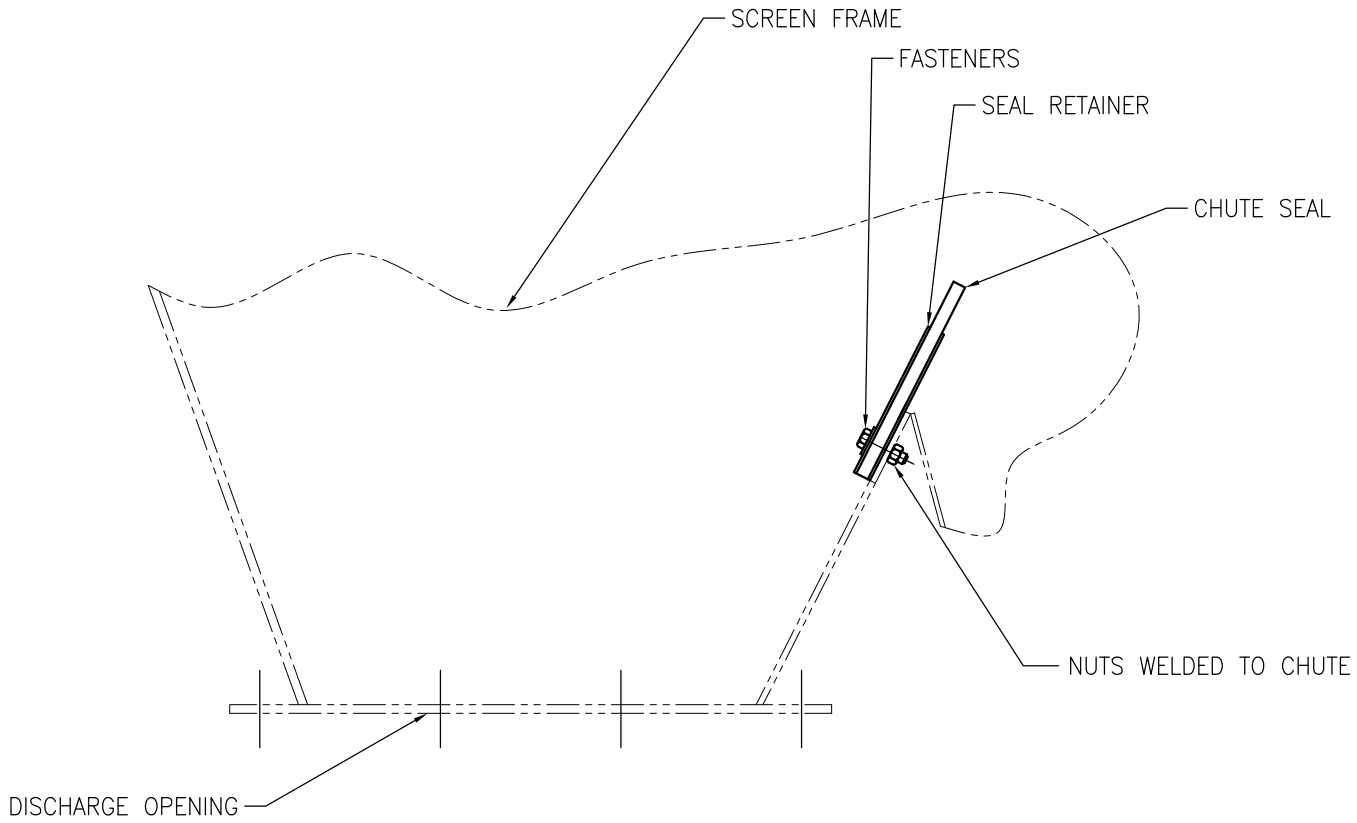
AQUAGUARD PF SCREEN
FRONT SEAL ASSEMBLY
FIG 6L



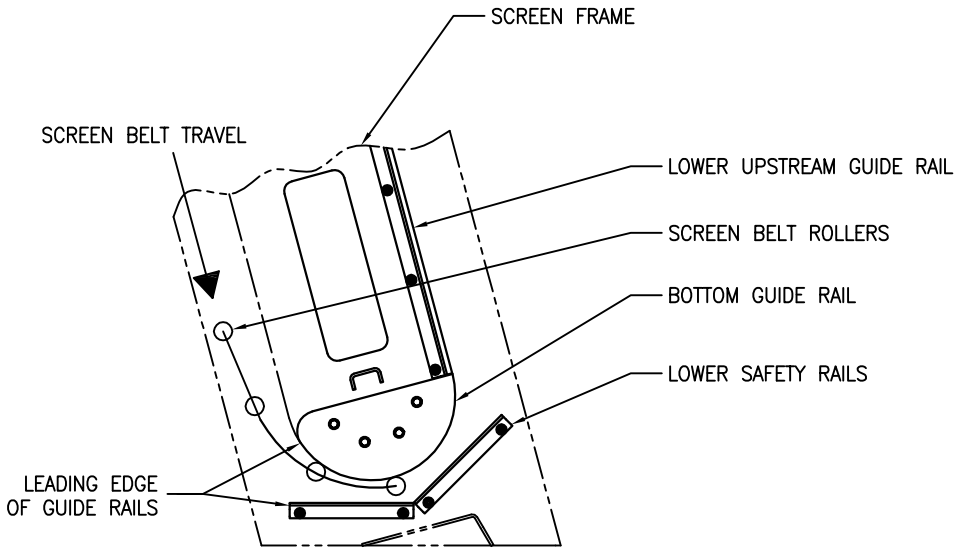
AQUAGUARD PF SCREEN
CORNER SEAL ASSEMBLY
FIG 6M



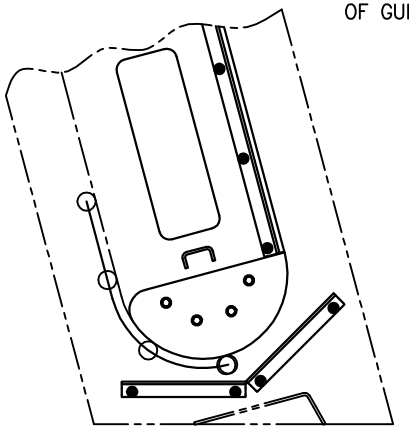
AQUAGUARD PF SCREEN
BOTTOM SEAL ASSEMBLY
FIG 6N



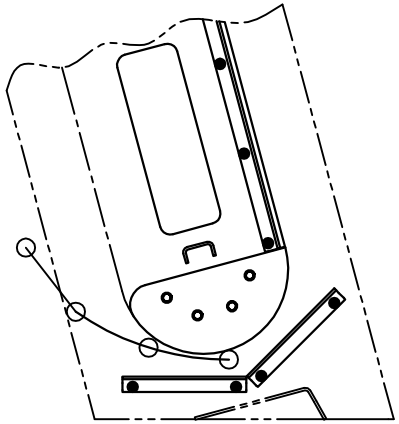
AQUAGUARD PF SCREEN
CHUTE SEAL DETAIL
FIG 6P



PROPER SCREEN BELT TENSION



SCREEN BELT TENSION
IS TOO TIGHT!



SCREEN BELT TENSION
IS TOO LOOSE!

AQUAGUARD PF SCREEN
BOTTOM GUIDE RAIL DETAIL
FIG 6R

SECTION SEVEN

Aqua Guard PF™ Filter Screen
SCREEN TROUBLESHOOTING GUIDE

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND ARE FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Screen belt does not start.	No power at the motor or at the control panel.	Confirm that power is available. Turn disconnect switch and screen selector switch to ON position. Restart screen.
	Screen selector switch not in AUTO mode.	Turn selector switch to HAND mode to confirm that motor is functioning. Turn selector switch to AUTO mode. Confirm that all remote permissive contacts are made. Restart screen.
	Control devices used to initiate screen are malfunctioning.	Check functioning of level measuring device. Repair or replace devices as required. Restart screen.
		Check time clock and associated timer settings. Adjust if necessary.

SCREEN TROUBLESHOOTING GUIDE
(Cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Screen belt does not start. (cont'd)	Control devices used to initiate screen are malfunctioning. (cont'd)	Check functioning of thermostat switch. Repair or replace device as required. Restart screen.
	Screen motor overloaded (blown fuses, tripped overloads, tripped current monitor, tripped thermostats or auto thermals).	Check for screen belt jamming. Remove obstruction, check for screen belt damage, reset controls, and restart screen.
		Check for screen belt binding and damage. Adjust or repair screen belt, reset controls, and restart screen.
		Motor malfunctioning. Repair or replace, reset controls, and restart screen.
		Gear reducer malfunctioning. Repair or replace, reset controls, and restart screen.
		Screen drive shaft bearings have failed. Replace bearings, reset controls, and restart screen.
	Screen Protection switches are tripped (wobble switch, e-stop, zero speed).	Check for obstructions or screen malfunctions. Reset e-stop and restart after confirming that screen is ready to run.
Brush does not start.	No power at the motor or at the control panel.	Confirm that power is available. Turn disconnect switch and brush selector switch to ON position. Restart brush.
	Brush selector switch not in AUTO mode.	Turn selector switch to HAND mode to confirm functioning of motor. Turn selector switch to AUTO mode. Confirm that all permissive contacts are made. Restart brush.

SCREEN TROUBLESHOOTING GUIDE
(Cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Brush does not start. (cont'd)	Brush motor overloaded (blown fuses, tripped overloads, tripped thermostats or auto thermals).	Check for brush jamming. Remove obstruction, check for brush damage, reset controls, and restart screen and brush.
		Motor malfunctioning. Repair or replace, reset controls, and restart screen and brush.
		Gear reducer malfunctioning. Repair or replace, reset controls, and restart screen and brush.
		Brush drive shaft bearings have failed. Replace bearings, reset controls, and restart screen and brush.
Overloading of screen drive	Obstruction jamming screen belt.	Remove obstruction, check screen belt for damage, reset controls, and restart screen.
	Screen belt binding (not running smoothly).	Check screen belt for damage, adjust screen belt tension, reset controls, and restart screen.
	Motor malfunctioning.	Diagnose motor malfunctioning. Repair or replace. Restart screen.
	Gear reducer malfunctioning.	Diagnose reducer malfunctioning. Repair or replace. Restart screen.
	Screen drive shaft bearing failing.	Replace bearings. Restart screen.

SCREEN TROUBLESHOOTING GUIDE
(Cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Overloading of brush drive	Obstruction jamming brush.	Remove obstruction, check brush for damage, reset controls, and restart screen and brush.
	Brush bristles binding in perforations of screen panels.	Replace brush if damaged. Confirm that brush design (bristle type and diameter, brush OD) is correct. Confirm proper adjustment of brush. Confirm that brush runs whenever the screen belt runs.
	Motor malfunctioning.	Diagnose motor malfunctioning. Repair or replace. Restart screen and brush.
	Gear reducer malfunctioning.	Diagnose reducer malfunctioning. Repair or replace. Restart screen and brush.
	Brush drive shaft bearing failing.	Replace bearings. Restart screen and brush.
Solids larger than screen opening bypassing screen.	Side channel seals not contacting channel walls, allowing bypass around the sides of the screen frame.	Replace seals. Confirm full contact with channel walls before restarting.
	Front seals or bottom seal are damaged or worn, allowing bypass around screen panels or underneath the screen belt.	Replace seals. Confirm full contact with screen belt before restarting.
	Screen panels are damaged.	Replace screen panel and check condition of drive chains. Replace chain links, if necessary.
	Side plates are damaged.	Replace side plates.

SCREEN TROUBLESHOOTING GUIDE
(Cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Excess headloss across the screen.	Screen initiation settings not set properly.	Adjust time clock and timer settings to allow the screen to run more often (frequency), and for a longer period of time (duration).
		Adjust actuation point of level measuring devices.
	Screen speed is too slow.	Increase screen belt speed through VFD.
	Screen not being cleaned properly.	Check operating condition of spray systems. Confirm correct position of spray pattern. Unclog or replace nozzles. Confirm adequate supply pressure and flow rate.
		Check operating condition of brush. Adjust position of brush, or replace brush core. Adjust brush speed, if VFD supplied on brush drive.
	Screen openings clogged.	Clean screen with pressure washer. Confirm cause of screen clogging.
	Flow conditions have changed.	Confirm actual flow conditions and compare to design conditions. Remove excess flow or solids loading conditions.

SCREEN TROUBLESHOOTING GUIDE
(Cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Reduced screenings volume being discharged out of screen.	Screenings accumulation in discharge chute / hopper.	Wash down discharge chute or hopper.
	Collection device backing up screenings.	Empty receptacle or repair solids handling equipment, clear backlog of screenings.
	Solids larger than the screen opening bypassing the screen.	See Possible Causes and Corrective Actions above.

⚠ DANGER ⚠

IN THE EVENT OF A SCREEN JAM, LOCK-OUT AND TAG-OUT THE SCREEN AND BRUSH DRIVES, DETERMINE THE CAUSE OF THE JAM AND REMOVE THE OBSTRUCTION BEFORE ATTEMPTING TO RE-START THE SCREEN. THE FAN ON THE SCREEN DRIVE MOTOR MAY BE TURNED BY HAND IN FORWARD OR REVERSE TO RELIEVE THE TENSION ON THE SCREEN BELT, WHICH MAY HELP TO DISLODGE THE OBSTRUCTION.

SCREEN CONTROLS PROVIDED BY PARKSON CORPORATION ARE NOT SUPPLIED WITH THE PROVISION FOR REVERSING THE SCREEN. IF CUSTOMER-SUPPLIED CONTROLS HAVE THE PROVISION FOR REVERSING THE SCREEN (E.G. THROUGH A REVERSING STARTER OR A VFD), THEN THE SCREEN MUST ONLY BE JOGGED IN REVERSE, AND EXTREME CAUTION MUST BE EXERCISED WHEN DOING SO TO PREVENT DAMAGE TO THE SCREEN OR INJURY TO PERSONNEL. THE SCREEN MUST NOT BE ALLOWED TO RUN CONTINUOUSLY IN REVERSE.

Aqua Guard PF™ Filter Screen
MOTOR TROUBLESHOOTING GUIDE

Since any number of reasons could be responsible for a motor failure, the following chart lists usual conditions that can lead to difficulties with a motor. Should there be any indication of a premature failure, care must be taken to make certain that:

1. The original motor selection was the proper one.
2. The motor was installed correctly, particularly the electrical connections.
3. The power supply was correct.
4. The motor was of the proper size (speed and horsepower) to do the job.

Assuming all of the above conditions have been completed, use of the following chart in pinpointing the difficulty will lead to long service life and complete satisfaction.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor fails to start	Blown fuses	Replace fuses at least 125% nameplate amperes.
	Overload trips	Check and reset overload in starter.
	Improper current supply	Check to see that power supplied agrees with motor nameplate and load factor.
	Improper line connections	Check connections with diagram supplied with motor.
	Open circuit in winding or starting switch	Indicated by humming sound when switch is closed. Check for loose wiring connections; also see if starting switch inside motor is closed.
	Mechanical failure	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator	Indicated by blown fuses. Motor must be rewound.
	Poor stator coil connection	Remove end bells, locate with test lamp.
	Rotor defective	Look for broken bars or end rings.
	Motor may be overloaded	Reduce load
	If three phase, one phase may be open	Check lines for open phase.
	Defective capacitor	Check for short circuit, grounded or open capacitor, or connection, replace if necessary.
Motor stalls	Wrong application	Change type or size. Consult manufacturer.
	Overloaded motor	Reduce load.
	Low motor voltage	See that nameplate voltage is maintained. Check connection.
	Open circuit	Fuses blown, check overload relay, stator and pushbuttons
Motor runs and then dies down	Power failure	Check for loose connections to line, to fuses and to control.
Motor does not come up to speed	Not applied properly	Consult supplier for proper type.
	Voltage too low at motor terminals because of line drop	Use higher voltage on transformer terminals or reduce load. Check connections.
	Starting load too high	Check load motor is supposed to carry at start.
	Broken rotor bars or loose rotor	Look for cracks near the rings. A new rotor may be required as repairs are usually temporary.
	Open primary circuit	Locate fault with testing device and repair.

Aqua Guard PF™ Filter Screen
MOTOR TROUBLESHOOTING GUIDE
(Cont'd)

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Motor takes too long to accelerate	Excess loading	Reduce load.
	Poor circuit	Check for high resistance.
	Defective squirrel cage rotor	Replace with new rotor.
	Applied voltage too low	Get power company to increase power tap.
Wrong rotation	Wrong sequence of phases	Reverse connections at motor or at switchboard.
Motor overheats while running under load	Overload	Reduce load
	Frame or bracket vents may be clogged with dirt and prevent proper ventilation of motor	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open	Check to make sure that all leads are well connected.
	Grounded coil	Locate and repair.
	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
	Shorted stator coil	Repair and then check watt meter reading.
	Faulty connection	Indicated by high resistance.
	High voltage exceeds +10% of nameplate volts	Check terminals of motor with a voltmeter.
	Low voltage exceeds -10% of nameplate volts	Check terminals of motor with a voltmeter.
	Rotor rubs stator bore	If not poor machining on brackets, replace worn bearings.
Motor vibrates after corrections have been made	Motor misaligned	Realign.
	Weak support	Strengthen base.
	Coupling out of balance	Balance coupling.
	Driven equipment unbalanced	Rebalance driven equipment.
	Defective ball bearing	Replace bearing.
	Bearings not in line	Line up properly.
	Balancing weights shifted	Rebalance rotor.
	Polyphase motor running single phase	Check for open circuit.
	Excessive end play	Adjust bearing or add washer.
Unbalanced line current on polyphase motors during normal operation	Unequal terminal volts	Check leads and connections.
	Single phase operation	Check for open contacts.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Scraping noise	Fan rubbing air shield	Remove interference.
	Fan striking insulation	Clear fan.
	Loose on bedplate	Tighten holding bolts.
	Air gap not uniform	Check and correct bracket fits or bearing.
	Rotor unbalance	Rebalance.
Hot bearings general	Bent or sprung shaft	Straighten or replace shaft.
	Excessive belt pull	Decrease belt tension.
	Pulleys too far away	Move pulley closer to motor bearing.
	Pulley diameter too small	Use larger pulleys.
	Misalignment	Correct by alignment of drive.
Hot bearings sleeve	Oil window in bearing obstructed by dirt	Remove bracket with bearing and clean bearing housing & oil window groves: renew oil.
	Oil too heavy	Use recommended lighter oil.
	Oil too light	Use recommended heavier oil.
	Too much end thrust	Reduce thrust induced by drive, or supply external means to carry thrust.
	Badly worn bearing	Replace bearing.
Hot bearings ball	Insufficient grease	Maintain proper quantity of grease in bearing.
	Deterioration of grease or lubricant contaminated	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant	Reducer quantity of grease, bearing should not be more than 1/2 filled.
	Overloaded bearing	Check alignment, side & end thrust.
	Broken ball or rough races	Replace bearing, fist clean housing thoroughly.

SECTION EIGHT

Aqua Guard PF™ Filter Screen
REPLACEMENT PARTS

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND ARE FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

Replacement parts can be ordered either through your Parkson Corporation Representative or by contacting the Parkson Corporation Parts and Service Department toll free at **1-888-PARKSON**.

REPLACEMENT PARTS LIST

The parts listed below are typical replacement parts for the Aqua Guard PF™ Filter Screen. Parts that are normally considered to be required for a major screen overhaul are not listed. Please contact Parkson Corporation Parts and Service Department for assistance with parts selection for a major screen overhaul.

NOTE: **Please give the project number (P02010802), serial number (P0201080207) when ordering replacement parts. This will ensure accurate part identification.**

Item	Qty per Unit	Description	Unit Price	Part Number	Total Qty Provided as Spares
1	1	Brush, Rotating (Core)		3815-049-25/D *	
2	3	Brush Mounting Flange Assembly		3333-017/M *	
3	46	Screen Panel		1020885-09 *	
4	92	Side Plate		1107-452/4 *	
5	184	Snap Ring		0000031	
6	184	Button Hd Screw, 3/8”-16 UNC x 1-1/4” lg, Screen Panel		3536-001/18*	
7	92	Cap, Chain		3041-028/M	
8	10	Nozzle, VeeJet, 40° Spray, 1 GPM (Screen Spray Header – Top Row)		3035-184/3	
9	9	Nozzle, FlatJet, 35° Spray, 1 GPM (Screen Spray Header–Bottom Row)		3035-172/3	
10	2	Guide Rail, Lower Upstream		2953-023/4	
11	2	Guide Rail, Bottom		2953-027/4	
12	2	Bearing, Screen Drive Shaft		3357-071-003/M	
13	2	Bearing, Brush Drive Shaft		0006079	
14	1	Gasket, Brush Take-Up Bracket, Drive End		1020662	
15	1	Gasket, Brush Take-Up Bracket, Opposite Drive End		1265-404/R	
16	1	Chute Seal		1020741-09	
17	2	Front Inner Seal		1020770-06	
18	2	Front Outer Seal		1020782-04	
19	2	Corner Seal		1702-043-001/R	
20	1	Bottom Seal		1020474-05	

* Recommended Shelf Spare

Item	Qty per Unit	Description	Unit Price	Part Number	Total Qty Provided as Spares
21	1	Gear Reducer, Screen Sumitomo 3C14DBY		3007-299/M	
22	1	Motor, 3/4 HP, Screen		3075-478-004/M	
23	1	Gear Reducer, Brush Sumitomo A6100		3007-312/M	
24	1	Motor, 1.5 HP, Brush		3075-480-024/D	
25	2	Gasket, 1-1/4” Header Pipe		1265-348-013/R	
26	4	Hold Down Clamp, Access Door		3379-006/4	
27	1	Gasket, Access Door		1020652-05	
28	1	Solenoid Valve, 1-1/4” NPT		3076-100/M	

SECTION NINE

Aqua Guard PF™ Filter Screen
COMPONENT DATA

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

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Equipment Bill of Materials

Single Level EBOM

Date 08-31-16 (12:45:26)

Project	**P02010802**	**Peachtree City, GA**
Engineering Item	**P0201080203**	**AG-PF-MN-A, W/CONTROLS**
Engineering Item Revision	**0**	**INITIAL RELEASE**
Revision Status	**Approved by Production**	
Drawing	**P0201080203-.DWG**	
BOM Quantity	**1**	**ea**

LARRY B TURNER WRF
AQUA GUARD SCREEN SYSTEM
W/ CONTROLS

REFERENCE AWP PROJECT #P0430083203

Item no.	Component Description	Item Rev.	Drawing	Size	Material	Item Type	Length [in]	Width [in]	No. of Units	Net Quantity	Unit
10	P0201080207 MAIN ASSY,AG-PF-MN-A-75-3'x10' STAMP THE FOLLOWING INFORMATON ON THE UNIT NAMEPLATE: PRODUCT: AG-PF SCREEN MODEL: AG-PF-MN-A-3'x10'x1/4" SERIAL: P0201080207 PROJECT: P02010802	A	P0201080207-.DWG		/A4	M				1.0000	ea
20	P0201080213 CONTROL PANEL #3	0	P0201080213-.DWG		304 SST	P				1.0000	ea
30	2952-002-030/4 SLIP CHUTE,AGPF MACHINE WIDTH: 3.0'	0	2952-002-000-.DWG		304	P				1.0000	ea
40	1265-437-030/R GASKET,DISCHARGE,AGPF MACHINE WIDTH: 3.0'	0	1265-437-000-.DWG		NEOPRENE	P				1.0000	ea
50	3020-005/18 SCR,HEX CAP,3/8-16X1 1/4 LG	0			18-8	P				18.0000	ea
60	3024-004/18 WASHER,FL,3/8	0			18-8	P				36.0000	ea
70	3025-004/18 WASHER,SPT LK,3/8	0			18-8	P				18.0000	ea
80	3026-005/18	0			18-8	P				18.0000	ea

Single Level EBOM

Project	**P02010802**	**Peachtree City, GA**
Engineering Item	**P0201080203**	**AG-PF-MN-A, W/CONTROLS**
Engineering Item Revision	**0**	**INITIAL RELEASE**
Revision Status	**Approved by Production**	
Drawing	**P0201080203-.DWG**	
BOM Quantity	**1**	**ea**

LARRY B TURNER WRF
AQUA GUARD SCREEN SYSTEM
W/ CONTROLS

REFERENCE AWP PROJECT #P0430083203

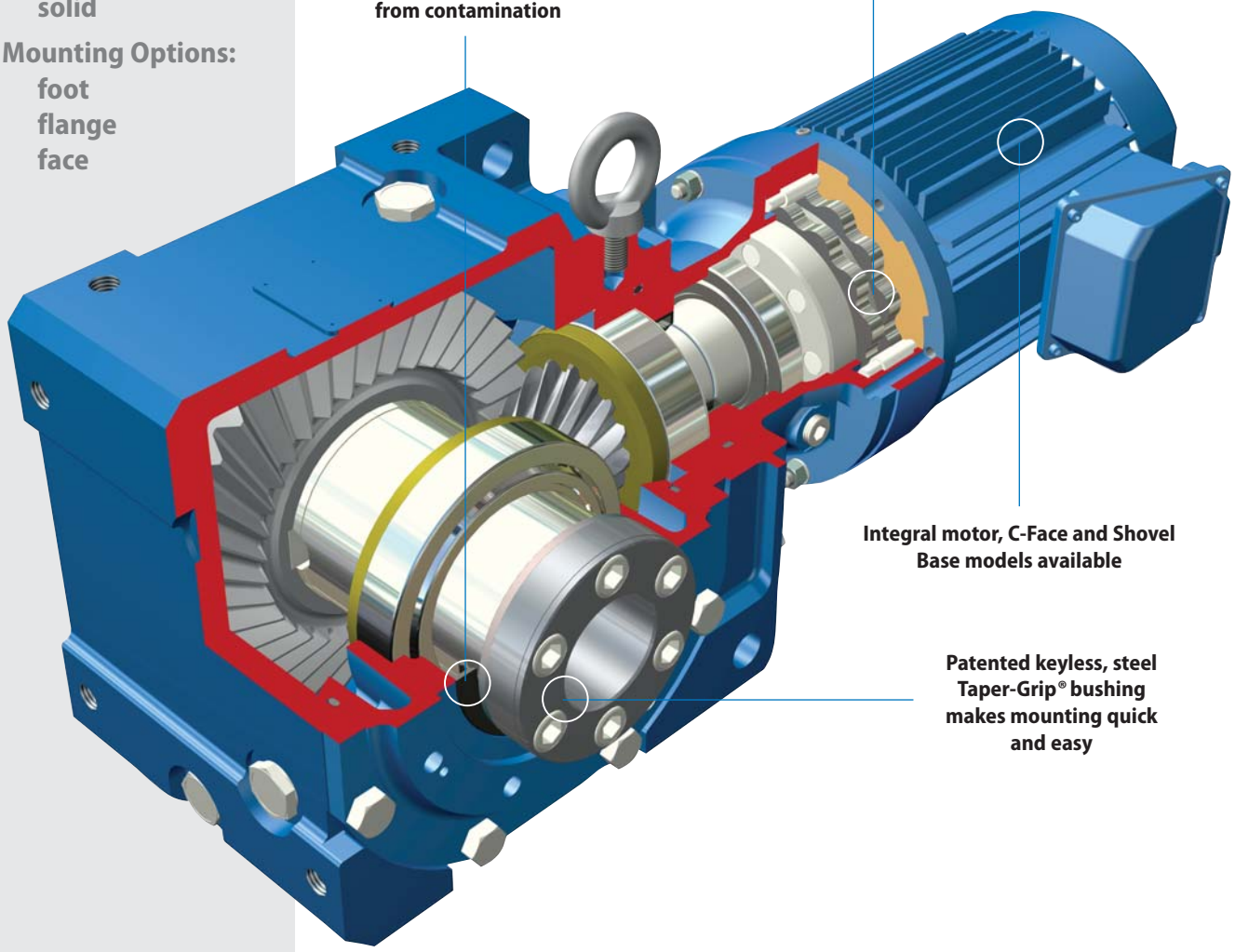
	NUT,HEX,3/8-16								
90	P0201080216 SUBASSY,SUPPORT LEG	0	P0201080216-.DWG		/A4	M		2.0000	ea
100	1064-183/4 BRACKET,PIVOT LOCKING	0	1064-183-.DWG		304 SST	P		2.0000	ea
110	3022-006/18 SCR,HEX CAP,1/2-13X1 1/4 LG	0			18-8	P		4.0000	ea
120	3024-005/18 WASHER,FL,1/2	0			18-8	P		4.0000	ea
130	3025-005/18 WASHER,SPT LK,1/2	0			18-8	P		4.0000	ea
140	3139-447/D STATION,E-STOP,NEMA 4X PLASTIC	A	3139-447A.DWG		See DWG	P		1.0000	ea
150	3076-100/D VALVE,SOLENOID,1 1/4" NPT ASCO 8210G055 (120/1/60)	0	3076-100-.DWG	1 1/4"NPT	Brass	P		1.0000	ea
160	5159-132-001/A6 SUBASSY,SWITCH,FLOAT,MOUNTING	A	5159-132-001A.DW		A6	M		1.0000	ea

Screen Drive Reducer Data

Cyclo® BBB Bevel Buddybox

Flexible configurations

- Shaft Options:
  - hollow
  - solid
- Mounting Options:
  - foot
  - flange
  - face



Cyclo® Quality and Reliability, Right Angle Design

- High performance steel gearing components deliver **up to 94% efficiency**

Product Description

Sumitomo's Cyclo® Bevel Buddybox (Cyclo® BBB) speed reducers and gearmotors are the **ultimate right angle drives for challenging applications.** The Cyclo® BBB combines the quiet, efficient and reliable performance of the Cyclo® technology input with the **rugged spiral bevel** gearbox output. The **modular design** provides a compact, torque-dense product with the most flexible range of output speed and torque combinations available. The Cyclo® BBB easily adapts to shaft-mounted as well as solid shaft mounting arrangements. Sumitomo's patented Taper Grip® bushing system enhances the Cyclo® BBB value by offering a simple shaft-mounting device that **provides self-aligning, backlash-free torque transmission** to the driven shaft. The Cyclo® BBB and Taper Grip® bushing system provide solutions for the most demanding applications.

Features & Benefits

- **Cycloidal speed reduction technology**
  - ~ Quiet, efficient and reliable operation with high torque density and compact size
- **Modular design**
  - ~ Interchangeable cast iron housings in foot, flanged or face mount configurations
- **High performance steel spiral bevel gearing**
  - ~ Deliver efficiencies of up to 94% across the entire product range
- **Double output seals**
  - ~ Virtually leak-free operation and optimal protection from lubrication contamination
- **Taper Grip® Bushing**
  - ~ Simple, steel, keyless shaft mounting system resists fretting and eases unit installation and removal from driven shaft

Specifications Summary

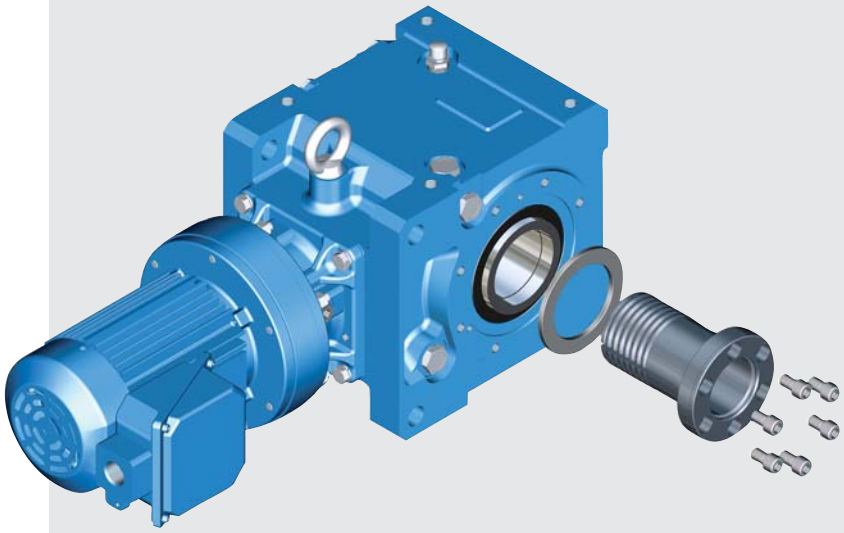
Ratios:	11:1 to 26,000:1 and greater
Torque Capacity:	94,700 in. lbs.
HP:	1/8 to 40
Mounting:	Hollow Shaft, Solid Shaft with Foot, Flange, Face
Options:	Integral Motor, C-Face and Shovel Base
Motor Standards:	NEMA, IEC, JIS, UL, CSA, CE

Keyless, steel Taper-Grip® bushing makes mounting of hollow shaft units easy and economical

The Sumitomo **Taper-Grip®** bushing is a keyless, torque transmission device integrated into the shaft mounted, right angle Cyclo® BBB reducer and gearmotor product lines.

The **unique, patented design** has a number of benefits:

- Easy mounting and removal of the unit to and from the driven shaft
- Standard bore sizes require no shaft preparation such as a keyway, undercut, or keeper plate
- Backlash free torque transmission
- Works with standard shafting, no special tolerances required
- Automatic shaft center alignment
- Resistant to fretting and corrosion
- Multiple stock bore sizes for quick delivery.



Applications

- Material Handling
- Asphalt Mixers
- Capstan Drive
- Rolling Mill Table
- Wire Drawing Machines
- Food Processing
- Belt Filter Presses
- Shredders/Compactors

Standard Specifications

		Standard Specifications	Standard Specifications with Built-In Brake
~~3-Phase Integral Motor~~	**~~Capacity Range:~~**	~~1/8 HP ~ 40 HP, 4P~~	~~1/8 HP ~ 15 HP, 4P: FB Brake~~ ~~20 HP, 4P: CMB Brake~~ ~~25 HP ~ 40 HP, 4P: ESB Brake~~
	~~Enclosure:~~	~~Totally enclosed fan cooled type~~ ~~(1/8 HP, 4P Totally enclosed non ventilated)~~	~~Totally enclosed fan cooled type~~ ~~(1/8 HP, 4P Totally enclosed non ventilated)~~
	~~Power Supply:~~	~~230/460 Volts, 60 Hz~~ ~~575 Volts, 60 Hz~~	~~230/460 Volts, 60 Hz~~ ~~575 Volts, 60 Hz~~
	~~Insulation:~~	~~3/4 ~ 30 HP: Class B~~ ~~40 HP: Class F~~	~~3/4 ~ 20 HP: Class B~~
	~~Time Rating~~	~~Continuous~~	~~Continuous~~

Reducer	**Reduction:**	Combination of Cyclo input and right angle spiral bevel gear output.
	Lubrication:	Cyclo portion is grease or oil lubricated; Bevel portion is oil lubricated.
	Seals:	Nitrile material, dual lipped, double output seals.
	Material:	Rugged cast iron housings
	Paint Color:	~~Blue, Muenters color number 6.5PB 3.6/8.2~~ STEEL-IT WASHDOWN DUTY SST COATING
	Bearings:	Tapered roller bearings on geared output; ball bearings on Cyclo input.

Ambient Conditions	**Installation Location:**	~~Indoors (Minimal dust and humidity)~~ INDOOR / OUTDOOR
	Ambient Temperature:	14°~104° F (-10° ~ 40° C)
	Ambient Humidity:	Under 85%
	Elevation:	Under 3,281 ft. (1000 meters)
	Atmosphere:	Well ventilated location, free of corrosive gases, explosive gases, vapors and dust.

NOTE: WASHDOWN DUTY MODIFICATIONS PROVIDED ON GEAR REDUCERS

Shaft Rotation

On single reduction Cyclo BBB speed reducers, ratios 11 through 305, the slow speed shaft rotates in a reverse direction to that of the high speed shaft.

On double reduction units, ratios 357 through 26,492, both the high speed and the slow speed shaft rotate in the same direction.

Input Speeds

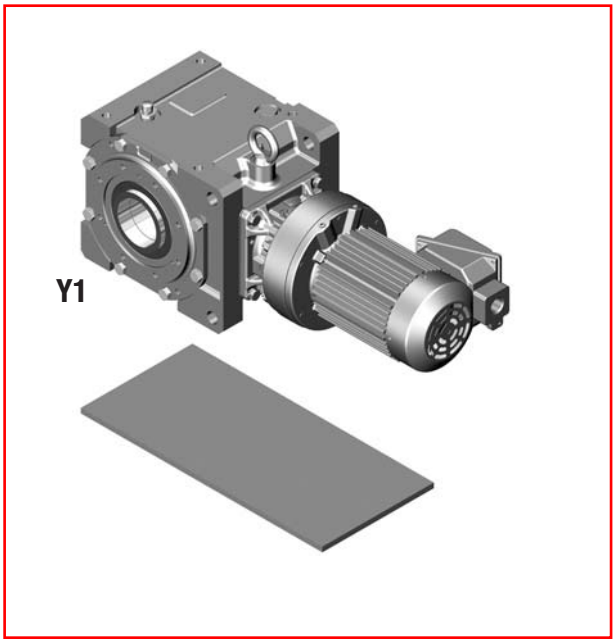
In general terms, the standard input speeds of single reduction units are 1750 and 1165 RPM. When non-standard input speeds are used, the horsepower and torque ratings will also vary.

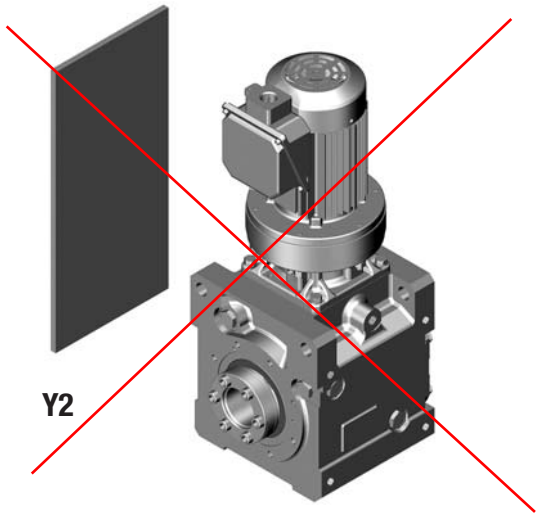
Thermal Capacity

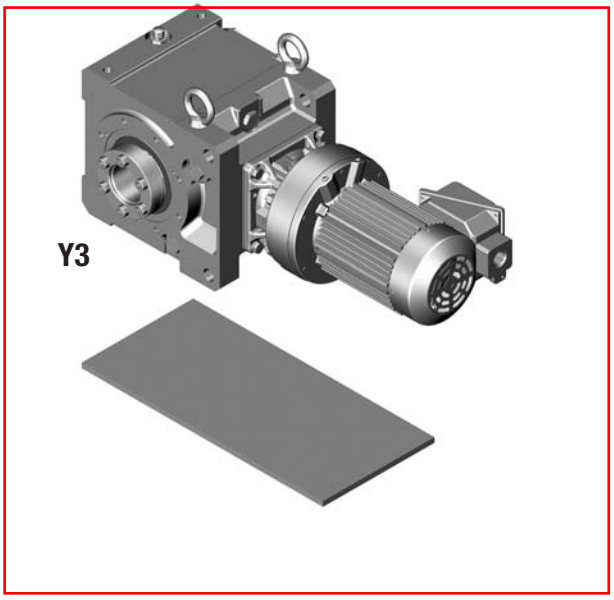
The Cyclo BBB speed reducer's smooth, almost frictionless operation all but eliminates the conventional limitations due to heat. In all sizes, Cyclo BBB speed reducers have thermal ratings that exceed their mechanical capacity.

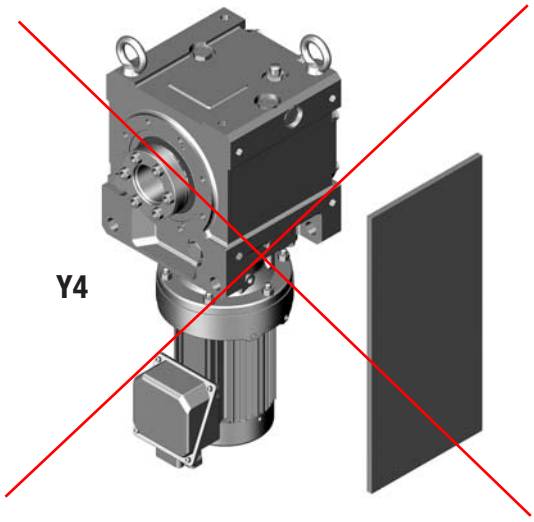
Mounting Positions

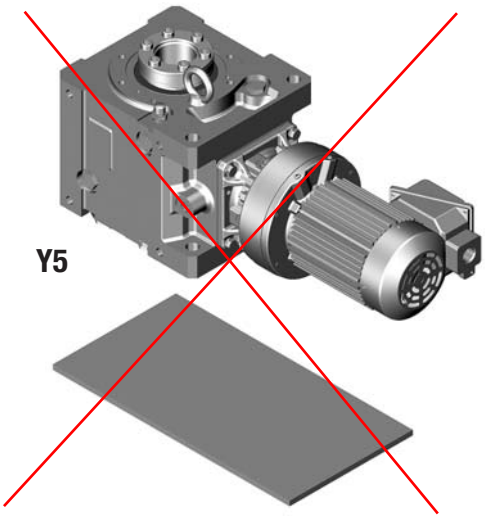
Please see the appendix for additional mounting configurations.

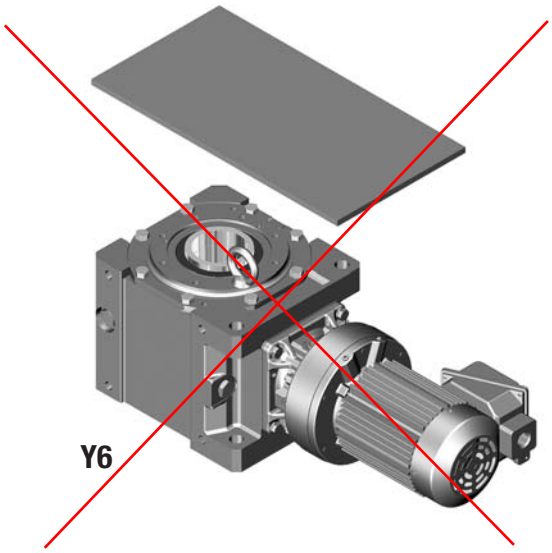






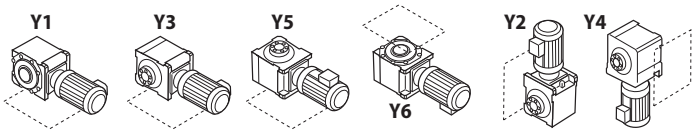






Frame Size Selection Tables 60 Hz, 1750 RPM

Double Reduction
Y1, Y2, Y3, Y4, Y5, Y6 Mounting Positions



Dimensions on pages 2.24–2.25

Output RPM	4.81	4.13	3.50	3.03	2.56	2.16	1.83	1.57	1.33	1.06	0.894	0.770	0.684	Frame Size
Ratio	364	424	501	578	683	809	956	1117	1320	1656	1957	2272	2559	
Input HP	–	–	–	–	–	–	–	–	0.576	0.576	0.576	0.576	0.512	3C14DA
Output Torque (in•lbs)	–	–	–	–	–	–	–	–	23985	30004	35491	41244	41244	
Hollow Shaft OHL (lbs)	–	–	–	–	–	–	–	–	3480	3480	3480	3480	3480	
Solid Shaft OHL (lbs)	–	–	–	–	–	–	–	–	2850	2850	2850	2850	2850	
Input HP	2.14	2.14	2.14	2.14	1.90	1.58	1.34	1.17	0.992	0.791	0.669	–	–	3C14DB
Output Torque (in•lbs)	24605	28588	33810	39032	40890	40271	40271	41244	41244	41244	41244	–	–	
Hollow Shaft OHL (lbs)	3480	3480	3480	3480	3480	3480	3480	3480	3480	3480	3480	–	–	
Solid Shaft OHL (lbs)	2850	2850	2850	2850	2850	2850	2850	2850	2850	2850	2850	–	–	
Input HP	3.60	2.92	2.62	2.25	–	–	–	–	–	–	–	–	–	3C14DC
Output Torque (in•lbs)	41244	38943	41244	40890	–	–	–	–	–	–	–	–	–	
Hollow Shaft OHL (lbs)	3480	3480	3480	3480	–	–	–	–	–	–	–	–	–	
Solid Shaft OHL (lbs)	2850	2850	2850	2850	–	–	–	–	–	–	–	–	–	
Input HP	–	–	–	–	2.12	1.79	1.51	1.29	1.09	0.872	0.738	0.635	0.564	3C16DA
Output Torque (in•lbs)	–	–	–	–	45493	45493	45493	45493	45493	45493	45493	45493	45493	
Hollow Shaft OHL (lbs)	–	–	–	–	3480	3480	3480	3480	3480	3480	3480	3480	3480	
Solid Shaft OHL (lbs)	–	–	–	–	2850	2850	2850	2850	2850	2850	2850	2850	2850	
Input HP	3.97	3.41	2.88	2.50	–	–	–	–	–	–	–	–	–	3C16DB
Output Torque (in•lbs)	45493	45493	45493	45493	–	–	–	–	–	–	–	–	–	
Hollow Shaft OHL (lbs)	3480	3480	3480	3480	–	–	–	–	–	–	–	–	–	
Solid Shaft OHL (lbs)	2850	2850	2850	2850	–	–	–	–	–	–	–	–	–	
Input HP	–	–	–	–	2.14	2.14	2.10	1.80	1.52	1.21	1.03	0.883	0.784	3D16DA
Output Torque (in•lbs)	–	–	–	–	46112	54609	63283	63283	63283	63283	63283	63283	63283	
Hollow Shaft OHL (lbs)	–	–	–	–	4810	4810	4810	4810	4810	4810	4810	4810	4810	
Solid Shaft OHL (lbs)	–	–	–	–	3930	3930	3930	3930	3930	3930	3930	3930	3930	
Input HP	4.50	4.50	4.01	3.48	2.94	2.48	–	–	–	–	–	–	–	3D16DB
Output Torque (in•lbs)	51600	60096	63283	63283	63283	63283	–	–	–	–	–	–	–	
Hollow Shaft OHL (lbs)	4810	4810	4810	4810	4810	4810	–	–	–	–	–	–	–	
Solid Shaft OHL (lbs)	3930	3930	3930	3930	3930	3930	–	–	–	–	–	–	–	

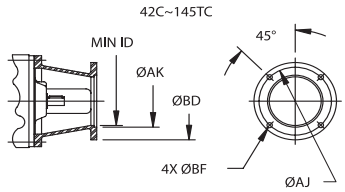
NOTE: Motor HP in GRAY is to overcome breakaway torque requirements in cold temperatures or high inertia applications. A torque limiting device is recommended to protect the unit or driven machine.

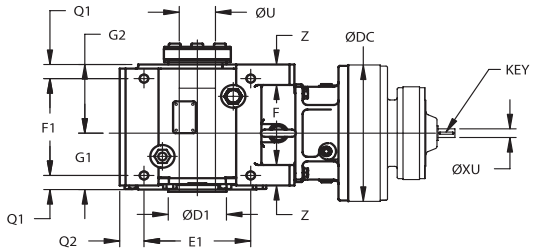
FOR A 3C14DB GEAR REDUCER WITH AN 1117:1 SPEED RATIO:

MOTOR INPUT (HP) (1800 RPM SYNCHRONOUS SPEED)	OUTPUT TORQUE (IN-LB)	SERVICE FACTOR
1/3	11,525	3.20
1/2	17,460	2.00
3/4	26,190	1.45
1	34,925	1.07
1.17	41,244	1.00

Dimensions

Double Reduction
LHY(J)-3A10DAY~3E17DCY

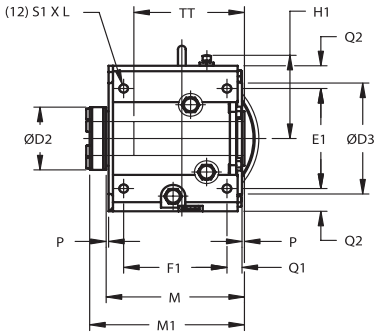


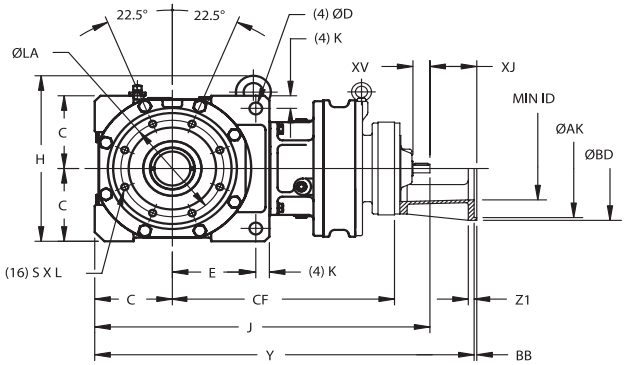


Min. Engagement	
FRAME SIZE	TT
~~3A~~	~~7.79~~
~~3B~~	~~9.33~~
3C	10.16
~~3D~~	~~11.82~~
~~3E~~	~~13.94~~

Dimensions shown are for reference only and are subject to change without notice, unless certified.

Certified prints are available after receipt of an order; consult factory.





All dimensions are in inches.

Model	C	E	F	K	Z	ØD	E1	F1	Q1	Q2	S1 x L	M
~~3A10DA~~ ~~3A12DA~~ ~~3A12DB~~	~~4.33~~	~~4.49~~	~~7.24~~	~~0.71~~	~~1.38~~	~~0.71~~	~~5.91~~	~~6.30~~	~~0.91~~	~~1.38~~	~~M12x0.79~~	~~8.50~~
~~3B12DA~~ ~~3B12DB~~ ~~3B14DA~~ ~~3B14DB~~	~~5.12~~	~~5.59~~	~~8.43~~	~~0.91~~	~~1.58~~	~~0.87~~	~~7.48~~	~~7.68~~	~~1.06~~	~~1.38~~	~~M16x1.02~~	~~10.20~~
~~3C14DA~~ 3C14DB ~~3C14DC~~ ~~3C16DA~~ ~~3C16DB~~	6.30	6.77	10.39	1.10	1.77	1.02	8.66	8.39	1.22	1.97	M20x1.30	11.22
~~3D16DA~~ ~~3D16DB~~ ~~3D16DC~~ ~~3D17DA~~ ~~3D17DB~~ ~~3D17DC~~	~~7.48~~	~~7.60~~	~~12.21~~	~~1.38~~	~~2.17~~	~~1.30~~	~~9.84~~	~~10.00~~	~~1.42~~	~~2.56~~	~~M24x1.57~~	~~13.39~~
~~3E17DA~~ ~~3E17DB~~ ~~3E17DC~~	~~8.46~~	~~9.06~~	~~14.17~~	~~1.38~~	~~2.17~~	~~1.30~~	~~11.81~~	~~11.14~~	~~1.50~~	~~2.56~~	~~M24x1.57~~	~~14.69~~

											ØU	
Model	P	G1	G2	H	H1	ØLA	ØD3	S x L	M1	ØD1	ØD2	Std & Max	Min
~~3A10DA~~ ~~3A12DA~~ ~~3A12DB~~	~~0.20~~	~~3.78~~	~~4.33~~	~~10.87~~	~~5.16~~	~~6.10~~	~~6.89~~	~~M10x0.67~~	~~9.84~~	~~3.35~~	~~4.09~~	~~2-3/16~~	~~1-11/16~~
~~3B12DA~~ ~~3B12DB~~ ~~3B14DA~~ ~~3B14DB~~	~~0.20~~	~~4.80~~	~~5.00~~	~~12.13~~	~~5.94~~	~~6.89~~	~~7.83~~	~~M12x0.79~~	~~11.54~~	~~3.94~~	~~4.49~~	~~2-7/16~~	~~1-15/16~~
~~3C14DA~~ 3C14DB ~~3C14DC~~ ~~3C16DA~~	0.20	4.88	5.94	14.33	7.20	8.35	9.61	M16x1.02	12.83	4.72	5.43	2-15/16	~~2-3/16~~
~~3D16DA~~ ~~3D16DB~~ ~~3D16DC~~ ~~3D17DA~~ ~~3D17DB~~ ~~3D17DC~~	~~0.28~~	~~5.83~~	~~7.01~~	~~16.69~~	~~8.39~~	~~10.04~~	~~11.61~~	~~M20x1.30~~	~~15.00~~	~~5.51~~	~~5.98~~	~~3-7/16~~	~~2-7/16~~
~~3E17DA~~ ~~3E17DB~~	~~0.28~~	~~6.14~~	~~7.99~~	~~19.61~~	~~9.37~~	~~11.02~~	~~12.60~~	~~M20x1.38~~	~~16.30~~	~~6.30~~	~~6.69~~	~~3-15/16~~	~~2-15/16~~

Double Reduction LHY(J)-3C10DAY~3E17DCY Dimensions

All dimensions are in inches.

With C-Face Adapter						
Model	NEMA C-Face	Y	Z1	Min. ID	XJ	Wt (lb)
3A10DA	42C	19.42	0.47	2.44	1.78	113
	48C	19.80	0.47	2.44	2.16	113
	56C	20.20	0.47	3.15	2.56	116
3A12DA	42C	19.89	0.47	2.44	1.78	131
	48C	20.27	0.47	2.44	2.16	131
	56C	20.67	0.47	3.15	2.56	133
3A12DB	48C	21.02	0.47	2.44	2.16	139
	56C-145TC	21.48	0.47	4.21	2.63	142
3B12DA	42C	22.13	0.47	2.44	1.78	195
	48C	22.51	0.47	2.44	2.16	195
	56C	22.91	0.47	3.15	2.56	197
3B12DB	48C	23.26	0.47	2.44	2.16	203
	56C-145TC	23.73	0.47	4.21	2.63	206
3B14DA	48C	23.18	0.47	2.44	2.16	202
	56C	23.58	0.47	3.15	2.56	204
3B14DB	48C	23.81	0.47	2.44	2.16	212
	56C-145TC	24.28	0.47	4.21	2.63	215
3C14DA	48C	26.69	0.47	2.44	2.16	305
	56C	27.09	0.47	3.15	2.56	308
3C14DB	48C	27.31	0.47	2.44	2.16	316
	56C-145TC	27.78	0.47	4.21	2.63	318
3C14DC	143TC-145TC	28.02	0.47	4.21	2.63	320
	182TC-184TC	28.84	0.47	5.43	3.45	324
3C16DA	56C-145TC	28.69	0.47	4.21	2.63	369
3D16DA	48C	32.24	0.47	2.44	2.16	514
	56C-145TC	32.70	0.47	4.21	2.63	517
3D16DB	143TC-145TC	32.94	0.47	4.21	2.63	521
	182TC-184TC	33.76	0.47	5.43	3.45	525
3D16DC	182TC-184TC	34.16	0.47	5.43	3.37	542
	213TC-215TC	35.16	1.47	5.43	4.37	544
3D17DA	56C-145TC	32.51	0.47	4.21	2.63	548
3D17DB	143TC-145TC	32.74	0.47	4.21	2.63	552
	182TC-184TC	33.57	0.47	5.43	3.45	556
3D17DC	182TC-184TC	34.47	0.47	5.43	3.37	569
	213TC-215TC	35.47	1.47	5.43	4.37	579
3E17DA	48C	34.01	0.47	2.44	2.16	708
	56C-145TC	34.48	0.47	4.21	2.63	711
3E17DB	143TC-145TC	34.71	0.47	4.21	2.63	715
	182TC-184TC	35.54	0.47	5.43	3.45	719
3E17DC	182TC-184TC	36.44	0.47	5.43	3.37	732
	213TC-215TC	37.44	1.47	5.43	4.37	743

Free Shaft Input							
Model	ØXU	ØXV	Key	CF	ØDC	J	Wt (lb)
3A10DA	0.500	0.98	1/8x1/8x0.71	11.22	5.91	17.64	110
3A12DA	0.500	0.98	1/8x1/8x0.71	11.69	8.03	18.11	128
3A12DB	0.625	0.98	3/16x3/16x0.75	12.17	8.03	18.86	135
3B12DA	0.500	0.98	1/8x1/8x0.71	13.15	8.03	20.35	192
3B12DB	0.625	0.98	3/16x3/16x0.75	13.62	8.03	21.10	198
3B14DA	0.500	0.98	1/8x1/8x0.71	13.82	9.06	21.02	198
3B14DB	0.625	0.98	3/16x3/16x0.75	14.17	9.06	21.65	207
3C14DA	0.500	0.98	1/8x1/8x0.71	16.14	9.06	24.53	302
3C14DB	0.625	0.98	3/16x3/16x0.75	16.50	9.06	25.16	311
3C14DC	0.625	0.98	3/16x3/16x0.75	17.05	9.06	25.39	313
3C16DA	0.625	0.98	3/16x3/16x0.75	17.40	11.81	26.06	362
3D16DA	0.625	0.98	3/16x3/16x0.75	20.24	11.81	30.08	509
3D16DB	0.625	0.98	3/16x3/16x0.75	20.79	11.81	30.31	514
3D16DC	0.750	1.38	3/16x3/16x1.02	20.87	11.81	31.22	529
3D17DA	0.625	0.98	3/16x3/16x0.75	20.04	13.39	29.88	540
3D17DB	0.625	0.98	3/16x3/16x0.75	20.59	13.39	30.12	545
3D17DC	0.750	1.38	3/16x3/16x1.02	20.75	13.39	31.10	556
3E17DA	0.625	0.98	3/16x3/16x0.75	21.02	13.39	31.85	703
3E17DB	0.625	0.98	3/16x3/16x0.75	21.57	13.39	32.09	708
3E17DC	0.750	1.38	3/16x3/16x1.02	21.73	13.39	33.07	719

NEMA C-Face Adapter	ØAJ	ØAK	ØBD	BB	ØBF
42C-48C	3.75	3.00	4.33	-	0.28
56C-145TC	5.87	4.50	6.69	-	0.43
182TC-256TC	7.25	8.50	8.98	0.22	0.55

Dimensions shown are for reference only and are subject to change without notice, unless certified.
Certified prints are available after receipt of an order; consult factory.

Sumitomo Drive Technologies

Taper Grip® Bushing Installation Guide

Introduction

The keyless Taper-Grip® bushing system provides simple and reliable shaft attachment for Sumitomo Speed reducers and gearmotors. This system allows bi-directional shaft rotation and stop-start operation with a powerful, slip-free grip. To assure peak performance of your equipment, please read, understand and follow these installation instructions.

Safety

Disconnect all power sources from the equipment before beginning this installation procedure. Handle the components with care and avoid all sharp or machined edges to prevent personal injury or damage to the components.

Before Installing Unit on Driven Shaft (Steps 1-7)

Carefully inspect the driven equipment shaft. Remove all burrs, corrosion, lubricants, and foreign matter from the shaft surface. Verify the shaft diameter is within the dimensional tolerances shown in Table 1.

Table 1 Driven Shaft Tolerances

Shaft Diameter (inches)	Shaft Tolerance (inches)
~~3/4" – 1 1/8"~~	~~+0" – 0.005"~~
~~1 3/16" – 2"~~	~~+0" – 0.006"~~
2 1/16" – 3-1/8"	+0" – 0.007"
~~3 3/16" – 4 3/4"~~	~~+0" – 0.008"~~
~~4 13/16" – 6 1/2"~~	~~+0" – 0.009"~~

Clean all surfaces of the shaft, the bushing, the thrust collar and the unit bore with solvent to remove all grease and oil.

Step 1 – Remove the Taper-Grip® bushing safety cover (see Fig. 2).

Step 2 – Remove the cap screws from the bushing. Lightly oil the threads of the cap screws and partially re-insert them into the threaded holes in the bushing flange. The ends of the cap screws should not extend beyond the rear face of the bushing flange.

Step 3 – Slide the thrust collar onto the Taper-Grip® bushing (see Fig. 3).

Step 4 – Apply a thin layer of anti-seize paste **to the male threads of the Taper-Grip® Bushing only** (see Fig.4). Based on tests, Sumitomo recommends Bostik Never-Seez Regular Grade or equivalent. Ensure that anti-seize paste does not enter the Taper-Grip® Bushing bore. **Caution: Do not apply anti-seize paste to the female threads in the hub.**

Step 5 – Carefully thread the Taper-Grip® bushing into the hub of the speed reducer or gearmotor until the thrust collar solidly engages the unit hub surface and the bushing flange (see Fig. 5). **Caution: Do not cross-thread. Bushing should thread easily into hub.**

Step 6 – Unscrew the Taper-Grip® bushing to create a 1mm (0.04") gap between the thrust collar and the bushing flange.

Step 7 – Hand-tighten the cap screws until they firmly press the thrust collar against the unit hub surface. The unit is ready for installation on the driven shaft.

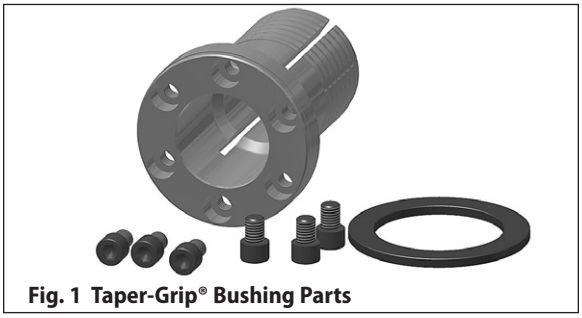


Fig. 1 Taper-Grip® Bushing Parts

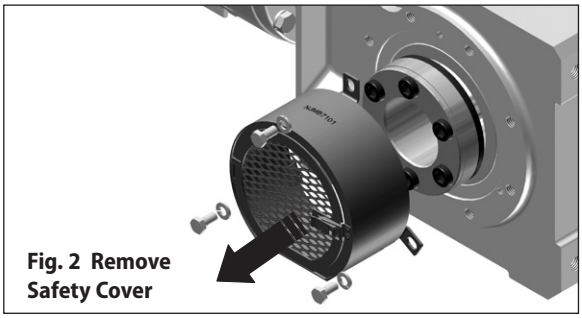


Fig. 2 Remove Safety Cover

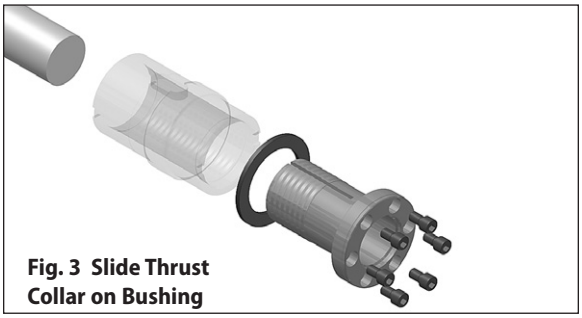


Fig. 3 Slide Thrust Collar on Bushing

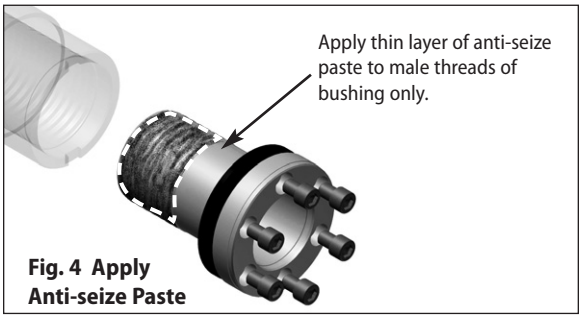


Fig. 4 Apply Anti-seize Paste

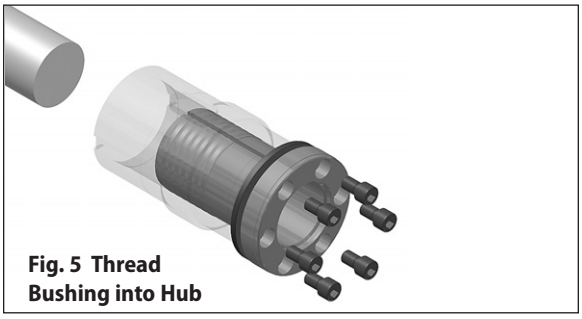


Fig. 5 Thread Bushing into Hub

Taper Grip® Bushing Installation Guide continued

Unit Installation

Step 8 – Position unit with the bushing flange located on the outboard side of the unit. Align the bushing with the driven shaft. Slide the unit onto the driven shaft as close to the driven shaft support bearing as possible. Ideally, the driven shaft should extend beyond the bushing flange face (see Fig. 7). Refer to Fig. 6 and Table 2 below for minimum shaft to bushing engagement. For maximum depth to the end of the shaft, refer to Fig. 6 and Table 3 below.

Table 2 Minimum Shaft to Bushing Engagement

Minimum Shaft Engagement (TT)								
HSM			Cyclo® HBB			Cyclo® BBB		
Model	mm	in.	Model	mm	in.	Model	mm	in.
107C	119.5	4.70	Z	113.5	4.47	3A, 2A	209	8.23
115D	127.5	5.02	A	127	5.00	3B, 2B	243	9.57
203E	136	5.35	B	144	5.67	3C, 2C	280	11.02
207F	153	6.02	C	187	7.36	3D, 2D	327	12.87
215G	183	7.20	D	205	8.07	3E, 2E	360	14.17
307H	205	8.07	E	225	8.86			
315J	215	8.46						
407S	219	8.62						
415K	217	8.54						
507L	285	11.22						
608M	335	13.19						

Table 3 Maximum Depth to Shaft End

Maximum Depth to Shaft End (TS)								
HSM			Cyclo® HBB			Cyclo® BBB		
Model	mm	in.	Model	mm	in.	Model	mm	in.
107C	31	1.22	Z	31	1.22	3A, 2A	35	1.38
115D	34	1.34	A	35	1.38	3B, 2B	45	1.77
203E	35	1.38	B	45	1.77	3C, 2C	40	1.57
207F	45	1.77	C	40	1.57	3D, 2D	50	1.97
215G	40	1.57	D	50	1.97	3E, 2E	51	2.01
307H	50	1.97	E	51	2.01			
315J	51	2.01						
407S	63	2.48						
415K	70	2.76						
507L	70	2.76						
608M	70	2.76						

Step 9 – With a torque wrench, tighten the cap screws in 20% increments to engage the bushing system. Use the appropriate tightening pattern ("star-pattern" see Fig. 7) to assure complete bushing engagement. Tighten each cap screw to the torque values shown in Table 4.

If the shaft is recessed in the bushing, fill the void with grease to prevent corrosion and fouling.

Step 10 – Please read, understand and follow the instructions shown in the reducer/gearmotor installation and operating manual to complete the unit installation and attach the torque arm.

Step 11 – After the reducer has been running for 20 to 30 hours, re-torque the screws to the values in Table 4. Screw torques should be subsequently checked at normal service intervals (i.e. every 6 months).

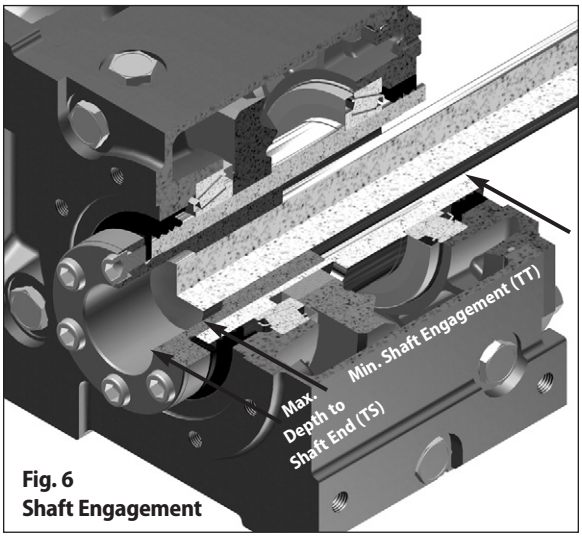


Fig. 6
Shaft Engagement

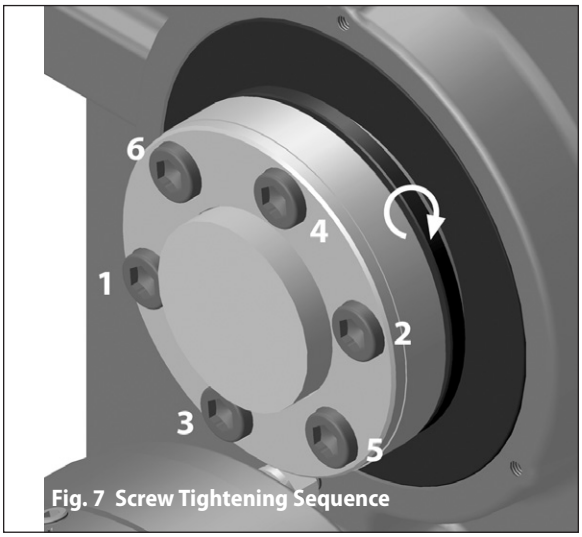


Fig. 7 Screw Tightening Sequence

Table 4 Cap Screw Tightening Torques

HSM Model	Cyclo® HBB Model	Cyclo® BBB Model	Cap screws (JIS Grade 12.9) Qty.	Size	Cap screw Torque Nm	Lb.Ft.
107C	Z		6	M10x14	50	37
115D			6	M10x14	55	41
203E	A	3A, 2A	6	M12x16	75	56
207F	B	3B, 2B	6	M12x16	140	104
215G	C	3C, 2C	6	M16x20	250	185
307H	D	3D, 2D	6	M16x20	250	185
315J	E	3E, 2E	8	M16x20	250	185
407S			10	M16x20	250	185
415K			10	M16x35	300	223
507L			12	M16x35	300	223
608M			16	M16x35	300	223

Taper Grip® Bushing Installation Guide continued

Removal Procedure

Step 1 – Remove the Taper-Grip® bushing safety cover (see Fig. 8).

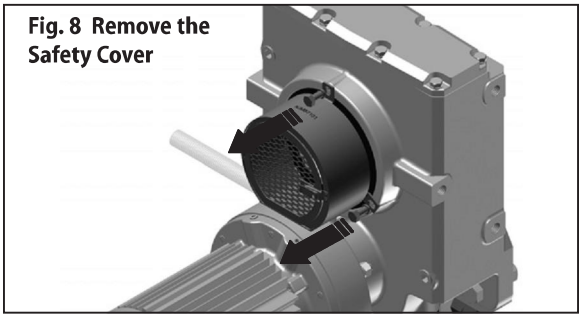


Fig. 8 Remove the Safety Cover

Step 2 – Before removing the reducer/gearmotor from the driven shaft, externally support the unit so that all its weight is removed from the driven shaft (see Fig. 9). **Caution: Do not raise the unit too high. It may cause the shaft to bind.**

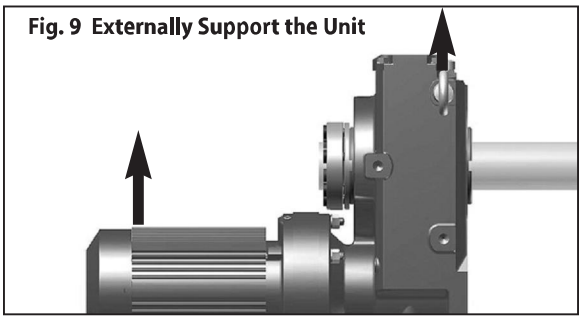


Fig. 9 Externally Support the Unit

Step 3 – Check the Taper-Grip® Bushing to assure that there is a gap between the thrust collar and the bushing flange. If no gap exists, unit removal may be difficult (see Fig. 10).

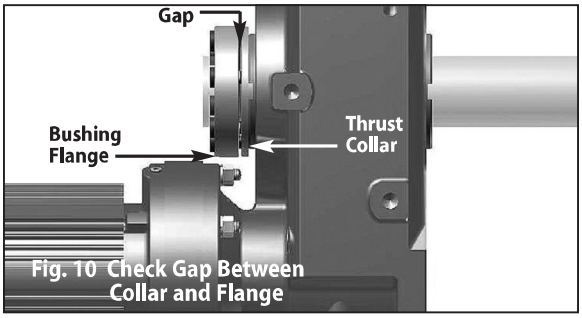


Fig. 10 Check Gap Between Collar and Flange

Step 4 – Spray a liquid penetrant onto each of the Taper-Grip® Bushing cap screws. Allow time for the penetrant to settle into the threads of the cap screws. (see Fig. 11).

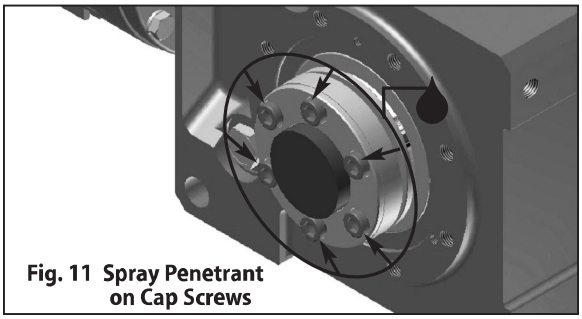


Fig. 11 Spray Penetrant on Cap Screws

Step 5 – After the liquid penetrant has been allowed to settle, remove the cap screws one at a time (see Fig 12).

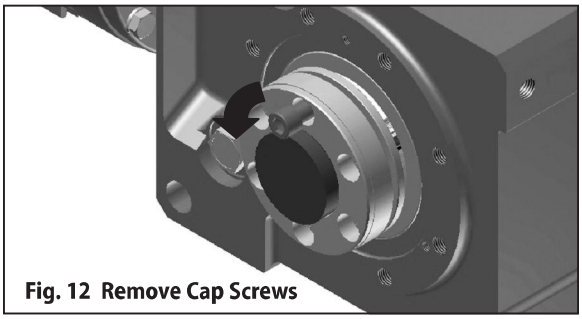


Fig. 12 Remove Cap Screws

Step 6 – Place a copper or brass bar against the flange of the Taper-Grip® Bushing and carefully strike end of bar with a hammer to release bushing (see Fig 13).

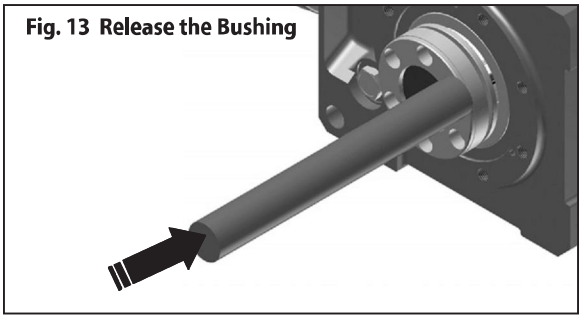


Fig. 13 Release the Bushing

Step 7 – After releasing the bushing, reinstall the cap screws by hand only. Stop tightening them once they touch the thrust collar. They will ensure the reducer will not slide against the bushing and clamp it against the shaft when the reducer is removed. Apply a liquid penetrant to the shaft where it contacts the bushing. Allow time for the liquid to penetrate between the bushing and the shaft, then carefully slide the unit off of the shaft. (see Fig 14). **Note: If the bushing releases, but the unit cannot be removed from the shaft, apply a puller to the bushing to push the shaft free.**

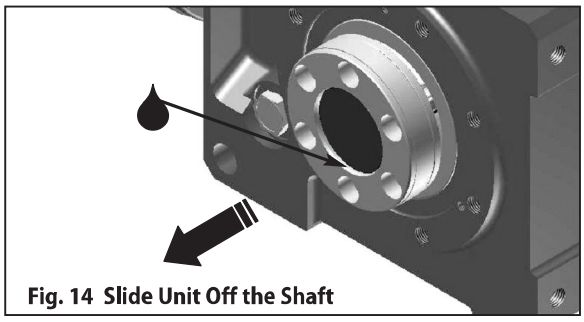


Fig. 14 Slide Unit Off the Shaft

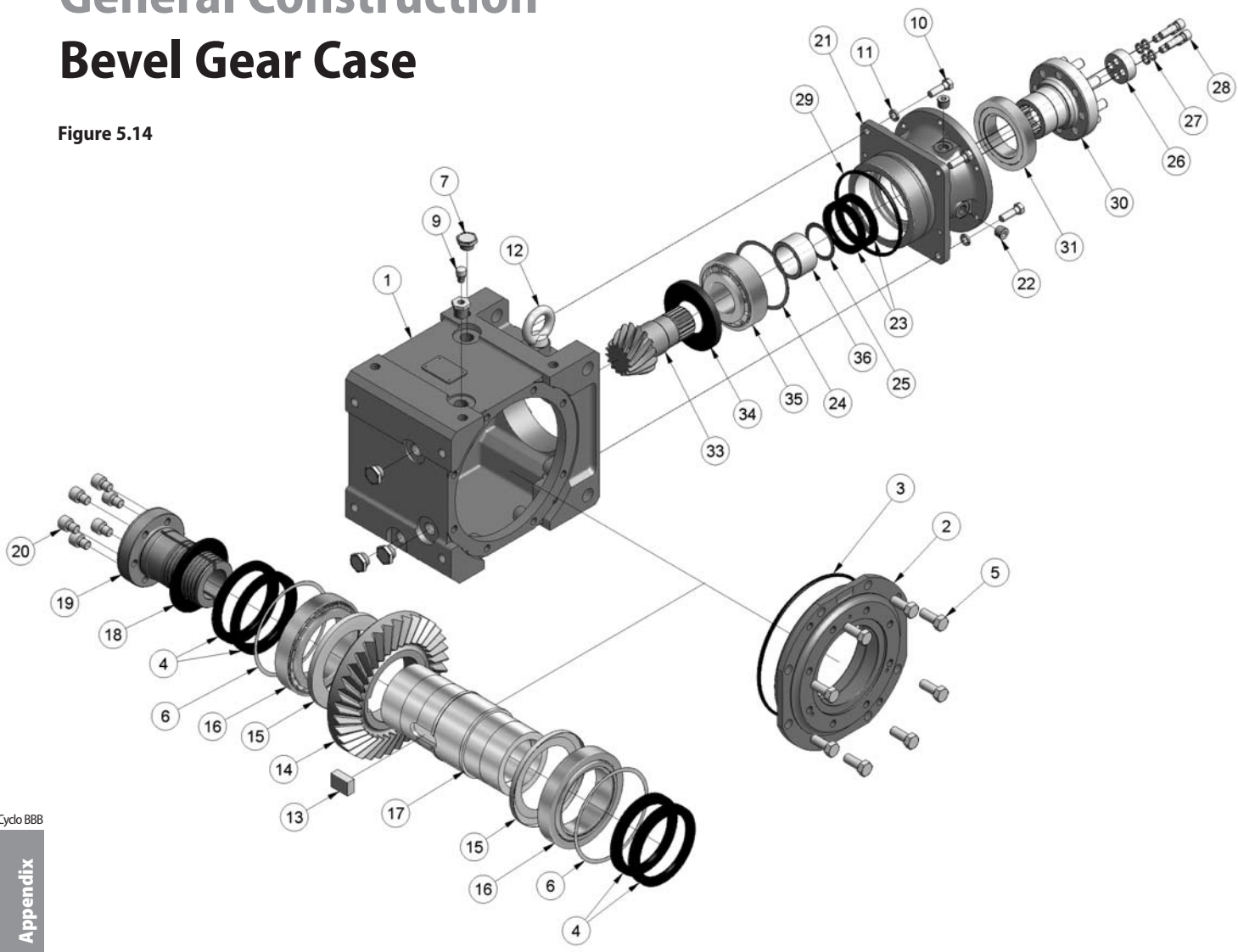
NOTE:
TO COMPLETE THE INSTALLATION, APPLY GREASE OR AN ANTI-CORROSION PASTE TO THE EXPOSED SHAFT ON BOTH ENDS OF THE GEAR REDUCER AFTER THE TAPER BUSHING IS INSTALLED AND THE BUSHING BOLTS ARE FULLY TIGHTENED. THEN, INSTALL THE BUSHING COVER.

Parts List

General Construction

Bevel Gear Case

Figure 5.14



Parts List continued

Table 5.16 Parts Code Numbers

			Unit Size				
Item No.	Description	QTY	A	B	C	D	E
1	Gear Housing	1	AE983LG	AE984LG	AE985LG	AE986LG	AE987LG
2	Output Cover	1	BL520LG	BL531LG	BL542LG	BL550LG	BL554LG
3	O-Ring	1	540NG1701-A-G	540NG2101-A-G	540NG2601-A-G	541N5.7-3258G	541N5.7-3757G
4	Oil Seal	4	531N8511013-G	531N10012513G	531N12015014G	531N14017014G	531N16019016G
5	Hex Head Bolt	8	001M010R030NG	001M012R030NG	001M016R040NG	001M020R050NG	001M020R050NG
6[2]	Shim	Varies	As required	As required	As required	As required	As required
7	Plug	8	343C008R- - -NG	343C008R- - -NG	343C012R- - -NG	343C012R- - -NG	343C012R- - -NG
9	Air Vent	1	DT206LG	DT206LG	DT206LG	DT206LG	DT206LG
10	Hex Head Bolt	4	001M010R030NG	001M010R030NG	001M012R040NG	001M016R050NG	001M016R050NG
11	Spring Washer	4	062W010- - - -NG	062W010- - - -NG	062W012- - - -NG	062W016- - - -NG	062W016- - - -NG
12	Eye Bolt	1	006C016R- - -NG	006C016R- - -NG	006C020R- - -NG	006C020R- - -NG	006C024R- - -NG
13	Key	1	233M2214021NG	233M2514028NG	233M2816040NG	233M3218050NG	233M3620060NG
14	Bevel Gear	1	AP0646G	AP0647G	AP0648G	AP0649G	AP0650G
15	Nilos Ring	2	50532017XAV-G	50532020XAV-G	50532024XAV-G	50532028XAV-G	50532032XAV-G
16	Tapered Roller Bearing	2	503T32017XU-G	503T32020XU-G	503T32024XU-G	503T32028XU-G	503T32032XU-G
17	Taper-Grip® Output Hub	1	BL937LG	BL938LG	BL939LG	BL940LG	BL941LG
18[3]	Thrust Plate	1	—	—	—	—	—
19	Taper-Grip® Bushing	1	As required	As required	As required	As required	As required
20[3]	Taper-Grip® Bushing Screws	Varies	—	—	—	—	—
21[4]	Flanged Casing	1	As required	As required	As required	As required	As required
22	Hex Socket Plug	Varies	As required	343C008R- - -NG	343C008R- - -NG	343C008R- - -NG	343C008R- - -NG
23	Oil Seal	2	530N50689- - -G	530N60759- - -G	530N709513- -G	530N9011513-G	530N9011513-G
24[2]	Shim	Varies	As required	As required	As required	As required	As required
25[2]	Shim	Varies	As required	As required	As required	As required	As required
26	End Plate	1	AW7028G	AW7030G	AW7032G	As required	AW7036G
27	Lock Washer	4	EU593WW-05	EU593WW-05	EU593WW-07	As required	EU593WW-09
28	Hex. Soc. Hd. Cap Screw	4	009M008R030NG	009M010R035NG	009M012R040NG	As required	009M016R055NG
29	O-Ring	1	540NG1101-A-G	540NG1301-A-G	540NG1501-A-G	540NG1751-A-G	540NG1851-A-G
30[5]	Pin Carrier	1	As required	As required	As required	As required	As required
31	Tapered Roller Bearing	1	As required	As required	As required	As required	As required
33	Bevel Pinion Shaft	1	BL513LG	BL525LG	BL536LG	As required	BL553LG
34	Nilos Ring	1	50532308AV- -G	50532310AV- -G	50532312AV- -G	50532314AV- -G	50532315AV- -G
35	Tapered Roller Bearing	1	503T32308U- -G	503T32310U- -G	503T32312U- -G	503T32314U- -G	503T32315U- -G
36	Collar	1	AW7027G	AW7029G	AW7031G	As required	AW7034G

Notes: [1] When ordering replacement parts, please indicate the complete unit model number, ratio and serial number.
[2] Shims are not available individually. They may be ordered as a complete set only.
[3] Item Numbers 18 and 20 are not available as individual parts. They come complete with the Taper-Grip® Bushing.
[4] The Flange Casing is determined based on the associated input Cyclo size.

Cyclo Parts List continued

Cyclo Reducer Input Section

Double Reduction

Figure 5.16

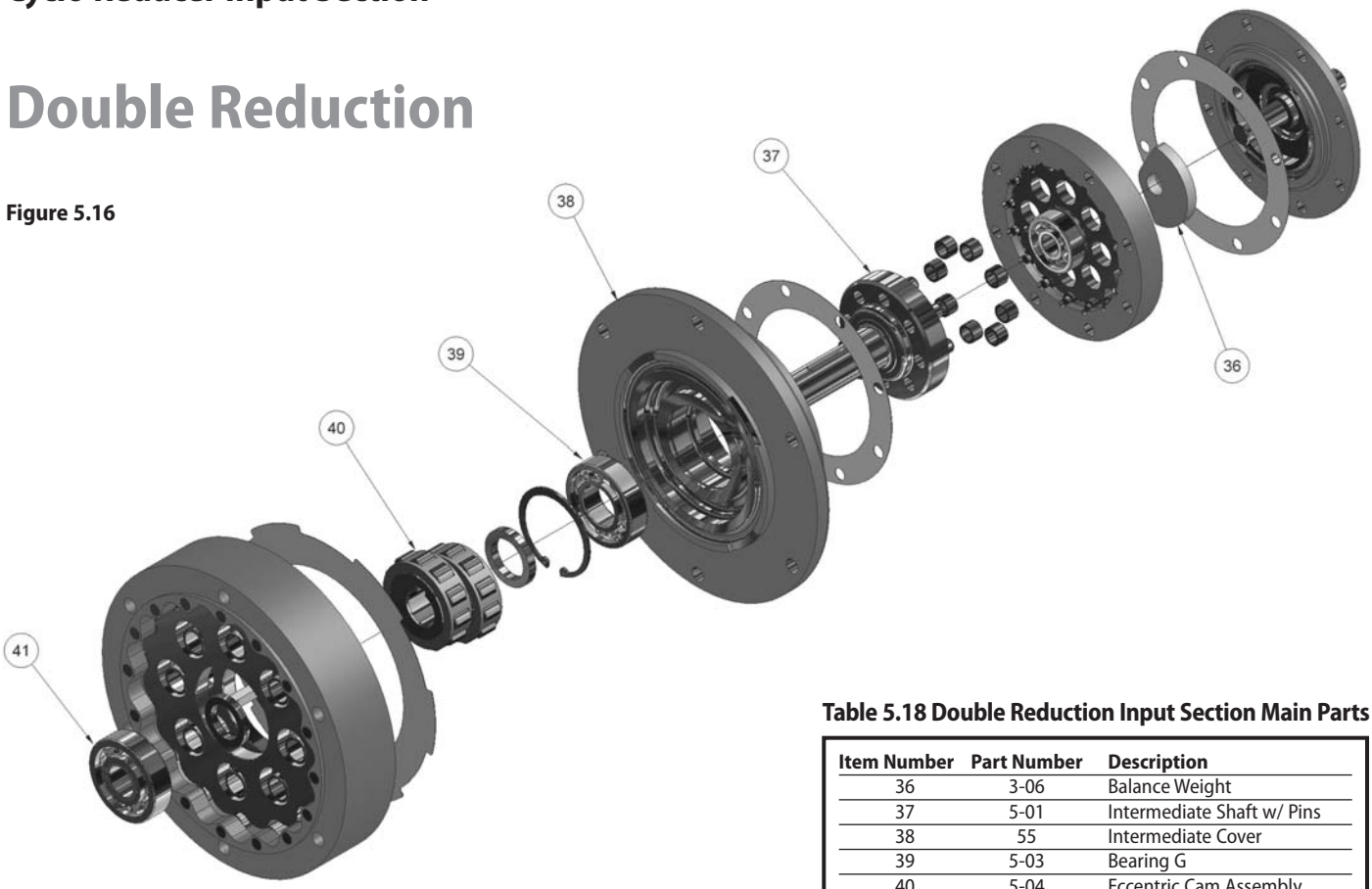


Table 5.18 Double Reduction Input Section Main Parts

Item Number	Part Number	Description
36	3-06	Balance Weight
37	5-01	Intermediate Shaft w/ Pins
38	55	Intermediate Cover
39	5-03	Bearing G
40	5-04	Eccentric Cam Assembly
41	5-02	Bearing F

NOTE: The parts listed are a general representation of the components found in a single and double reduction Cyclo.

Specific units may or may not contain all shown here.

Please consult the factory for specific part questions.

Lubrication

Oil lubricated models are not filled with oil prior to shipping.

Before operating, fill the unit with the appropriate amount of the correct lubricant for the mounting position (see Table 5.31 and Figure 5.28). When operating in winter or other relatively low ambient temperatures, use the lower viscosity oil specified for each ambient temperature range. Please consult the factory if the unit will be operated consistently in ambient temperatures other than 32°F–104°F.

Table 5.30 Lubrication Type Per Unit Size

Unit Size	Output (Gear Side)	Input (Cyclo Side) Motor Horizontal	Input (Cyclo Side) Motor Vertical
3A100, 3A105, 3A110, 3A115 3A120, 3A125, 3B120, 3B125	Oil Bath	Grease	Grease
3A140, 3A145 3B140, 3B145, 3C140, 3C145, 3B160, 3B165, 3C160, 3C165, 3D160, 3D165, 3C170, 3C175, 3D170, 3D175 3E170, 3E175		Oil Bath	Grease

Table 5.31 Standard Oils

Ambient Temperature (°F)	ChevronTexaco	Exxon Oil	Mobil Oil	Shell Oil	BP Oil
14 to 41°	EP Gear Compound 68	Spartan EP 68	Mobilgear 600 XP 68 (ISO VG 68)	Omala Oil 68	Energol GR-XP 68
32 to 95° STANDARD	EP Gear Compound 100, 150	Spartan EP 100 EP 150	Mobilgear 600 XP 100, 150 (ISO VG 100, 150)	Omala Oil 100, 150	Energol GR-XP 100 GR-XP 150
86 to 122°	EP Gear Compound 220, 320, 460	Spartan EP 220 EP 320 EP 460	Mobilgear 600 XP 200 320, 460 (ISO VG 220–460)	Omala Oil 220, 320 460	Energol GR-XP 220 GR-XP 320 GR-XP 460

Grease lubricated models are lubricated with grease prior to shipment from the factory.

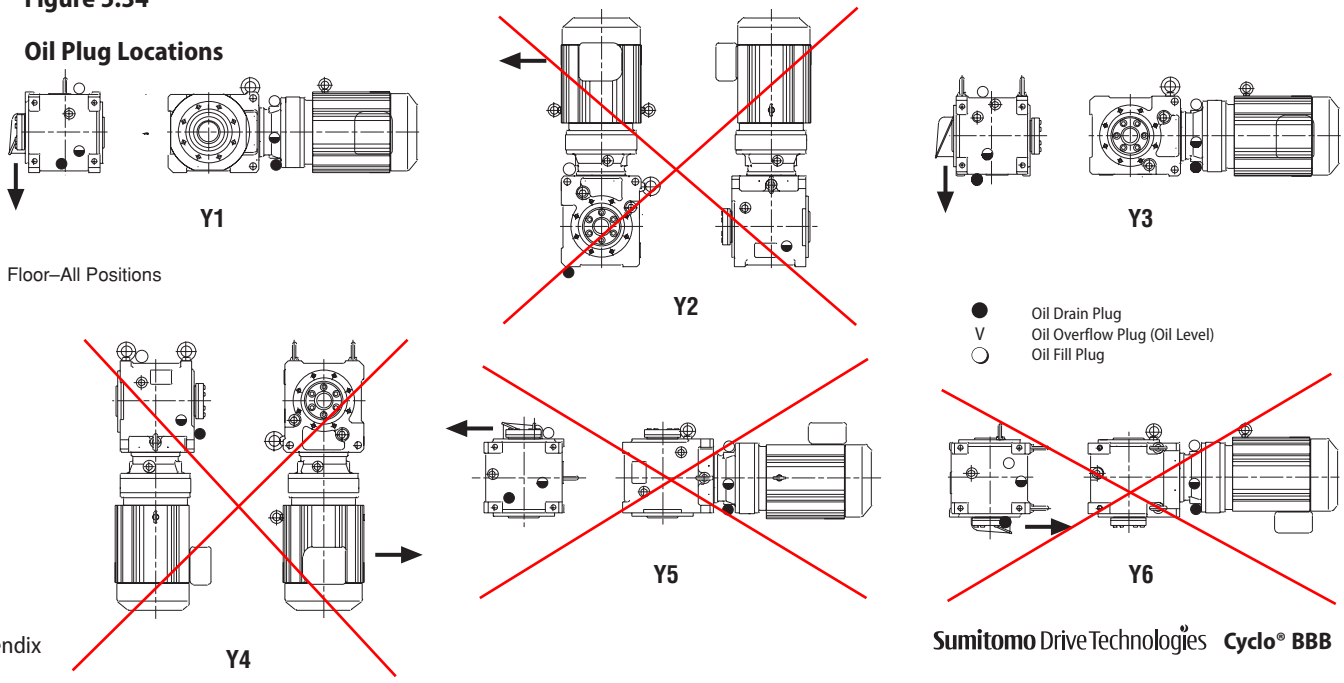
Adding grease prior to initial start-up is not required. If grease must be replenished or changed (see Grease Lubrication section), avoid using greases other than those shown in the Table 5.32. Please consult the factory when the units will be used in widely fluctuating temperatures, ambient temperatures other than those specified in Table 5.32, or when other special conditions exist for the application. When motors from another manufacturer will be used, please consult and adhere to the associated motor maintenance manual for the appropriate lubrication instructions.

Table 5.32 Standard Greases

Ambient Temperature (°F)	Reduction Ratio	Input (Cyclo Side)
14 to 122°	11, 18:1	Shell Alvania EP R0
	21:1 and higher	Exxon Unirex N2

Figure 5.34

Oil Plug Locations



Lubrication continued

Table 5.33 Oil Fill Quantities Unit: **U.S. Gallons** *G = Grease

Frame Size	Mounting Configuration											
	Y1		Y2		Y3		Y4		Y5		Y6	
	Output	Input*	Output	Input*	Output	Input*	Output	Input*	Output	Input*	Output	Input*
3A100, 3A105		G		G		G		G		G		G
3A110, 3A115	0.29	G	0.26	G	0.29	G	0.26	G	0.45	G	0.42	G
3A120, 3A125		G		G		G		G		G		G
3A140, 3A145		0.08		G		0.08		G		0.08		0.08
3B120, 3B125		G		G		G		G		G		G
3B140, 3B145	0.48	0.12	0.37	G	0.48	0.12	0.48	G	0.61	0.12	0.66	0.12
3B160, 3B165		0.20		G		0.20		G		0.20		0.20
3C140, 3C145		0.12 G		G		0.12 G		G		0.12		0.12
3C160, 3C165	0.87	0.20	0.92	G	0.87	0.20	1.16	G	0.95	0.20	1.4	0.20
3C170, 3C175		0.28		G		0.28		G		0.28		0.28
3D160, 3D165	1.16	0.18	1.32	G	1.16	0.18	1.11	G	1.48	0.18	1.59	0.18
3D170, 3D175		0.24		G		0.24		G		0.24		0.24
3E170, 3E175	1.95	0.24	1.93	G	1.95	0.24	1.59	G	1.90	0.24	2.80	0.24

Oil lubricated units are shipped without oil. Prior to initial start-up, the unit must be filled with the correct amount of oil (see Table 5.33). For those units where both the gear and Cyclo portions are oil lubricated, the oil must be filled in two separate locations, one on the gear housing and one on the Cyclo housing.

Grease lubricated models are lubricated at the factory. Additional grease does not need to be added prior to initial start-up.

CHART IS FOR SINGLE REDUCTION UNITS.
ON ALL DOUBLE REDUCTION UNITS, INPUT STAGE IS GREASE LUBRICATED.

Oil Replenishment and Change Interval

A. Maintain proper oil levels at all times.

B. An oil change after the first 500 hours of operation is highly recommended.

C. Sumitomo recommends an oil change every 2500 hours, or six months, whichever comes first. If a proper preventive maintenance program is implemented and maintained, a longer change period may be acceptable.

D. If the unit is running in a high ambient, high humidity, or corrosive environment, the lubricant will have to be changed more frequently. Consult the factory for recommendations.

E. Note: The Cyclo portion and Bevel portion, where applicable, must be filled with oil separately. Oil does not flow from one section to the other.

Grease Replenishment and Change Interval

A. On single reduction Cyclo Bevel Buddybox (Cyclo BBB) sizes 3A100~125 and 3B120~125, the Cyclo portion is grease lubricated as standard and therefore maintenance free. Consult the operations and maintenance manual for the grease change interval.

B. When mounting Cyclo BBB sizes 3A140~145, 3B140~145, 3B160~165, and all sizes of 3C, 3D, and 3E in the Y2 and Y4 positions, please consult the maintenance and operations manual for the proper grease replenishment and change interval for the Cyclo portion.

Sumitomo Drive Technologies
Long Term Storage Instructions

I. Oil Lubricated:

A. 6 Months to One Year Storage
   1. Fill with rust preventative oil or circulating oil.
   2. At approximately three-month intervals, rotate the input shaft a sufficient number of times to insure all internal components remain coated.
      Note: The higher the ratio, the greater the amount needed for proper lubrication.
   3. To return unit to operation
      a. Completely drain the rust preventative, or circulating oil from the unit
      b. Flush unit with the recommended operating oil.
      c. After flushing, fill the unit to the proper oil level with the recommended lubricating oil.

B. One Year or Longer Storage
   1. Treatment by Sumitomo before shipment
      a. No-load running with a rust preventative oil NP-10, then the oil is drained.
      b. Next NP-20 rust preventative lubricant is sprayed on the inside housing after draining the rust preventative lubricant or circulating oil.
      c. The oil filler cap is covered with tape or a polyethylene bag.
   2. Long Term Storage by customer after prepared by Sumitomo
      a. After a period of one year and each year afterward, customer is required to fill the unit with Shell VSA Circulating oil 100 to the recommended oil level and re-cover the oil filler cap.
   3. To return unit to operation
      a. Drain the rust preventative or circulating oil.
         Note: No operation with the rust preventative or circulating oil is permitted.
      b. Flush twice with the recommended unit oil before putting into operation.
      c. Fill to the proper level with the recommended oil.

II. Grease Lubricated:

A. Within one year, no action is required before operation.
B. For operation after storage longer than one year, it is recommended that the unit be disassembled and the grease changed. For single reduction maintenance free units, test run the unit with the grease filler plug removed, discharge excess grease, and put the plug back in place.

Special Note: Non-metallic parts such as oil seals, oil gauges, and oil filler plugs can be adversely affected by ambient conditions such as temperature, weather, and ultraviolet rays. After storing the unit for an extended period, carefully inspect the unit before starting operation. Replace all parts that have been affected.

Screen Drive Motor Data

BALDOR
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Product Information Packet

VEM3542

.75HP,1750RPM,3PH,60HZ,56C,3517M,TEFC,F1

Part Detail							
Revision:	T	**Status:**	PRD/A	**Change #:**		**Proprietary:**	No
Type:	AC	**Prod. Type:**	3516M	**Elec. Spec:**	35WGP667	**CD Diagram:**	CD0005
Enclosure:	TEFC	**Mfg Plant:**		**Mech. Spec:**	35J302	**Layout:**	35LYJ302
Frame:	56C	**Mounting:**	F1	**Poles:**	04	**Created Date:**	01-15-2008
Base:	N	**Rotation:**	R	**Insulation:**	F	**Eff. Date:**	06-10-2016
Leads:	9#18					**Replaced By:**	
Literature:		**Elec. Diagram:**					

Nameplate NP2116L							
CAT.NO.	VEM3542						
SPEC.	35J302P667G1						
HP	.75						
VOLTS	230/460						
AMP	2.28/1.14						
RPM	1750						
FRAME	56C	HZ	60	PH	3		
SER.F.	1.25	CODE	M	DES	B	CL	F
NEMA-NOM-EFF	84	PF	73				
RATING	40C AMB-CONT						
CC		USABLE AT 208V	2.48				
DE	6205	ODE	6203				
ENCL	TEFC	SN					
	SFA 2.64/1.32						

Parts List

Part Number	Description	Quantity
SA167237	SA 35J302P667G1	1.000 EA
RA155576	RA 35J302P667G1	1.000 EA
34FN3002B01	EXTERNAL FAN, PLASTIC, .637/.639 HUB W/	1.000 EA
S/P107-000-001	SUPER E PROC'S-FS, WS & CK PLTS	1.000 EA
NS2512A01	INSULATOR, CONDUIT BOX X	1.000 EA
35CB3007	35 CB CASTING W/.88 DIA. LEAD HOLE	1.000 EA
36GS1000SP	GASKET-CONDUIT BOX, .06 THICK #SV-330 LE	1.000 EA
51XB1016A07	10-16 X 7/16 HXWSSLD SERTYB	2.000 EA
11XW1032G06	10-32 X .38, TAPTITE II, HEX WSHR SLTD U	1.000 EA
35EP3100M02	FREP TEFC 203 BRG W/O GRSR (RAISED FH MT	1.000 EA
HW5100A03SP	WAVY WASHER (W1543-017)	1.000 EA
35EP3300A33	SPL FACE MTD EP -ENCL-205 BRG	1.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	2.000 EA
XY1032A02	10-32 HEX NUT DIRECTIONAL SERRATION	4.000 EA
51XB1214A16	12-14X1.00 HXWSSLD SERTYB	1.000 EA
35FH4005A32SP	IEC FH NO GRSR W/3 HOLES - PRIMED	1.000 EA
51XW1032A06	10-32 X .38, TAPTITE II, HEX WSHR SLTD S	3.000 EA
35CB4521GX	CONDUIT BOX LID KIT	1.000 EA
51XW0832A07	8-32 X .44, TAPTITE II, HEX WSHR SLTD SE	4.000 EA
HW2501D13SP	KEY, 3/16 SQ X 1.375	1.000 EA
HA7000A04	KEY RETAINER 0.625 DIA SHAFTS	1.000 EA
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	2.000 EA
MJ1000A02	GREASE, POLYREX EM EXXON (USe 4824-15A)	0.050 LB
MG1000Y03	MUNSELL 2.53Y 6.70/ 4.60, GLOSS 20,	0.017 GA

Parts List (continued)

Part Number	Description	Quantity
HA3100A12	THRUBOLT 10-32 X 7.375	4.000 EA
LC0005E01	CONN.DIA./WARNING LABEL (LC0005/LB1119N)	1.000 EA
MN416A01	TAG-INSTAL-MAINT no wire (1200/bx) 11/14	1.000 EA
NP2116L	ALUM SUPER-E UL CSA CC	1.000 EA
36PA1000	PKG GRP, PRINT PK1016A06	1.000 EA
PK3082	STYROFOAM CRADLE	1.000 EA

AC Induction Motor Performance Data

Record # 25206 - Typical performance - not guaranteed values

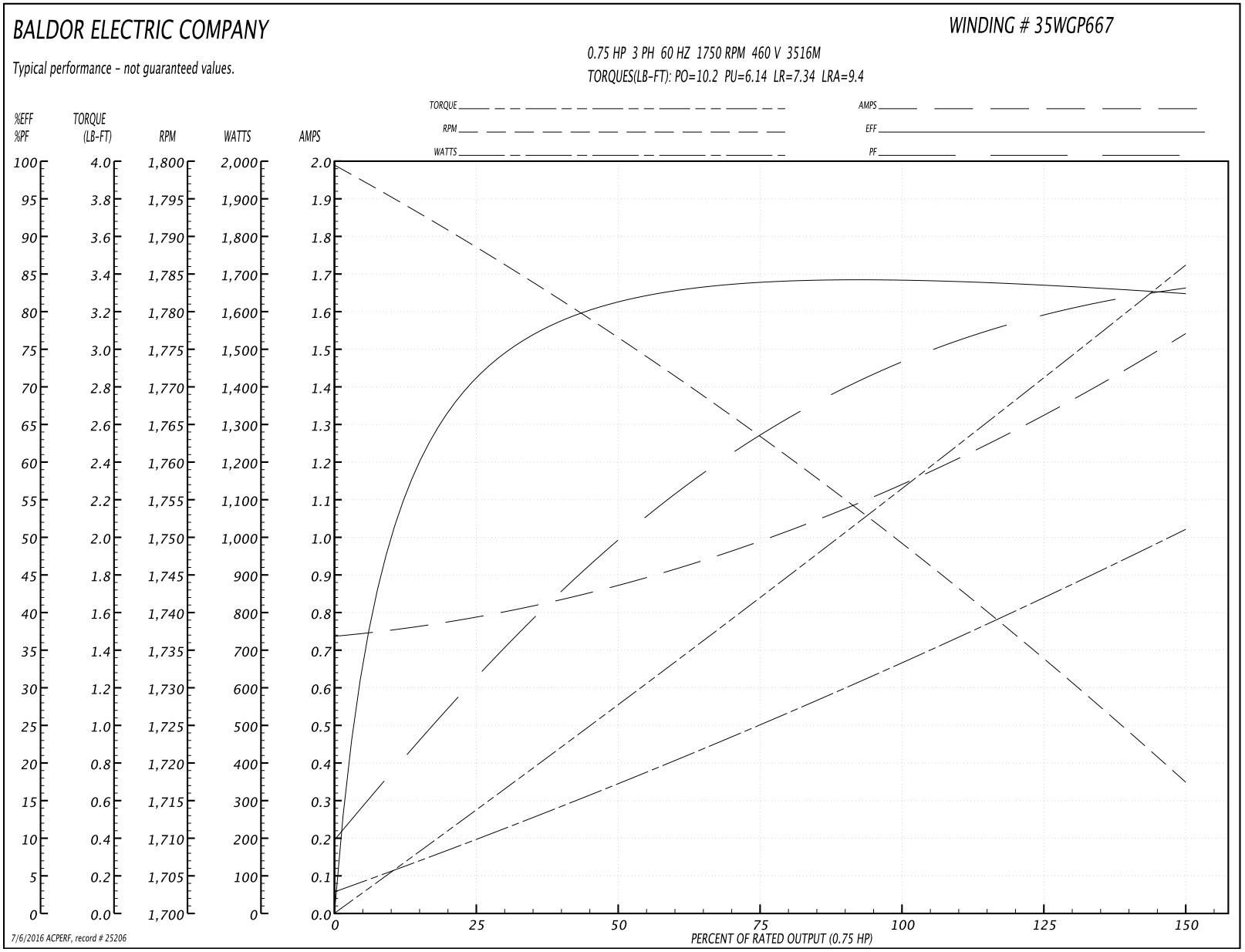
Winding: 35WGP667-R001	**Type:** 3516M	**Enclosure:** TEFC

Nameplate Data				460 V, 60 Hz: High Voltage Connection	
Rated Output (HP)	.75			Full Load Torque	2.225 LB-FT
Volts	230/460			Start Configuration	direct on line
Full Load Amps	2.28/1.14			Breakdown Torque	10.2 LB-FT
R.P.M.	1750			Pull-up Torque	6.14 LB-FT
Hz	60	Phase	3	Locked-rotor Torque	7.34 LB-FT
NEMA Design Code	B	KVA Code	M	Starting Current	9.4 A
Service Factor (S.F.)	1.25			No-load Current	0.743 A
NEMA Nom. Eff.	84	Power Factor	73	Line-line Res. @ 25ºC	22.3 Ω
Rating - Duty	40C AMB-CONT			Temp. Rise @ Rated Load	30°C
S.F. Amps	2.64/1.32			Temp. Rise @ S.F. Load	39°C
				Rotor inertia	0.0946 LB-FT2

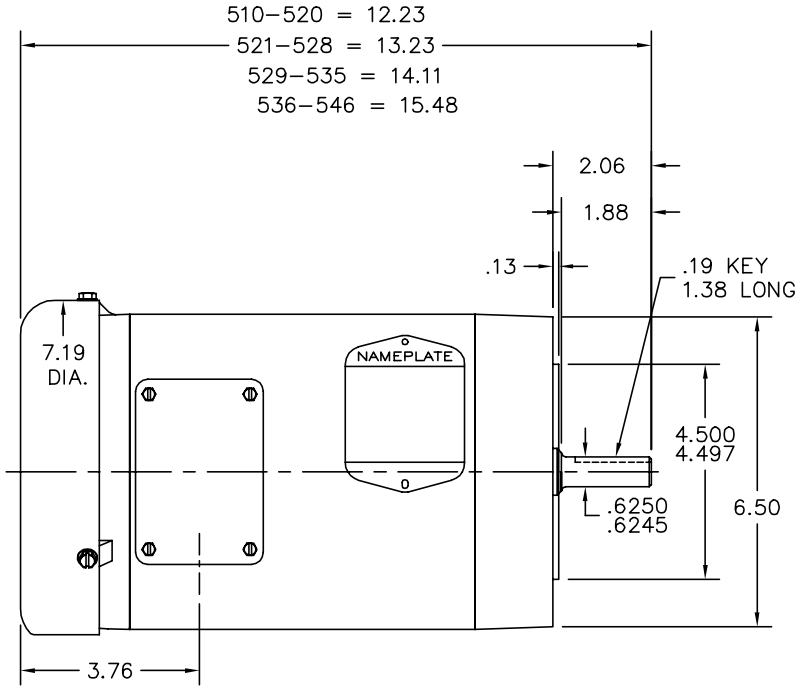
Load Characteristics 460 V, 60 Hz, 0.75 HP

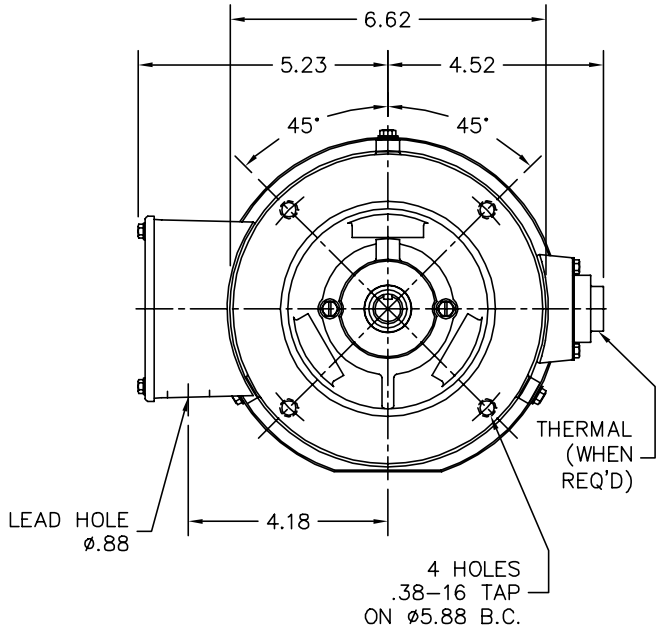
% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	32	49	63	72	79	84	80
Efficiency	69.5	80.4	83.8	84.4	84.1	82.1	84
Speed	1790	1777	1763	1750	1735	1717	1738
Line amperes	0.778	0.863	0.986	1.14	1.32	1.54	1.32

Performance Graph at 460V, 60Hz, 0.75HP Typical performance - Not guaranteed values



35LYJ302



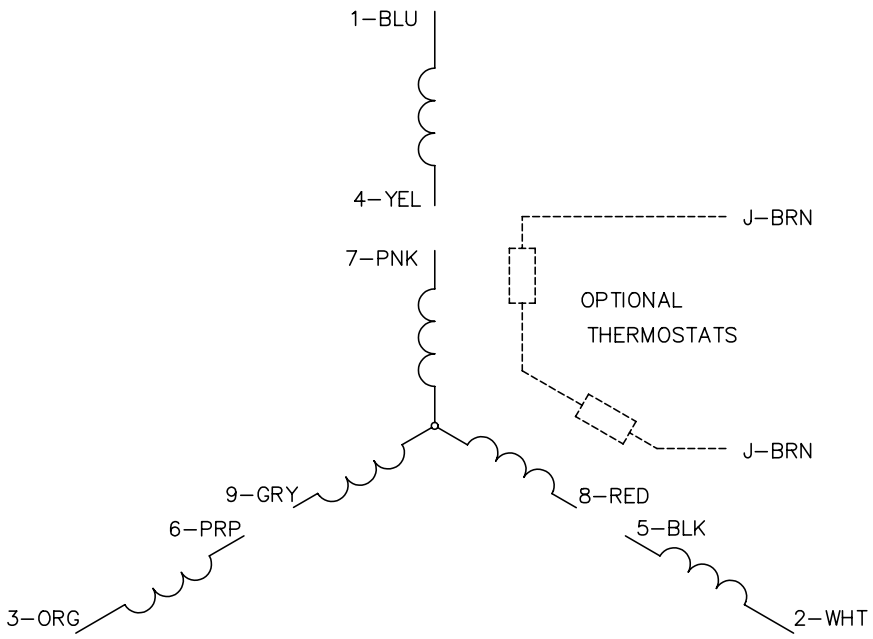


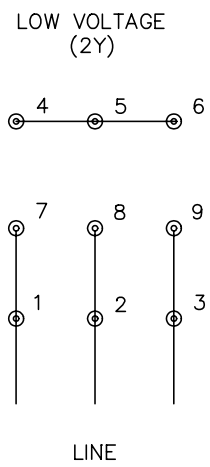
35LYJ302

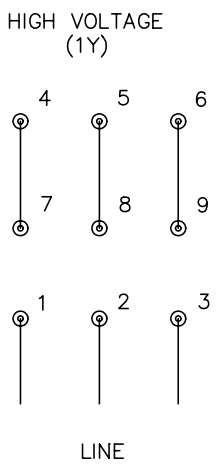
CUSTOMER IS RESPONSIBLE FOR DETERMINING THAT BALDOR'S PRODUCT WILL PERFORM SUITABLY IN THE INTENDED APPLICATION.

REV. DESC: UPDATE DRWG PARTS			BALDOR
REV. LTR: C	VERSION: 02	TDR: 000000738205	
FILE: \AAA\00041\631		REVISED: 02:09:50 03/15/2012	VERT 56C TEFC 35M SUPER–E
MTL: –		BY: ENBENBO	SH 1 of 1

CD0005







NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

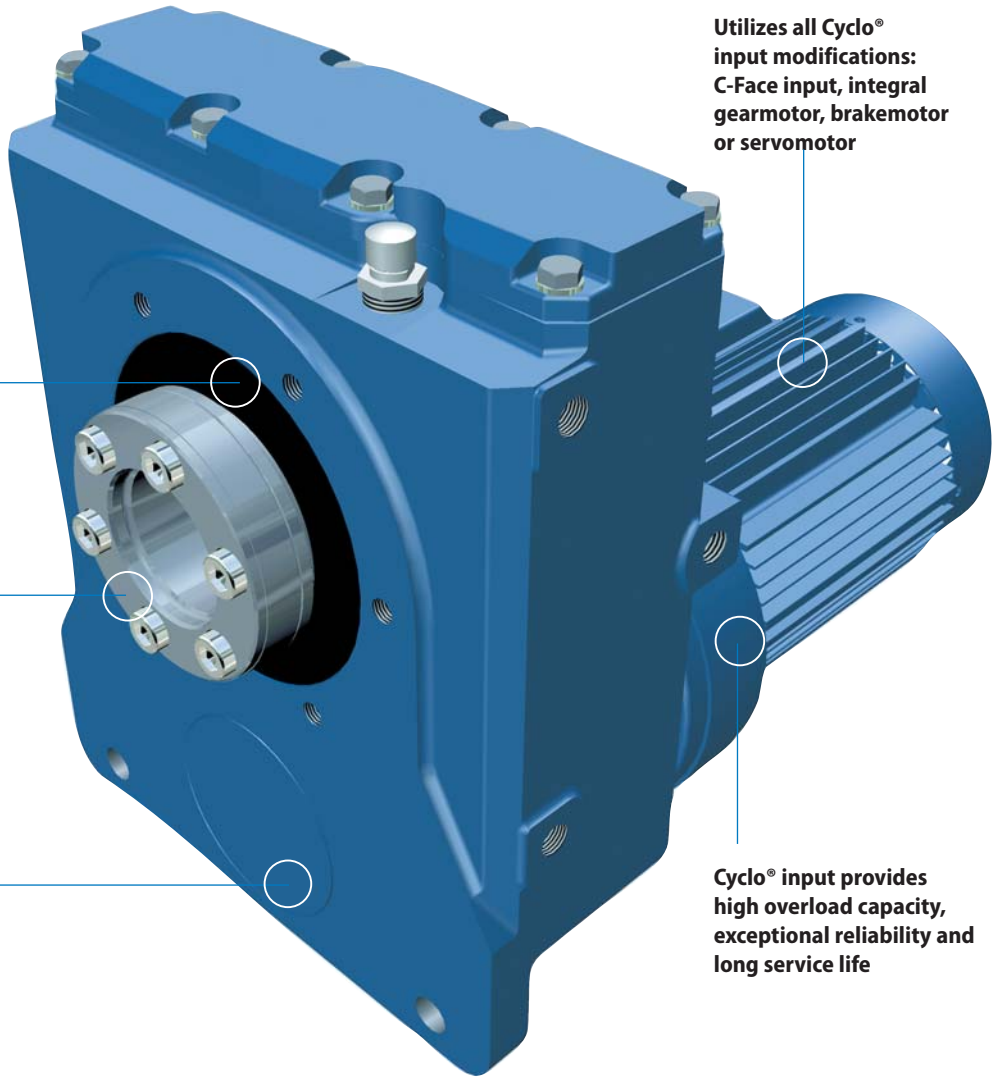
CD0005

REV. DESC: REVISE TO SHOW OPTIONAL COLORS			BALDOR ELECTRIC Co.
REV. LTR: E	BY: JLP	REVISED: 01/19/99 10:15	TDR: 0171435
CD0005		FILE: AAA00005140	MDL: –
		MTL: –	3PH, DV, 9 LEADS

Brush Drive Reducer Data

Flexible configurations

- Shaft Options:
  - hollow
- Mounting Options:
  - flange
  - face



Utilizes all Cyclo® input modifications: C-Face input, integral gearmotor, brakemotor or servomotor

Double output seals prevent lubricant leaks and protect from contamination

Patented keyless, steel Taper-Grip® bushing allows for quick and easy mounting and removal. Installs from either side

Patented universal housing design

Cyclo® input provides high overload capacity, exceptional reliability and long service life

Cyclo® Quality and Reliability, Shaft Mount Design

- High performance steel gearing components deliver **85-90% efficiency**

Product Description

Sumitomo's Cyclo® Helical Buddybox (Cyclo® HBB) speed reducers and gearmotors provide **innovative shaft mounted drive solutions for demanding services.** The Cyclo® HBB combines the quiet, efficient and reliable performance of the Cyclo® technology input with the **rugged helical gear output**. The **modular design** provides a compact, efficient product and the most flexible range of output speed and torque combinations available. Sumitomo's patented Taper Grip® bushing system enhances the Cyclo® HBB value by offering a simple shaft-mounting device that provides **self-aligning, backlash-free torque transmission** to the driven shaft. The Cyclo® HBB design is flexible and easily adapts to CEMA Screw Conveyor Drive applications with a modular conversion kit.

Features & Benefits

- **Cycloidal speed reduction technology**
  - ~ Quiet, efficient and reliable operation with high torque density and compact size
- **Modular design**
  - ~ Interchangeable cast iron housings in foot, flanged or face mount configurations
- **Double output seals**
  - ~ Virtually leak-free operation and optimal protection from lubrication contamination
- **Taper Grip® Bushing**
  - ~ Simple, steel, keyless shaft mounting system resists fretting and eases unit installation and removal from driven shaft
- **CEMA Screw Conveyor Drive option**
  - ~ Quick and simple conversion for Cyclo® HBB units to fit CEMA standard dimensions

Specifications

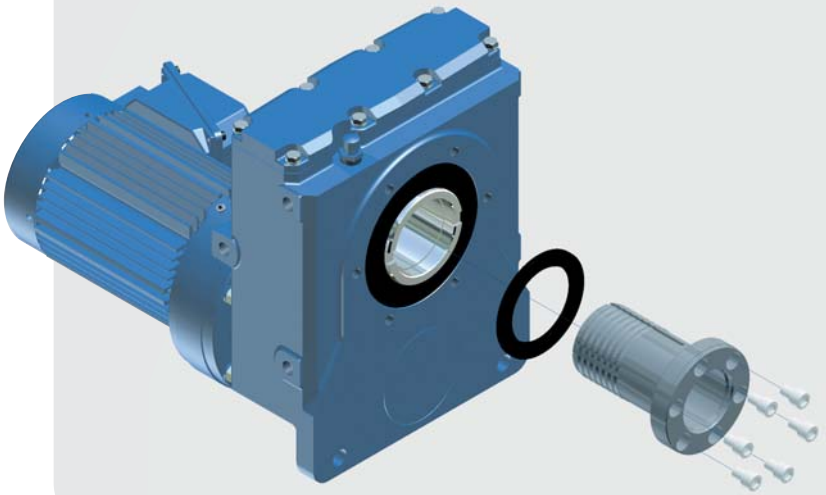
Ratios:	11:1 up to 26,000:1 and greater
Torque Capacity:	Up to 75,800 in. lbs.
HP:	1/8 to 40
Mounting:	Hollow Shaft, Flange, Face
Options:	Integral Motor, C-Face
Motor Standards:	NEMA, IEC, JIS, UL, CSA, CE

Keyless, steel Taper-Grip® bushing makes mounting of hollow shaft units easy and economical

The Sumitomo **Taper-Grip®** bushing is a keyless, torque transmission device integrated into the shaft mounted, offset parallel Cyclo® HBB reducer and gearmotor product lines.

The **unique, patented design** has a number of benefits :

- Easy mounting and removal of the unit to and from the driven shaft
- Standard bore sizes require no shaft preparation such as a keyway, undercut, or keeper plate
- Backlash free torque transmission
- Works with standard shafting, no special tolerances required
- Automatic shaft center alignment
- Resistant to fretting and corrosion
- Multiple stock bore sizes for quick delivery.



Applications

- Material Handling
- Conveyors
- Baggage Handling
- Shredders
- Belt Filter Press
- Mixer/Blender
- Rolling Mill Table
- Screw Conveyors
- Elevators
- Hoist Drives
- Climber Screens
- Food Processing

Standard Specifications

		Standard Specifications	Standard Specifications with Built-In Brake
~~3-Phase Integral Motor~~	~~Capacity Range:~~	~~1/8 HP ~ 40 HP, 4P~~	~~1/8 HP ~ 15 HP, 4P: FB Brake~~ ~~20 HP, 4P: CMB Brake~~ ~~25 HP ~ 40 HP, 4P: ESB Brake~~
	~~Enclosure:~~	~~Totally enclosed fan cooled type~~ ~~(1/8 HP, 4P Totally enclosed non ventilated)~~	~~Totally enclosed fan cooled type~~ ~~(1/8 HP, 4P Totally enclosed non ventilated)~~
	~~Power Supply:~~	~~230/460 Volts, 60 Hz~~ ~~575 Volts, 60 Hz~~	~~230/460 Volts, 60 Hz~~ ~~575 Volts, 60 Hz~~
	~~Insulation:~~	~~1/8 ~ 30 HP: Class B~~ ~~40 HP: Class F~~	~~1/8 ~ 20 HP: Class B~~
	~~Time Rating~~	~~Continuous~~	~~Continuous~~

Reducer	**Reduction:**	Combination of Cyclo input and helical gear output.
	Lubrication:	Cyclo portion is grease or oil lubricated; helical portion is oil lubricated.
	Seals:	Nitrile material, dual lipped, double output seals.
	Material:	Rugged cast iron housings
	Paint Color:	~~Blue, Muenters color number 6.5PB 3.6/8.2~~ STEEL-IT WASHDOWN DUTY SST COATING
	Bearings:	Ball bearings on geared output; ball bearings on Cyclo input. Tapered roller bearings optional.
Ambient Conditions	**Installation Location:**	~~Indoors (Minimal dust and humidity)~~ INDOOR / OUTDOOR
	Ambient Temperature:	14°~104° F (-10° ~ 40° C)
	Ambient Humidity:	Under 85%
	Elevation:	Under 3,281 ft. (1000 meters)
	Atmosphere:	Well ventilated location, free of corrosive gases, explosive gases, vapors and dust.

NOTE: WASHDOWN DUTY MODIFICATIONS PROVIDED ON GEAR REDUCERS

Shaft Rotation

On single reduction Cyclo HBB speed reducers, ratios 11 through 417, the slow speed shaft rotates in a reverse direction to that of the high speed shaft.

On double reduction units, ratios 364 through 26,492, both the high speed and the slow speed shaft rotate in the same direction.

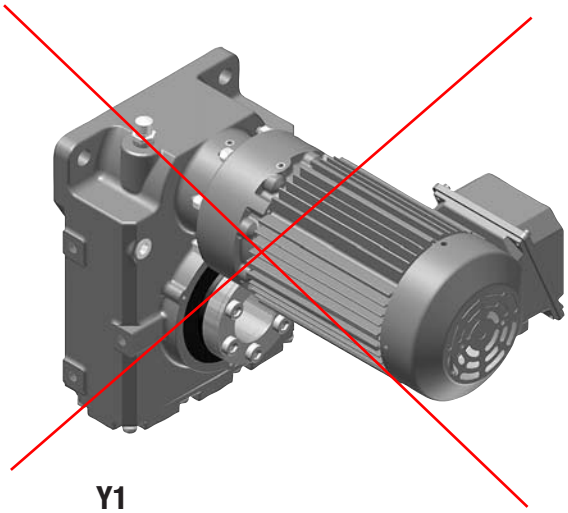
Input Speeds

The standard input speeds of single reduction units are 1750 and 1165 RPM.
When non-standard input speeds are used, the horsepower and torque ratings will also vary.

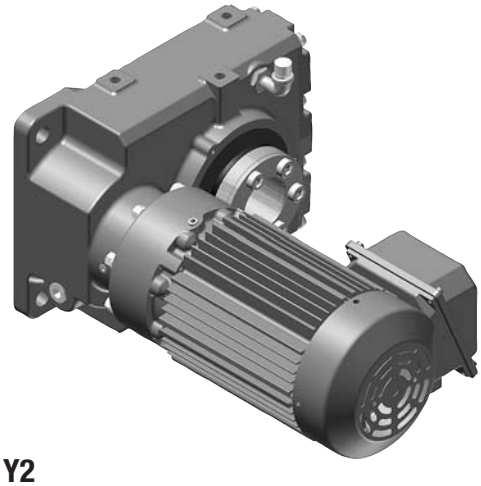
Thermal Capacity

The Cyclo HBB speed reducer's smooth, almost frictionless operation all but eliminates the conventional limitations due to heat. In all sizes, Helical Buddybox speed reducers have thermal ratings that exceed their mechanical capacity.

Mounting Positions

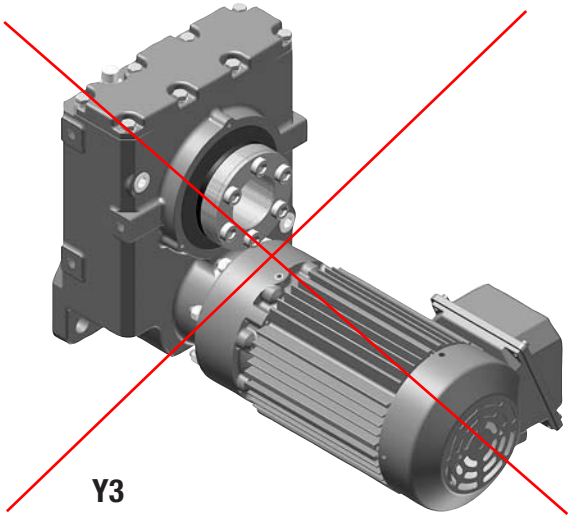


Y1

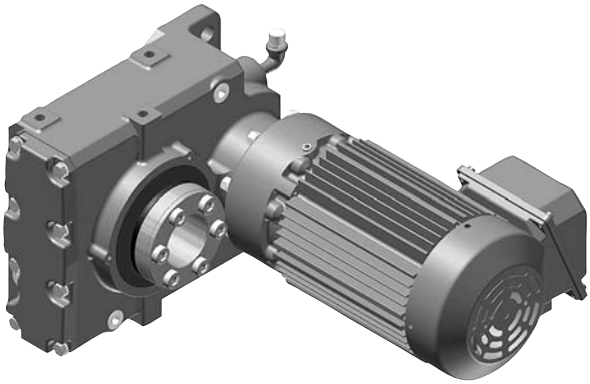


Y2

3007-313 LEFT HAND DRIVE
MODEL: EHYJS-A6100-Y-Y2-21-145TC

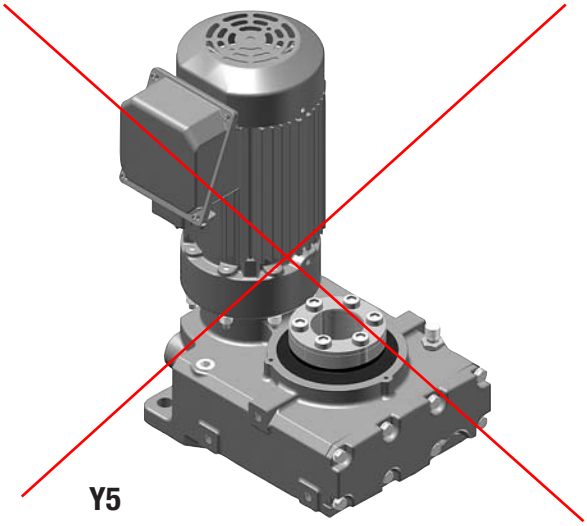


Y3

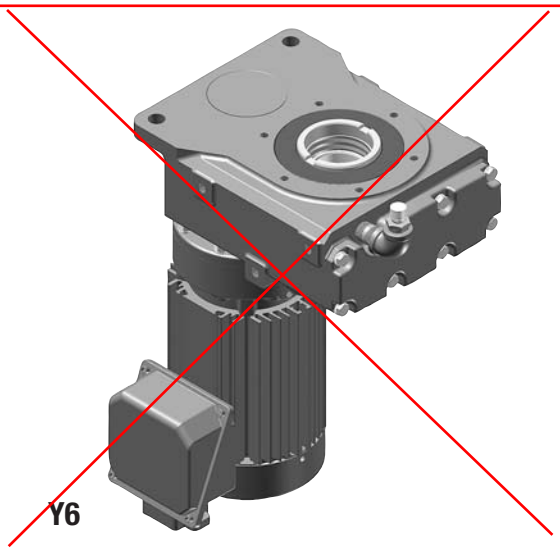


Y4

3007-312 RIGHT HAND DRIVE
MODEL: EHYJS-A6100-Y-Y4-21-145TC



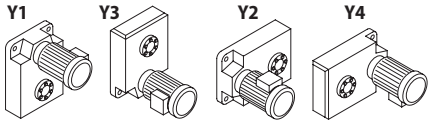
Y5



Y6

Frame Size Selection Tables 60 Hz, 1750 RPM

Single Reduction
Y1, Y3, Y2, Y4 Mounting Positions



Dimensions on pages 2.14–2.17

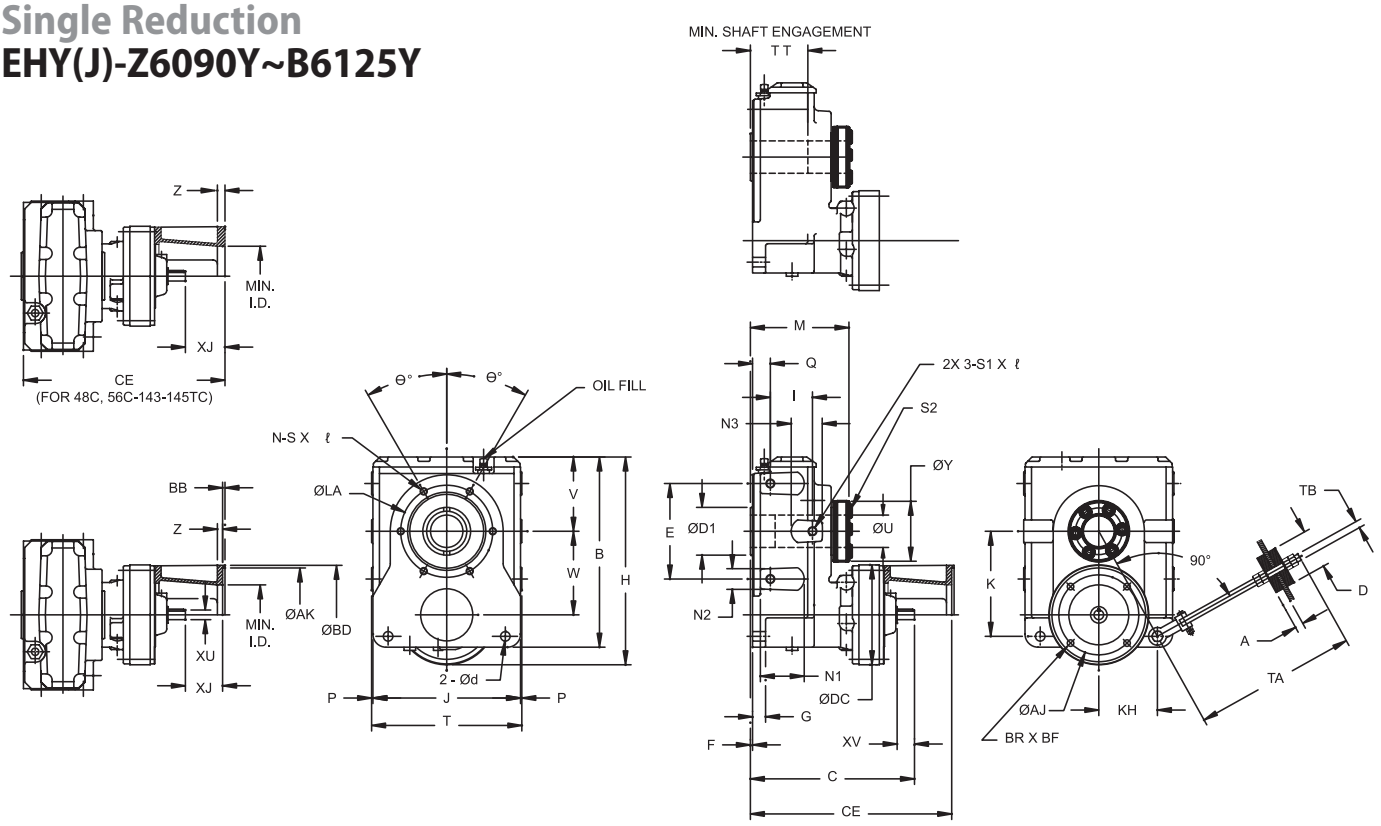
Output RPM	167	100	83.3	62.5	45.5	38.5	33.3	29.4	23.8	Frame Size
Ratio	11	18	21	28	39	46	53	60	74	
Input HP	–	–	1.54	1.54	1.54	1.54	1.54	1.54	1.02	**Z6090**
Output Torque in-lbs	–	–	1080	1430	1970	2330	2690	3050	2480	
Input HP	–	–	2.04	2.04	2.04	2.04	2.04	1.96	1.58	**Z6095**
Output Torque in-lbs	–	–	1420	1900	2610	3080	3550	3870	3870	
Input HP	3.15	3.15	3.15	3.15	3.15	3.15	3.15	2.67	2.59	**A6100**
Output Torque in-lbs	1100	1830	2200	2930	4030	4760	5490	5270	6320	
Input HP	4.26	4.26	4.26	4.26	4.26	4.26	4.26	3.30	3.14	**A6105**
Output Torque in-lbs	1490	2480	2970	3960	5450	6440	7430	6520	7660	
Input HP	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.80	5.31	**B6120**
Output Torque in-lbs	2370	3950	4740	6320	8690	10300	11900	13400	13000	
Input HP	7.79	7.79	7.79	9.32	7.94	7.94	7.94	7.59	6.42	**B6125**
Output Torque in-lbs	2720	4530	5430	8670	10100	12000	13800	15000	15700	
Input HP	17.4	17.4	17.4	17.4	17.4	17.4	16.1	13.5	11.6	**C6140**
Output Torque in-lbs	6080	10100	12200	16200	22300	26300	28100	26800	28300	
Input HP	20.2	20.2	20.2	20.2	20.2	20.2	18.0	15.9	12.8	**C6145**
Output Torque in-lbs	7060	11800	14100	18800	25900	30600	31300	31300	31300	
Input HP	27.2	27.2	27.2	26.4	26.4	26.4	25.1	17.6	17.3	**D6160**
Output Torque in-lbs	9490	15800	19000	24600	33800	39900	43700	34700	42200	
Input HP	32.3	32.3	32.3	32.3	32.3	30.3	30.3	25.2	21.6	**D6165**
Output Torque in-lbs	11300	18800	22500	30000	41300	45800	52800	49800	52700	
Input HP	37.0	37.0	37.0	37.0	37.0	36.6	34.2	26.4	26.1	**E6170**
Output Torque in-lbs	12900	21500	25800	34400	47300	55300	59600	52200	63800	
Input HP	40.3	40.3	40.3	40.3	40.3	40.3	40.3	32.3	31.1	**E6175**
Output Torque in-lbs	14100	23500	28100	37500	51600	61000	70400	63900	75800	

FOR AN A6100 GEAR REDUCER WITH A 21:1 SPEED RATIO:

MOTOR INPUT (HP) (1750 RPM SYNCHRONOUS SPEED)	OUTPUT TORQUE (IN-LB)	SERVICE FACTOR
3/4	530	4.15
1	700	3.14
1 1/2	1,050	2.10
2	1,400	1.57
3	2,100	1.05
3.15	2,200	1.00

Dimensions

Single Reduction
EHY(J)-Z6090Y~B6125Y



All dimensions are in inches.

Model	NEMA C-Face	B	C	E	F	G	H	I	J	K	M	P	Q	T	TT	ØU Max (Std)	ØU Min
~~Z6090~~ ~~Z6095~~	~~42C~~ ~~48C~~ ~~56C~~~145TC	~~11.02~~	~~9.09~~	~~5.51~~	~~0.20~~	~~0.79~~	~~11.87~~ ~~11.87~~ ~~12.26~~[1]	~~2.20~~	~~8.30~~	~~6.18~~	~~6.06~~	~~0.12~~	~~1.06~~	~~8.54~~	~~3.96~~	~~1 7/16~~	~~1 3/16~~
A6100 A6105	~~48C~~ 56C~145TC ~~182~184TC~~	11.83	9.92	5.91	0.20	0.79	~~12.70~~ 13.09[1] ~~14.23~~[1]	2.60	9.17	6.44	6.61	0.12	1.14	9.41	4.57	1-15/16"	~~2 3/16~~ ~~1 11/16~~
~~B6120~~ ~~B6125~~	~~56C~145TC~~ ~~182~184TC~~ ~~213~215TC~~	~~14.47~~	~~12.05~~	~~7.48~~	~~0.20~~	~~0.98~~	~~16.10~~ ~~16.57~~[1] ~~16.57~~[1]	~~3.39~~	~~11.41~~	~~7.97~~	~~7.64~~	~~0.12~~	~~1.22~~	~~11.65~~	~~5.43~~	~~2 7/16~~	~~1 15/16~~

Model	NEMA C-Face	V	W	ØY	Ød	ØD1	ØDC	KH	N1	N2	N3	S2	TA	A	D	TB
~~Z6090~~ ~~Z6095~~	~~42C~~ ~~48C~~ ~~56C~~~145TC	~~4.25~~	~~4.69~~	~~3.23~~	~~0.55~~	~~2.56~~	~~5.91~~	~~3.54~~	~~1.02~~	~~1.02~~	~~N/A~~	~~M10~~	~~17.50~~	~~0.63~~	~~2.36~~	~~M20~~
A6100 A6105	~~48C~~ 56C~145TC ~~182~184TC~~	4.61	5.14	4.09	0.71	3.35	5.91	3.74	1.10	1.10	N/A	M12	17.50	0.63	2.36	M20
~~B6120~~ ~~B6125~~	~~56C~145TC~~ ~~182~184TC~~ ~~213~215TC~~	~~5.71~~	~~6.40~~	~~4.49~~	~~0.71~~	~~3.94~~	~~8.03~~	~~4.33~~	~~1.34~~	~~1.26~~	~~N/A~~	~~M12~~	~~17.87~~	~~0.63~~	~~2.36~~	~~M20~~

Note: **[1]** Dimension is to **C**, motor mounting flange.

Dimensions

Single Reduction
EHY(J)-Z6090Y~B6125Y (cont.)

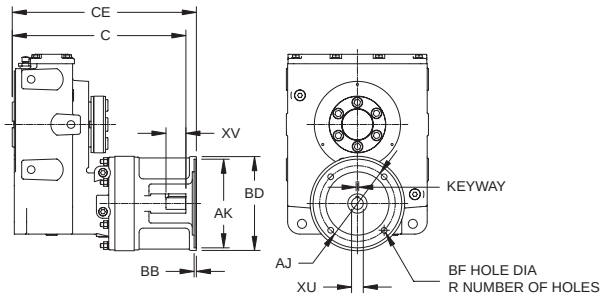
All dimensions are in inches.

Model	NEMA C-Face	ØLA	Θ °	N	S x ℓ	S1 x ℓ	XU	XV	Key	Unit Weight (lb)
Z6090 Z6095	42C 48C 56C~145TC	4.72	0	4	M10x0.79	M10x0.79	0.625	0.98	3/16 x 3/16 x .75	66
A6100 A6105	48C 56C~145TC 182~184TC	6.10	30	6	M12x0.79	M12x0.87	0.625	0.98	3/16 x 3/16 x .75	80
B6120 B6125	56C~145TC 182~184TC 213~215TC	6.89	30	6	M12x0.87	M16x1.02	0.75	1.38	3/16 x 3/16 x .1.02	148

Model	NEMA C-Face	C-Face Dimensions										Unit + C-Face Weight (lb)
		ØAJ	ØAK	ØBD	BB	BF	BR	CE	XJ	Z	Min. ID	
Z6090 Z6095	42C	3.75	3.00	4.33	0.00	0.28	4	10.88	1.79	0.47	2.44	71
	48C	3.75	3.00	4.33	0.00	0.28	4	11.25	2.16	0.47	2.44	72
	56C~145TC	5.88	4.50	6.69	0.00	0.43	4	11.72	2.63	0.47	4.21	74
A6100 A6105	48C	3.75	3.00	4.33	0.00	0.28	4	12.08	2.16	0.47	2.44	85
	56C~145TC	5.88	4.50	6.69	0.00	0.43	4	12.55	2.63	0.47	4.21	87
	182~184TC	7.25	8.50	8.98	0.22	0.55	4	13.34	3.42	0.69	5.43	91
B6120 B6125	56C~145TC	5.88	4.50	6.69	0.00	0.43	4	14.68	2.63	0.47	4.21	158
	182~184TC	7.25	8.50	8.98	0.22	0.55	4	15.39	3.34	0.47	5.43	161
	213~215TC	7.25	8.50	8.98	0.22	0.55	4	16.04	4.30	1.47	5.43	170

Options

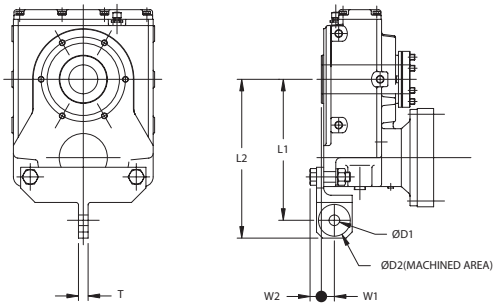
Hollow Input



All dimensions are in inches.

Model	NEMA C-FACE ADAPTOR	AJ	AK	BB	BD	BF	C	CE	R	XU		XV	Keyway
Z6090/5Y	56C	5.875	4.50	0.20	6.69	0.43	9.06	10.08	4	0.625	+0.0007 -0.0000	1.18	3/16 x 3/32
	143TC-145TC	5.875	4.50	0.20	6.69	0.43	9.45	10.08	4	0.875	+0.0008 -0.0000	1.57	3/16 x 3/32
A6100/5Y	56C	5.875	4.50	0.20	6.69	0.43	9.96	11.02	4	0.625	+0.0007 -0.0000	1.18	3/16 x 3/32
	143TC-145TC	5.875	4.50	0.20	6.69	0.43	10.43	11.02	4	0.875	+0.0008 -0.0000	1.65	3/16 x 3/32
B6120/5Y	56C	5.875	4.50	0.22	6.69	0.43	12.09	13.23	4	0.625	+0.0007 -0.0000	1.18	3/16 x 3/32
	143TC-145TC	5.875	4.50	0.22	6.69	0.43	12.28	13.23	4	0.875	+0.0016 -0.0008	1.50	3/16 x 3/32
	182TC-184TC	7.25	8.50	0.22	8.98	0.55	13.39	14.45	4	1.125	+0.0016 -0.0008	1.97	1/4 x 1/8
	213TC-215TC	7.25	8.50	0.22	8.98	0.55	13.50	14.45	4	1.375	+0.0020 -0.0010	2.64	5/16 x 5/32
C6140/5Y	143TC-145TC	5.875	4.50	0.20	6.69	0.43	15.20	15.75	4	0.875	+0.0008 -0.0000	1.61	3/16 x 3/32
	182TC-184TC	7.25	8.50	0.22	9.00	0.55	16.65	17.66	4	1.125	+0.0016 -0.0008	1.91	1/4 x 1/8
	213TC-215TC	7.25	8.50	0.22	9.00	0.55	16.30	17.66	4	1.375	+0.0020 -0.0010	2.68	5/16 x 5/32
	254TC-256TC	7.25	8.50	0.22	9.00	0.55	16.30	17.66	4	1.625	+0.0020 -0.0010	2.99	3/8 x 3/8
D6160/5Y	182TC-184TC	7.25	8.50	0.22	8.98	0.55	18.07	19.02	4	1.125	+0.0016 -0.0008	2.01	1/4 x 1/8
	213TC-215TC	7.25	8.50	0.22	8.98	0.55	18.07	19.02	4	1.375	+0.0020 -0.0010	2.48	5/16 x 5/32
	254TC-256TC	7.25	8.50	0.22	8.98	0.55	18.07	19.02	4	1.625	+0.0020 -0.0010	3.11	3/8 x 3/8
E6170/5Y	(Not Available in Hollow Input. See Pages 2.14 – 2.21 For C-face Dimensions.)												

"T" Type Torque Arm



All dimensions are in inches.

Model	L1	L2	W1	W2	T	D1	D2	Bolt Size
Z	8.94	9.92	0.71	0.59	0.47	0.55	1.70	M12
A	9.39	10.57	0.91	0.67	0.63	0.71	2.09	M16
B	11.52	12.97	1.06	0.75	0.79	0.87	2.60	M20
C	14.06	15.83	1.26	1.02	1.02	1.02	3.27	M24
D	17.05	18.82	1.57	1.18	1.18	1.02	3.27	M24
E	18.98	21.14	2.20	1.50	1.42	1.30	4.06	M30

Dimensions shown are for reference only and are subject to change without notice, unless certified.
Certified prints are available after receipt of an order; consult factory.

Taper Grip® Bushing Installation Guide

Introduction

The keyless Taper-Grip® bushing system provides simple and reliable shaft attachment for Sumitomo Speed reducers and gearmotors. This system allows bi-directional shaft rotation and stop-start operation with a powerful, slip-free grip. To assure peak performance of your equipment, please read, understand and follow these installation instructions.

Safety

Disconnect all power sources from the equipment before beginning this installation procedure. Handle the components with care and avoid all sharp or machined edges to prevent personal injury or damage to the components.

Before Installing Unit on Driven Shaft (Steps 1-5)

Carefully inspect the driven equipment shaft. Remove all burrs, corrosion, lubricants, and foreign matter from the shaft surface. Verify the shaft diameter is within the dimensional tolerances shown in Table 1.

Table 1 Driven Shaft Tolerances

Shaft Diameter (inches)	Shaft Tolerance (inches)
~~3/4" – 1-1/8"~~	~~+0" – 0.005"~~
1 3/16" – 2"	+0" – 0.006"
~~2-1/16" – 3-1/8"~~	~~+0" – 0.007"~~
~~3-3/16" – 4-3/4"~~	~~+0" – 0.008"~~
~~4-13/16" – 6-1/2"~~	~~+0" – 0.009"~~

Clean all surfaces of the shaft, the bushing, the thrust collar and the unit bore with solvent to remove all grease and oil.

Step 1 – Remove the cap screws from the bushing. Lightly oil the threads of the cap screws and partially re-insert them into the threaded holes in the bushing flange. The ends of the cap screws should not extend beyond the rear face of the bushing flange.

Step 2 – Slide the thrust collar onto the Taper-Grip® bushing (see Fig. 2).

Step 3 – Apply a thin layer of anti-seize paste **to the male threads of the Taper-Grip® Bushing only** (see Fig.3). Ensure that anti-seize paste does not enter the Taper-Grip® Bushing bore. **Caution: Do not apply anti-seize paste to the female threads in the hub.**

Step 4 – Carefully thread the Taper-Grip® bushing into the hub of the speed reducer or gearmotor until the thrust collar solidly engages the unit hub surface and the bushing flange (see Fig. 4). **Caution: Do not cross-thread. Bushing should thread easily into hub.**

Step 5 – Unscrew the Taper-Grip® bushing to create a 1mm (0.04") gap between the thrust collar and the bushing flange.

Step 6 – Hand-tighten the cap screws until they firmly press the thrust collar against the unit hub surface. The unit is ready for installation on the driven shaft.

Fig. 1 Taper-Grip® Bushing Parts

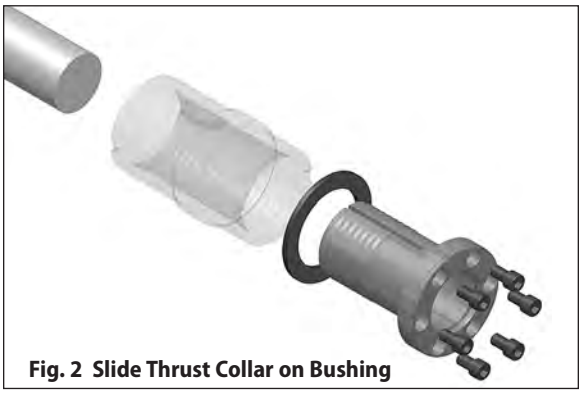


Fig. 2 Slide Thrust Collar on Bushing

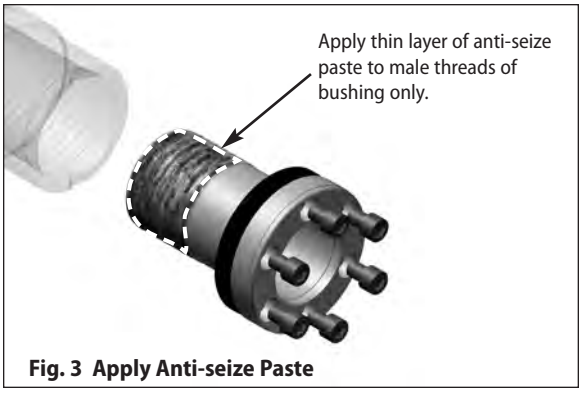


Fig. 3 Apply Anti-seize Paste

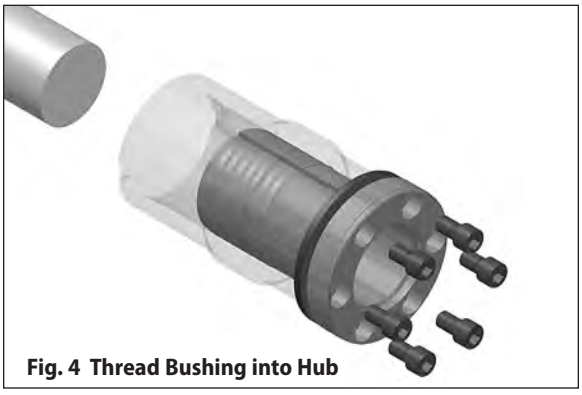


Fig. 4 Thread Bushing into Hub

Taper Grip® Bushing Installation Guide continued

Unit Installation

Step 7 – Position unit with the bushing flange located on the outboard side of the unit. Align the bushing with the driven shaft. Slide the unit onto the driven shaft as close to the driven shaft support bearing as possible. Ideally, the driven shaft should extend beyond the bushing flange face (see Fig. 6). Refer to Fig. 5 and Table 2 below for minimum shaft to bushing engagement.

Table 2 Minimum Shaft to Bushing Engagement

Minimum Shaft Engagement								
~~HSM~~			Cyclo® HBB			~~Cyclo® BBB~~		
~~Model~~	~~mm~~	~~in.~~	Model	mm	in.	~~Model~~	~~mm~~	~~in.~~
~~107C~~	~~119.5~~	~~4.70~~	~~Z~~	~~112.5~~	~~4.43~~	~~3A, 2A~~	~~208~~	~~8.19~~
~~115D~~	~~127.5~~	~~5.02~~	A	126	4.96	~~3B, 2B~~	~~242~~	~~9.53~~
~~203E~~	~~136~~	~~5.35~~	~~B~~	~~143~~	~~5.63~~	~~3C, 2C~~	~~279~~	~~10.98~~
~~207F~~	~~153~~	~~6.02~~	~~C~~	~~186~~	~~7.32~~	~~3D, 2D~~	~~326~~	~~12.83~~
~~215G~~	~~183~~	~~7.20~~	~~D~~	~~204~~	~~8.03~~	~~3E, 2E~~	~~359~~	~~14.13~~
~~307H~~	~~205~~	~~8.07~~	~~E~~	~~224~~	~~8.82~~			
~~315J~~	~~215~~	~~8.46~~						
~~407S~~	~~219~~	~~8.62~~						
~~415K~~	~~217~~	~~8.54~~						
~~507L~~	~~285~~	~~11.22~~						
~~608M~~	~~335~~	~~13.19~~						

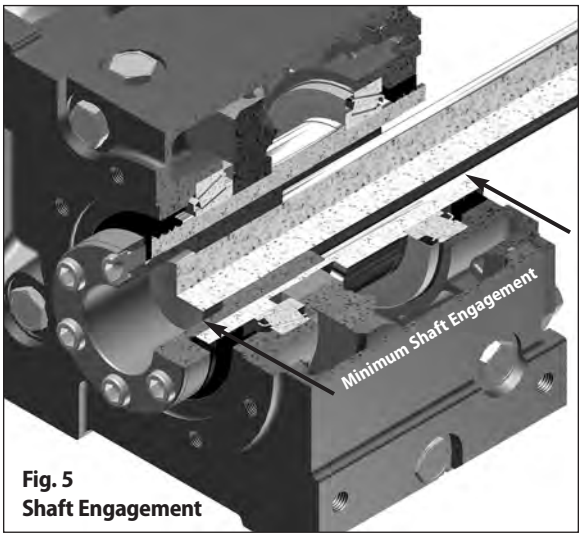


Fig. 5
Shaft Engagement

Step 8 – With a torque wrench, tighten the cap screws in 20% increments to engage the bushing system. Use the appropriate tightening pattern ("star-pattern" see Fig. 6) to assure complete bushing engagement. Tighten each cap screw to the torque values shown in Table 3.

Table 3 Cap Screw Tightening Torques

~~HSM Model~~	Cyclo® HBB Model	~~Cyclo® BBB Model~~	Cap screws (JIS Grade 12.9)		Cap screw Torque	
			Qty.	Size	Nm	Lb.Ft.
~~107C~~	~~Z~~		~~6~~	~~M10x14~~	~~50~~	~~37~~
~~115D~~			~~6~~	~~M10x14~~	~~55~~	~~41~~
~~203E~~	A	~~3A, 2A~~	6	M12x16	75	56
~~207F~~	~~B~~	~~3B, 2B~~	~~6~~	~~M12x16~~	~~140~~	~~104~~
~~215G~~	~~C~~	~~3C, 2C~~	~~6~~	~~M16x20~~	~~250~~	~~185~~
~~307H~~	~~D~~	~~3D, 2D~~	~~6~~	~~M16x20~~	~~250~~	~~185~~
~~315J~~	~~E~~	~~3E, 2E~~	~~8~~	~~M16x20~~	~~250~~	~~185~~
~~407S~~			~~10~~	~~M16x20~~	~~250~~	~~185~~
~~415K~~			~~10~~	~~M16x35~~	~~300~~	~~223~~
~~507L~~			~~12~~	~~M16x35~~	~~300~~	~~223~~
~~608M~~			~~16~~	~~M16x35~~	~~300~~	~~223~~

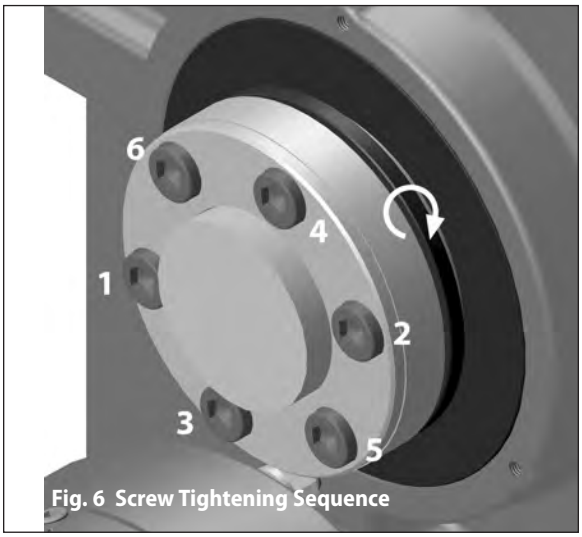


Fig. 6 Screw Tightening Sequence

If the shaft is recessed in the bushing, fill the void with grease to prevent corrosion and fouling.

Step 9 – Please read, understand and follow the instructions shown in the reducer/gearmotor installation and operating manual to complete the unit installation and attach the torque arm.

NOTE:

TO COMPLETE THE INSTALLATION, APPLY GREASE OR AN ANTI-CORROSION PASTE TO THE EXPOSED SHAFT ON BOTH ENDS OF THE GEAR REDUCER **AFTER** THE TAPER BUSHING IS INSTALLED AND THE BUSHING BOLTS ARE FULLY TIGHTENED. THEN, INSTALL THE BUSHING COVER.

Taper Grip® Bushing Installation Guide continued

Removal Procedure

Step 1 – Before removing the reducer/gearmotor from the driven shaft, externally support the unit so that all its weight is removed from the driven shaft (see Fig. 7). **Caution: Do not raise the unit too high. It may cause the shaft to bind.**

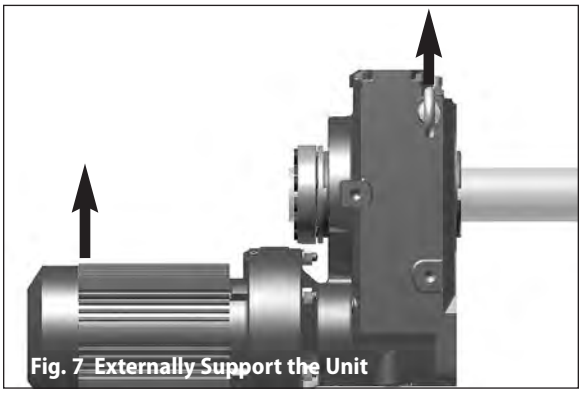


Fig. 7 Externally Support the Unit

Step 2 – Check the Taper-Grip® Bushing to assure that there is a gap between the thrust collar and the bushing flange. If no gap exists, unit removal may be difficult (see Fig. 8).

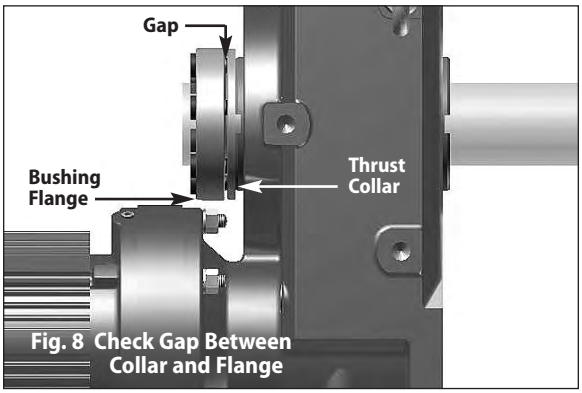


Fig. 8 Check Gap Between Collar and Flange

Step 3 – Spray a liquid penetrant onto each of the Taper-Grip® Bushing cap screws. Allow time for the penetrant to settle into the threads of the cap screws. (see Fig. 9).

Fig. 9 Spray Penetrant on Cap Screws

Step 4 – After the liquid penetrant has been allowed to settle, remove the cap screws one at a time (see Fig 10).

Fig. 10 Remove Cap Screws

Step 5 – Place a copper or brass bar against the flange of the Taper-Grip® Bushing and carefully strike end of bar with a hammer to release bushing (see Fig 11).

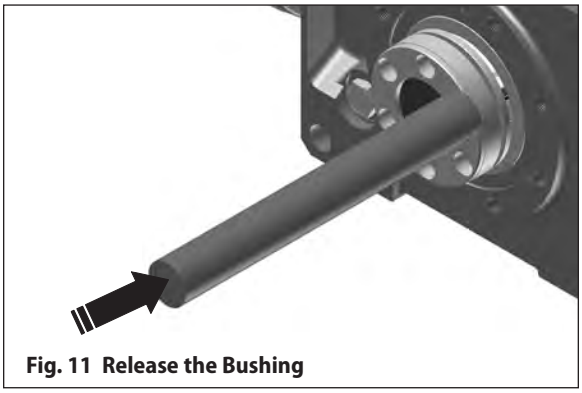


Fig. 11 Release the Bushing

Step 6 – After releasing the bushing, apply a liquid penetrant to the shaft where it contacts the bushing. Allow time for the liquid to penetrate between the bushing and the shaft, then carefully slide the unit off of the shaft. (see Fig 12). **Note: If the bushing releases, but the unit cannot be removed from the shaft, apply a puller to the bushing to push the shaft free.**

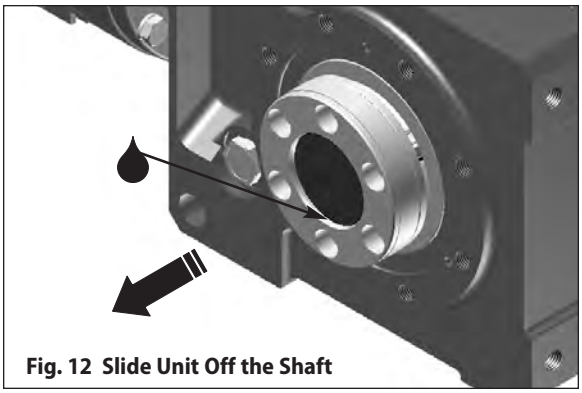
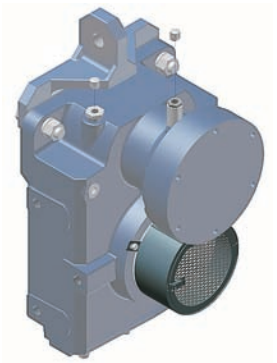


Fig. 12 Slide Unit Off the Shaft

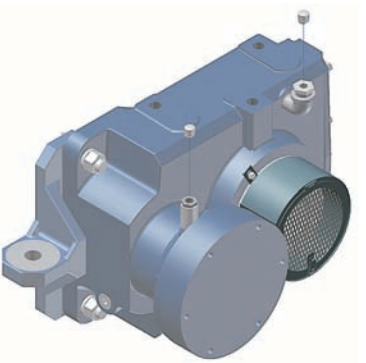
Air Vent Locations

- Ensure reducer is in the proper mounting position.
- Remove plugs and install air vents included in reducer package.
- An elbow is included for:
  - ~ the gear portion when mounting in the Y2 and Y4 position.
  - ~ the Cyclo® portion when mounting in the Y3 position.

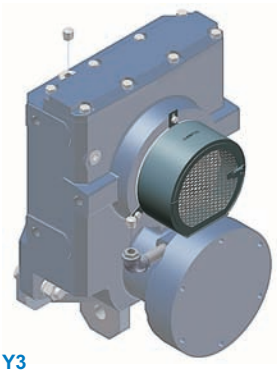
Important: Unit is filled with oil. Removing plugs before placing unit in correct mounting position will cause oil to spill.



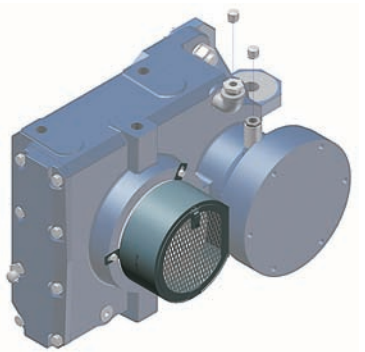
Y1



Y2



Y3



Y4

Parts List

General Construction
Helical Gear Output Section

Figure 5.7 Helical Gear Output Section

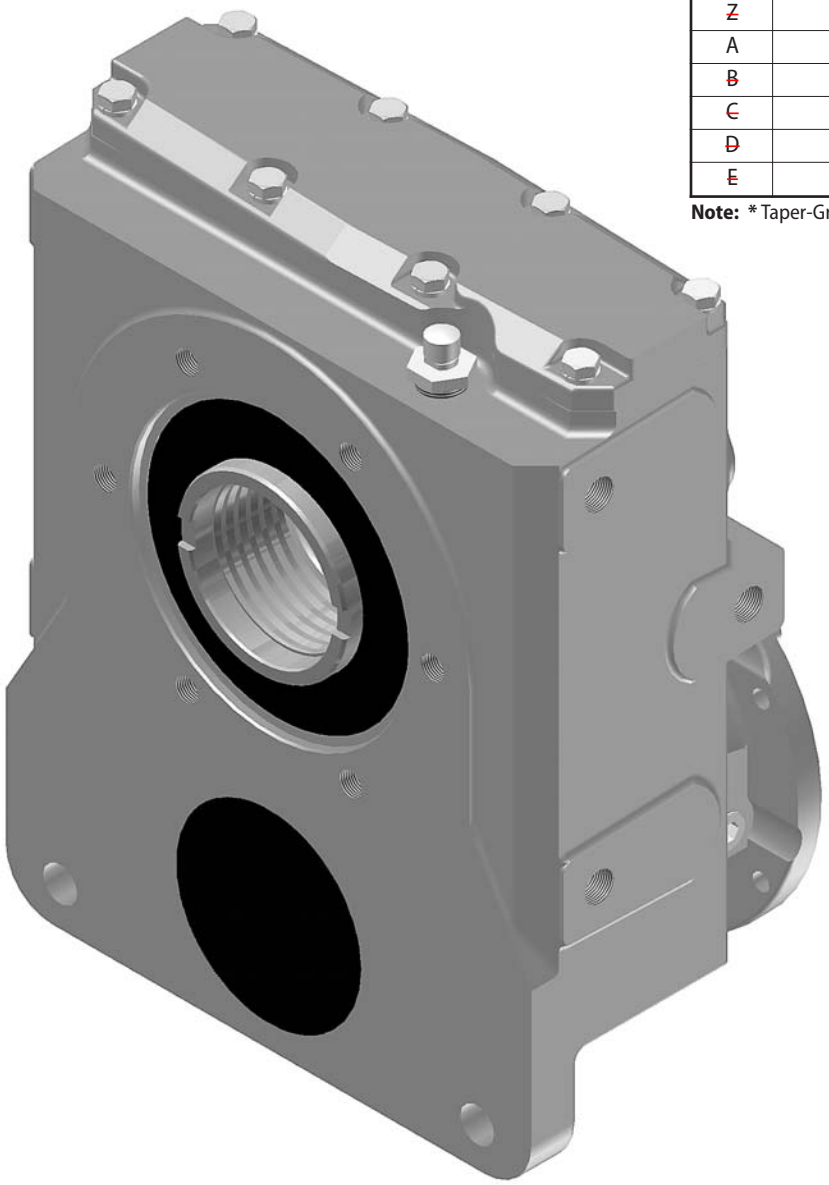


Table 5.13 Helical Gear Output Assembly Part Numbers

Unit Size	Output Assembly Part Number*
~~Z~~	~~037L0004~~
A	037A0004
~~B~~	~~037B0004~~
~~C~~	~~037C0004~~
~~D~~	~~037D0004~~
~~E~~	~~037E0004~~

Note: * Taper-Grip® Bushing not included.

Cyclo® Parts List

Cyclo® Reducer Input Section

Single Reduction

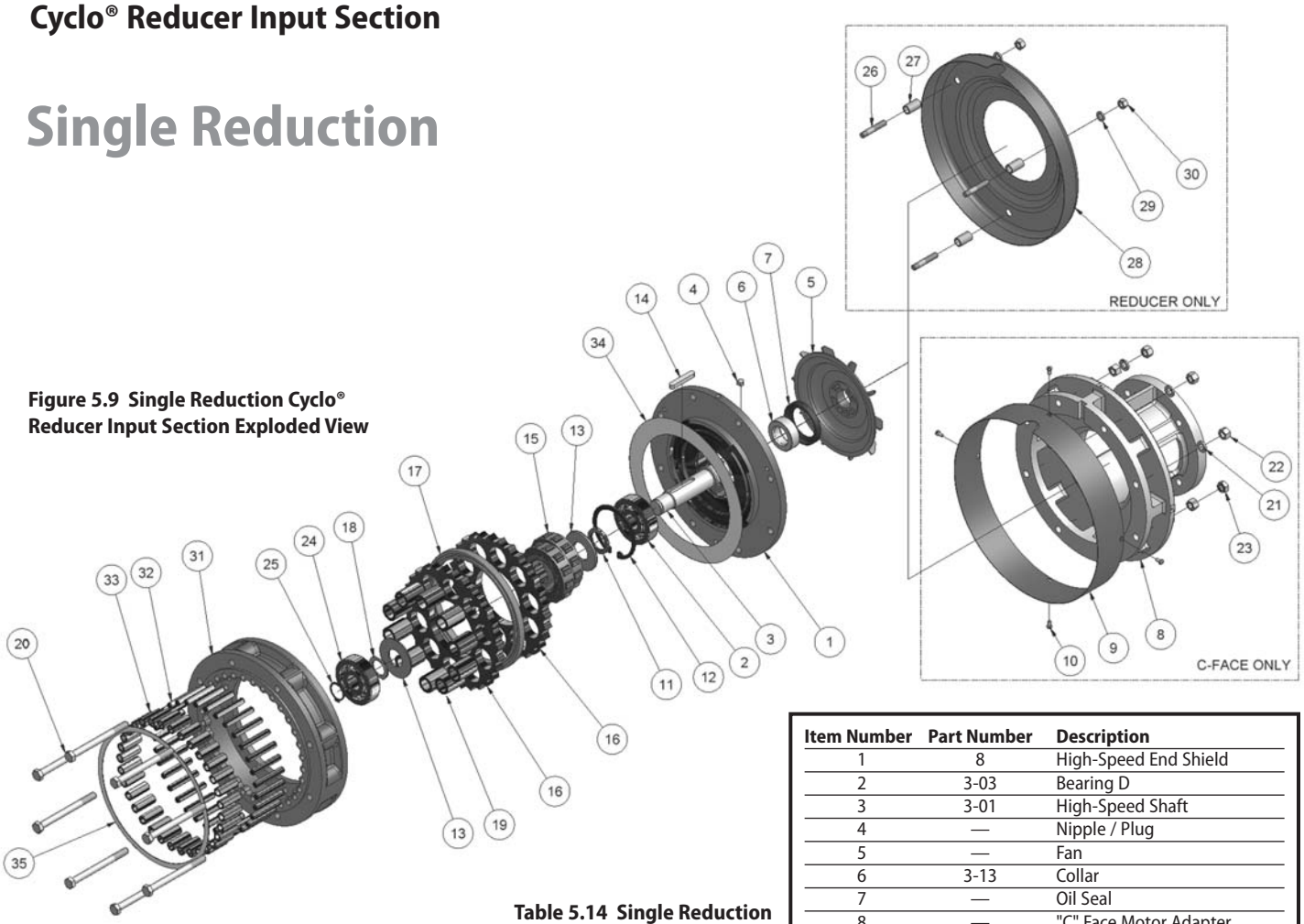


Figure 5.9 Single Reduction Cyclo® Reducer Input Section Exploded View

Table 5.14 Single Reduction Input Section Main Parts

Item Number	Part Number	Description
1	8	High-Speed End Shield
2	3-03	Bearing D
3	3-01	High-Speed Shaft
4	—	Nipple / Plug
5	—	Fan
6	3-13	Collar
7	—	Oil Seal
8	—	"C" Face Motor Adapter
9	—	Fan Shroud
10	—	Shroud Bolts/Screws
11	3-08	Spacer
12	3-11	Snap Ring
13	—	Endplate
14	3-05	Eccentric Key
15	3-04	Eccentric Cam Assembly
16	2-04	Cycloid Discs
17	2-05	Disc Spacer
18	3-09	Spacer
19	—	Slow Speed Shaft Rollers
20	—	Housing Bolts
21	—	Washers
22	—	Nuts
23	—	Locknut
24	3-02	Bearing C
25	3-10	Snap Ring
26	—	Tap-End Stud
27	—	Fan Spacer
28	—	Fan Cover
29	—	Washers
30	—	Nuts
31	2-01	Ring Gear Housing
32	2-02	Ring Gear Pins
33	2-03	Ring Gear Rollers
34	—	Gasket*
35	—	Gasket*
		*Supplied as a set only

Lubrication

Oil lubricated models are not filled with oil prior to shipping.

Before operating, fill the unit with the appropriate amount of the correct lubricant for the mounting position (see Table 5.27 and 5.29). When operating in winter or other relatively low ambient temperatures, use the lower viscosity oil specified for each ambient temperature range. Please consult the factory if the unit will be operated consistently in ambient temperatures other than 32°F–104°F.

Table 5.27 Standard Oils

Ambient Temperature (°F)	ChevronTexaco	Exxon Oil	Mobil Oil	Shell Oil	BP Oil
14 to 41°	EP Gear Compound 68	Spartan EP 68	Mobilgear 626 (ISO VG 68)	Omala Oil 68	Energol GR-XP 68
32 to 95° STANDARD	EP Gear Compound 100, 150	Spartan EP 100 EP 150	Mobilgear 627, 629 (ISO VG 100, 150)	Omala Oil 100, 150	Energol GR-XP 100 GR-XP 150
86 to 122°	EP Gear Compound 220, 320, 460	Spartan EP 220 EP 320 EP 460	Mobilgear 630, 632 633, 634 (ISO VG 220–460)	Omala Oil 220, 320 460	Energol GR-XP 220 GR-XP 320 GR-XP 460

Grease lubricated models are lubricated with grease prior to shipment from the factory.

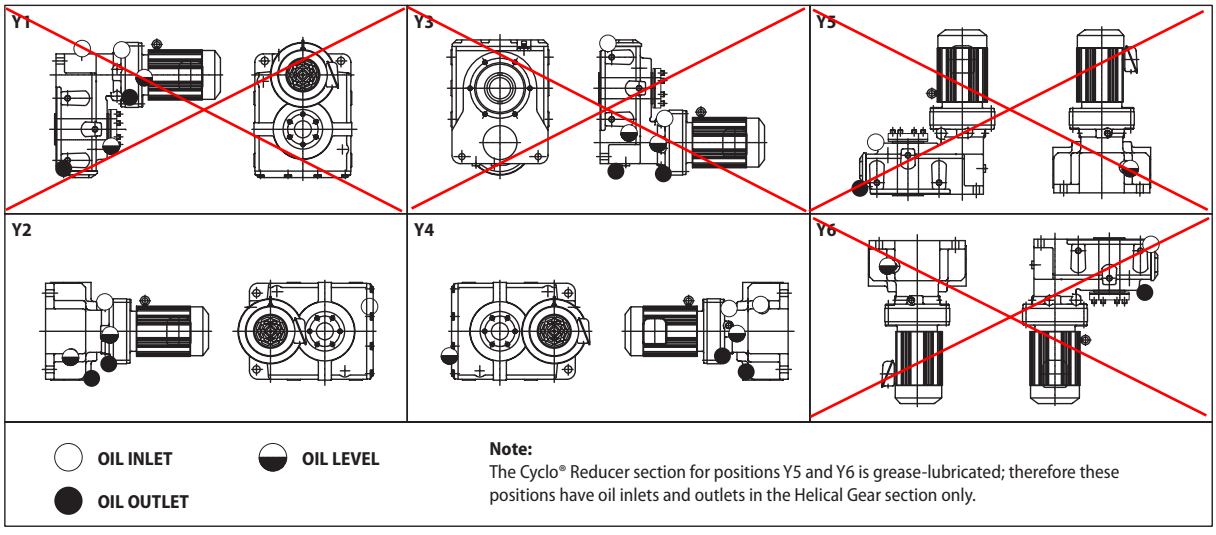
Adding grease prior to initial start-up is not required. If grease must be replenished or changed (see Grease Lubrication section), avoid using greases other than those shown in the Table 5.28. Please consult the factory when the units will be used in widely fluctuating temperatures, ambient temperatures other than those specified in Table 5.28, or when other special conditions exist for the application. When motors from another manufacturer will be used, please consult and adhere to the associated motor maintenance manual for the appropriate lubrication instructions.

Table 5.28 Standard Greases

Ambient Temperature (°F)	Reduction Ratio	Input (Cyclo Side)
14 to 122°	11, 18:1	Shell Alvania EP R0
	21:1 and higher	ExxonMobil Unirex N2 Grease

Figure 5.26

Oil Plug Locations



Note:
The Cyclo® Reducer section for positions Y5 and Y6 is grease-lubricated; therefore these positions have oil inlets and outlets in the Helical Gear section only.

Table 5.29 Oil Fill Quantities Unit: **U.S. Gallons** *G = Grease

Model	Y1		Y2		Y3		Y4		Y5		Y6	
	Output	Input*	Output	Input*	Output	Input*	Output	Input*	Output	Input*	Output	Input*
Z6090/95	0.16	G	0.16	G	0.13	G	0.16	G	0.29	G	0.26	G
A6100/05	0.21	G	0.24	G	0.18	G	0.24	G	0.40	G	0.37	G
B6120/25	0.26	G	0.40	G	0.26	G	0.40	G	0.53	G	0.48	G
C6140/45	0.45	0.11	0.55	0.11	0.34	0.11	0.55	0.11	1.24	G	0.92	G
D6160/65	0.71	0.18	0.92	0.18	0.53	0.18	0.92	0.18	1.85	G	1.45	G
E6170/75	0.92	0.24	1.11	0.24	0.66	0.24	1.11	0.24	2.38	G	1.85	G

Oil lubricated units are shipped without oil. Prior to initial start-up, the unit must be filled with the correct amount of oil (see Table 5.29). For those units where both the gear and Cyclo® portions are oil lubricated, the oil must be filled in two separate locations, one on the gear housing and one on the Cyclo® housing.

The geared (output) portion of all **double reduction units** is oil lubricated and must be filled by the customer with the correct amount of oil (see Table 5.29) prior to initial start-up.

Grease lubricated models are lubricated at the factory. Additional grease does not need to be added prior to initial start-up.

The Cyclo® (Input) portion of all **double reduction units** are grease lubricated at the factory. Additional grease does not need to be added prior to initial start-up.

Oil Replenishment and Change Interval

A. Maintain proper oil levels at all times.

B. An oil change after the first 500 hours of operation is highly recommended.

C. Sumitomo recommends an oil change every 2500 hours, or six months, whichever comes first. If a proper preventive maintenance program is implemented and maintained, a longer change period may be acceptable.

D. If the unit is running in a high ambient, high humidity, or corrosive environment, the lubricant will have to be changed more frequently. Consult the factory for recommendations.

E. Note: The Cyclo® portion and Helical portion, where applicable, must be filled with oil separately. Oil does not flow from one section to the other.

Grease Replenishment and Change Interval

A. On single reduction Cyclo® Helical Buddybox (Cyclo® HBB) sizes Z6090/95. A6100/05 and B6120/25, the Cyclo® portion is grease lubricated as standard and therefore maintenance free. Consult the operations and maintenance manual for the grease change interval.

B. When mounting Cyclo® HBB sizes C6140/45, D6160/65 and E6170/75 in the Y5 and Y6 positions, please consult the maintenance and operations manual for the proper grease replenishment and change interval for the Cyclo® portion.

Sumitomo Drive Technologies
Long Term Storage Instructions

I. Oil Lubricated:

A. 6 Months to One Year Storage
   1. Fill with rust preventative oil or circulating oil.
   2. At approximately three-month intervals, rotate the input shaft a sufficient number of times to insure all internal components remain coated.
      Note: The higher the ratio, the greater the amount needed for proper lubrication.
   3. To return unit to operation
      a. Completely drain the rust preventative, or circulating oil from the unit
      b. Flush unit with the recommended operating oil.
      c. After flushing, fill the unit to the proper oil level with the recommended lubricating oil.

B. One Year or Longer Storage
   1. Treatment by Sumitomo before shipment
      a. No-load running with a rust preventative oil NP-10, then the oil is drained.
      b. Next NP-20 rust preventative lubricant is sprayed on the inside housing after draining the rust preventative lubricant or circulating oil.
      c. The oil filler cap is covered with tape or a polyethylene bag.
   2. Long Term Storage by customer after prepared by Sumitomo
      a. After a period of one year and each year afterward, customer is required to fill the unit with Shell VSA Circulating oil 100 to the recommended oil level and re-cover the oil filler cap.
   3. To return unit to operation
      a. Drain the rust preventative or circulating oil.
         Note: No operation with the rust preventative or circulating oil is permitted.
      b. Flush twice with the recommended unit oil before putting into operation.
      c. Fill to the proper level with the recommended oil.

II. Grease Lubricated:

A. Within one year, no action is required before operation.
B. For operation after storage longer than one year, it is recommended that the unit be disassembled and the grease changed. For single reduction maintenance free units, test run the unit with the grease filler plug removed, discharge excess grease, and put the plug back in place.

Special Note: Non-metallic parts such as oil seals, oil gauges, and oil filler plugs can be adversely affected by ambient conditions such as temperature, weather, and ultraviolet rays. After storing the unit for an extended period, carefully inspect the unit before starting operation. Replace all parts that have been affected.

Brush Drive Motor Data

Severe Duty Super-E® ECP/XEX NEMA Premium® Efficient Motors

Baldor•Reliance Super-E, ECP motors have XEX designs that meet the demanding application requirements typically found in harsh processing environments. Features include cast iron construction, Oversized and rotatable cast iron conduit box, V-Ring shaft seal, Stainless steel nameplate and Corrosion resistant hardware and epoxy finish. Super-E electrical designs have 1.15 service factors and a Class F Insulation system that is Inverter Ready and meets NEMA MG 1 Part 31.4.4.2.

TEFC – Totally Enclosed Fan Cooled
Foot Mounted, 230/460 460 & 575 Volt, Three Phase, 1-400 Hp

Hp	kW	RPM	Frame	Catalog No.	Amps @ High V		F.L. Torque Lb. Ft.	Efficiency %			Power Factor %			Bearings		Volt Code	"C" Dim.	Conn. Diag. No.	Notes
					F.L.	L.R.		1/2	3/4	F.L.	1/2	3/4	F.L.	DE	ODE				
230/460 Volts																			
1	0.75	3450	143T	**ECP3580T**	1.4	12.1	1.5	80.6	84	84	65	77	83	6205	6205	E	12.88	CD0005	-
1	0.75	1765	143T	**ECP3581T**	1.5	15	3	84.4	87	87.5	48	60	70	6205	6205	E	12.88	CD0005	-
1	0.75	1150	145T	**ECP3582T**	1.8	9.6	4.5	82.3	84	82.5	42	55	63	6205	6205	E	12.88	CD0005	-
1 1/2	1.1	3450	143T	**ECP3583T**	2	20.1	2.3	81.3	84.3	85.5	68	78	83	6205	6205	E	12.88	CD0005	-
1 1/2	1.1	1760	145T	**ECP3584T**	2.1	18	4.5	86.8	88.4	88.5	54	67	76	6205	6205	E	12.88	CD0005	-
1 1/2	1.1	1170	182T	**ECP3667T**	2.5	16.2	6.8	84.8	86.9	87.5	44	56	64	6206	6206	E	15.93	CD0005	-
2	1.5	3450	145T	**ECP3586T**	2.5	30	3	83.8	86.2	86.5	70	80	85	6205	6205	E	12.88	CD0005	-
2	1.5	1755	145T	**ECP3587T**	2.8	25	6	86.9	88.5	88.5	54	67	75	6205	6205	E	12.88	CD0005	-
2	1.5	1165	184T	**ECP3664T**	3.2	20.9	9	96.9	88.5	88.5	48	60	68	6206	6206	F	15.93	CD0005	-
3	2.2	3500	182T	**ECP3660T**	3.4	32	4.5	87.5	89.1	88.5	83	89	92	6206	6206	E1	15.93	CD0005	-
3	2.2	1760	182T	**ECP3661T**	4.2	33	9	88.9	90.4	90.2	54	66	74	6206	6206	E1	15.93	CD0005	-
3	2.2	1165	213T	**ECP3764T**	4.5	30.9	13.5	89.5	90.4	90.2	52	64	70	6307	6307	E1	19.5	CD0005	-
5	3.7	3490	184T	**ECP3663T**	5.7	64.8	7.5	89.4	90.8	90.2	76	85	90	6206	6205	E1	15.93	CD0005	-
5	3.7	1750	184T	**ECP3665T**	6.6	54	14.9	90.3	91.2	89.5	60	73	80	6206	6206	E	15.93	CD0005	-
5	3.7	1160	215T	**ECP3768T**	7.3	51.9	22.8	90.3	91	90.2	54	65	72	6307	6307	E1	19.5	CD0005	-
7 1/2	5.6	3510	213T	**ECP3769T**	8.6	61.1	11.1	91.3	92.1	91.7	77	85	88	6307	6206	F	19.32	CD0005	-
7 1/2	5.6	1770	213T	**ECP3770T**	9.5	68	22.1	91.6	92.3	91.7	65	76	81	6307	6307	F	19.5	CD0005	-
7 1/2	5.6	1180	254T	**ECP2276T**	10.7	69.7	32.4	89.7	91.5	91.7	52	63	70	6309	6309	E1	24.69	CD0005	-
10	7.5	3500	215T	**ECP3771T**	11	120	15	92.7	92.9	92.4	82	89	92	6307	6307	F	19.5	CD0005	-
10	7.5	1760	215T	**ECP3774T**	12.5	88.5	29.8	92.9	93.1	92.4	67	78	82	6307	6307	F	19.5	CD0005	-
10	7.5	1180	256T	**ECP2332T**	14.2	93	44.4	90.2	91.6	91.7	55	66	72	6309	6309	E1	24.69	CD0180	-
15	11	3525	254T	**ECP2294T**	17.2	128	22.2	90.8	91.9	91.7	78	86	88	6309	6309	E1	24.69	CD0180	-
15	11	1765	254T	**ECP2333T**	18.5	122.9	44.6	91.9	92.6	92.4	66	77	82	6309	6309	E1	24.69	CD0005	-
15	11	1180	284T	**ECP4100T**	19.7	130.1	66.7	91.9	93	93	59	70	77	6311	6311	E1	27.93	CD0180	-
20	15	3540	256T	**ECP4106T**	22	165	29.8	91.5	92.2	92.4	83	91	92	6309	6309	E1	24.69	CD0180	-
20	15	1765	256T	**ECP2334T**	24	175	59	92.8	93.1	93	69	80	84	6309	6309	E1	24.69	CD0005	-
20	15	1180	286T	**ECP4102T**	26	171.6	89	92.5	93.3	93	61	72	78	6311	6311	F	27.93	CD0180	-
25	19	3510	284TS	**ECP4107T**	27	176	37.3	93.4	93.4	92.4	90	93	91	6309	6309	E1	24.66	CD0180	-
25	19	1770	284T	**ECP4103T**	30	186	74.2	92.3	93.5	93.6	73	81	85	6311	6311	E1	27.93	CD0005	-
25	19	1180	324T	**ECP4111T**	32	198	111	92.8	93.5	93	65	75	79	6312	6312	E1	30.27	CD0180	-
30	22	3520	286TS	**ECP4108T**	33	215	44.5	93.2	93.6	93	83	88	90	6311	6311	F	26.56	CD0180	-
30	22	1770	286T	**ECP4104T**	36	246	89	93.8	94.4	94.1	66	75	83	6311	6311	E1	27.93	CD0005	-
30	22	1180	326T	**ECP4117T**	39	243	133	92.5	93.2	93	62	73	78	6312	6312	E1	30.27	CD0005	-
40	30	3540	324TS	**ECP4109T**	45	326	59.5	92.3	93.4	93.6	80	87	90	6312	6312	F	28.66	CD0180	-
40	30	1775	324T	**ECP4110T**	46	320	118	93.9	94.6	94.5	73	81	84	6312	6312	E1	30.27	CD0180	-
40	30	1190	364T	**ECP4306T**	49.4	290	177	93.6	94.3	94.1	69	77	81	6313	6313	F	33.44	416820-2	-
50	37	3540	326TS	**ECP4114T**	56	403	74.1	94	94.5	94.1	80	87	89	6312	6312	E1	28.66	CD0180	-
50	37	1775	326T	**ECP4115T**	57	392	149	94.4	94.9	94.5	73	82	85	6312	6312	E1	30.27	CD0180	-
50	37	1185	365T	**ECP4312T**	61.7	345	221	93.9	94.4	94.1	70	78	81	6313	6313	F	33.44	416820-2	-
60	45	3560	364TS	**ECP4310T**	65.1	398	88.5	95.3	95.5	95	88	91	91	6313	6313	F	31.31	416820-2	-
60	45	1780	364T	**ECP4314T**	68	430	177	95.2	95.3	95	79	85	87	6313	6313	F	33.44	416820-2	-
60	45	1185	404T	**ECP4403T**	69	425	265	94.9	95.2	95	79	84	86	6316	6316	F	38.31	416820-2	-
75	56	3555	365TS	**ECP4313T**	80.7	494	111	95.1	95.4	95	91	92	92	6313	6313	F	31.31	416820-2	-
75	56	1780	365T	**ECP4316T**	85.9	542	221	95.7	95.8	95.4	77	84	86	6313	6313	F	33.44	416820-2	-
75	56	1185	405T	**ECP4404T**	86.9	541	332	95	95.3	95	73	82	85	6316	6316	F	38.31	416820-2	-
100	75	3565	405TS	**ECP4402T**	110	695	147	94.6	95.1	95	86	89	90	6313	6313	F	35.31	416820-2	-
125	93	3570	444TS	**ECP4412T**	138	820	184	93.9	94.7	95	83	87	86	6313	6313	F	40.98	416820-2	-
125	93	3570	444TS	**ECP4912T**	138	820	184	93.9	94.7	95	83	87	86	6313	6313	F	40.98	416820-2	99

NOTES: Volt Code: E = 208-230/460V, 60Hz; E1 = 230/460V, 60Hz, usable at 208V; F = 230/460V, 60 Hz Shaded ratings are cast iron frames.
99 = Has F3 lead outlet hole and an arm mounted conduit box for easy F1 or F2 lead location. See page 40 for Dimensions.
See page 49 for Connection Diagrams. See page 37 for Dimensions.
Efficiencies shown are nominal. Data subject to change without notice. Contact Baldor for certified data.

Severe Duty Super-E® ECP/XEX
C-Face Footless

NEMA Premium®

TEFC - Totally Enclosed Fan Cooled
230/460 Volts, Three Phase, 1 - 25 Hp

Hp	kW	RPM	Frame	Catalog No.	Amps @ High V		F.L. Torque Lb. Ft.	Efficiency %			Power Factor %			Bearings		Volt Code	"C" Dim.	Conn. Diag. No.
					F.L.	L.R.		1/2	3/4	F.L.	1/2	3/4	F.L.	DE	ODE			
1	0.75	3450	56C	**VECP3580-4**	1.4	12.1	1.5	80.5	83.6	84	65	77	84	6205	6205	G	14.5	CD0006
1	0.75	1765	56C	**VECP3581**	1.5	15	3	84.4	87	87.5	48	60	70	6205	6205	E	14.5	CD0005
1	0.75	1765	56C	**VECP3581-4**	1.5	15	3	84.4	87	87.5	48	60	70	6205	6205	G	14.5	CD0006
1	0.75	1765	143TC	**VECP3581T**	1.5	15	3	84.4	87	87.5	48	60	70	6205	6205	E	14.56	CD0005
1	0.75	1765	143TC	**VECP3581T-4**	1.5	15	3	84.4	87	87.5	49	60	70	6205	6205	G	14.57	CD0006
1	0.75	1150	145TC	**VECP3582T**	1.8	9.2	4.5	82.3	84	82.5	42	55	63	6205	6205	E	14.56	CD0005
1 1/2	1.1	3450	143TC	**VECP3583T-4**	2	20.1	2.3	81.3	84.3	85.5	68	78	83	6205	6205	G	14.57	CD0006
1 1/2	1.1	1760	145TC	**VECP3584T**	2.1	18	4.5	86.8	88.4	88.5	54	67	76	6205	6205	E	14.56	CD0005
1 1/2	1.1	1760	145TC	**VECP3584T-4**	2.1	18	4.5	86.5	88.3	88.5	54	67	76	6205	6205	G	14.56	CD0006
1 1/2	1.1	1170	182TC	**VECP3667T**	2.5	16.2	6.8	84.8	86.9	87.5	44	56	64	6206	6206	E	16.98	CD0005
2	1.5	3450	145TC	**VECP3586T-4**	2.5	30	3	83.8	86.2	86.5	70	80	85	6205	6205	G	14.56	CD0006
2	1.5	1755	145TC	**VECP3587T**	2.8	25	6	86.9	88.5	88.5	54	67	75	6205	6205	E	14.57	CD0005
2	1.5	1755	145TC	**VECP3587T-4**	2.8	25	6	86.9	88.5	88.5	54	67	75	6205	6205	G	14.57	CD0006
2	1.5	1165	184TC	**VECP3664T**	3.2	20.9	9	86.9	88.5	88.5	48	60	68	6206	6206	F	16.98	CD0005
3	2.2	3500	182TC	**VECP3660T-4**	3.4	34.5	4.5	87.5	89.1	88.5	83	89	92	6206	6206	G	16.98	CD0006
3	2.2	1760	182TC	**VECP3661T**	4.2	33	9	88.9	90.4	90.2	54	66	74	6206	6206	F	16.98	CD0005
3	2.2	1760	182TC	**VECP3661T-4**	4.1	31.9	9	89.2	90.4	90.2	56	67	75	6206	6206	G	16.98	CD0006
3	2.2	1165	213TC	**VECP3764T**	4.5	30.9	13.5	89.5	90.4	90.2	52	64	70	6307	6307	E1	21.41	CD0005
5	3.7	3500	184TC	**VECP3663T-4**	5.7	63.9	7.5	88.6	89.8	89.5	83	89	93	6206	6206	G	16.98	CD0006
5	3.7	1750	184TC	**VECP3665T**	6.6	54	14.9	90.3	91.2	89.5	60	73	80	6206	6206	E	16.98	CD0005
5	3.7	1750	184TC	**VECP3665T-4**	6.6	54	15	89.7	90.7	89.5	62	74	80	6206	6206	G	16.98	CD0006
5	3.7	1160	215TC	**VECP3768T**	7.3	51.9	22.8	90.3	91	90.2	54	65	72	6307	6307	E1	21.41	CD0005
7 1/2	5.6	3525	213TC	**VECP3769T-4**	8.6	86	11.2	90	91.4	91.7	79	87	90	6307	6307	G	21.41	CD0006
7 1/2	5.6	1770	213TC	**VECP3770T**	9.5	68	22.1	91.6	92.3	91.7	65	76	81	6307	6307	F	21.41	CD0005
7 1/2	5.6	1770	213TC	**VECP3770T-4**	9.5	68	22.1	91.6	92.3	91.7	65	76	81	6307	6307	G	21.41	CD0006
7 1/2	5.6	1180	254TC	**VECP2276T**	10.7	69.7	32.4	89.7	91.5	91.7	52	63	70	6309	6309	E1	27.69	CD0005
10	7.5	3500	215TC	**VECP3771T-4**	11	120	15	92.7	92.9	92.4	82	89	92	6307	6307	G	21.41	CD0006
10	7.5	1760	215TC	**VECP3774T**	12.5	88.5	29.8	92.9	93.1	92.4	67	78	82	6307	6307	F	21.41	CD0005
10	7.5	1760	215TC	**VECP3774T-4**	12.5	96.9	29.7	92.2	92.7	92.4	69	79	83	6307	6307	G	21.41	CD0006
10	7.5	1180	256TC	**VECP2332T**	14.2	93	44.4	90.2	91.6	91.7	55	66	72	6309	6309	E1	27.69	CD0180
15	11	1765	254TC	**VECP2333T**	18.5	122.9	44.6	91.9	92.6	92.4	66	77	82	6309	6309	E1	27.69	CD0005
15	11	1765	254TC	**VECP2333T-4**	18.5	122.9	44.6	91.9	92.6	92.4	66	77	82	6309	6309	G	27.69	CD0006
15	11	1180	284TC	**VECP4100T**	19.7	130.1	66.7	91.9	93	93	59	70	77	6311	6311	E1	30.68	CD0180
20	15	1765	256TC	**VECP2334T**	24	175.1	59.5	92.6	93.3	93	70	79	84	6309	6309	E1	27.69	CD0005
20	15	1765	256TC	**VECP2334T-4**	24	175	59	92.8	93.1	93	69	80	84	6309	6309	G	27.69	CD0006
20	15	1180	286TC	**VECP4102T**	26	171.6	89	92.5	93.3	93	61	72	78	6311	6311	F	30.68	CD0180
25	19	1770	284TC	**VECP4103T**	30	186	74.2	92.3	93.5	93.6	73	81	85	6311	6311	E1	30.68	CD0005
25	19	1180	324TC	**VECP4111T**	32	198	111	92.8	93.5	93	65	75	79	6312	6312	E1	32.91	CD0180

NOTES: Volt Code: E = 208-230/460V, 60Hz; E1 = 230/460V, 60Hz, usable at 208V; F = 230/460V, 60 Hz; G = 460V, 60Hz
See page 49 for Connection Diagrams. See page 39 for Dimensions.
Efficiencies shown are nominal. Data subject to change without notice.
Contact Baldor for certified data.

Shaded ratings are cast iron frames.

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Product Information Packet

VECP3584T

1.5HP,1760RPM,3PH,60HZ,145TC,0530M,TEFC

Part Detail							
Revision:	R	**Status:**	PRD/A	**Change #:**		**Proprietary:**	No
Type:	AC	**Prod. Type:**	0530M	**Elec. Spec:**	05WGX008	**CD Diagram:**	CD0005
Enclosure:	TEFC	**Mfg Plant:**		**Mech. Spec:**	05F006	**Layout:**	05LYF006
Frame:	145TC	**Mounting:**	F1	**Poles:**	04	**Created Date:**	03-06-2008
Base:	N	**Rotation:**	R	**Insulation:**	F	**Eff. Date:**	09-18-2015
Leads:	9#18					**Replaced By:**	
Literature:		**Elec. Diagram:**					

Nameplate NP3258E							
CAT.NO.	VECP3584T						
SPEC.	05F006X008G1						
HP	1.5 TE						
VOLTS	208-230/460						
AMP	4.6-4.2/2.1						
RPM	1760						
FRAME	145TC	HZ	60	PH	3		
SER.F.	1.15	CODE	L	DES	B	CL	F
RATING	40C AMB-CONT						
SN							
DE	6205	ODE	6205				
NEMA-NOM-EFF	88.5	PF	76				
G.MIN.EFF	86.5	CC	010A				
T. CODE	T4	T=	135				

Nameplate NP3261E			
SPEC.	05F006X008G1		
D.E. BRG.	25BC02XP30X		
O.D.E. BRG.	25BC02XP30X		
GREASE	POLYREX EM		
RPM MAX	2700	MAX. KVAR	N/A
BLANK			
INV.TYPE	PWM		
T=	135		
C HP FR	60	C HP TO	90
CT HZ FROM	1.3	CT HZ TO	60
VT HZ FROM	0-	VT HZ TO	60
HTR-VOLTS		HTR-AMPS	
HTR-WATTS		MAX. SPACE HEATER TEMP.	

Parts List

Part Number	Description	Quantity
SA169125	SA 05F006X008G1	1.000 EA
RA157408	RA 05F006X008G1	1.000 EA
34FN3002B01	EXTERNAL FAN, PLASTIC, .637/.639 HUB W/	1.000 EA
06CB1000A02G	CONDUIT BOX, MACH GRAY	1.000 EA
RM1016	LEAD SEPARATOR GASKET - 305/306 C.P.MOTO	1.000 EA
51XW2520A12	SCREW, HEX SER SLT HD, ZN, 1/4-20 X .75	2.000 EA
11XW1032G06	10-32 X .38, TAPTITE II, HEX WSHR SLTD U	1.000 EA
HW3001B01	BRASS CUP WASHER, FOR #8 SCREW	1.000 EA
10XN2520S06	1/4 20X3/8 HX HD CAP S.S.	1.000 EA
WD1000B16	T&B CX70TN TERMINAL	1.000 EA
35EP1102B03G	FREP TEFC 205 BRG,GRSR,RLF,.125 NPT DRAI	1.000 EA
HW4500A19	1/4-28X1/4 SLOTTED PLUG F/S	1.000 EA
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
HA4054	SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 EA
HW5100A05	WVY WSHR F/205 & 304 BRGS	1.000 EA
35EP1329A16G	PUEP ENCL 143-5TC 205 BRG,GRSR,RLF,NPT D	1.000 EA
HW4500A19	1/4-28X1/4 SLOTTED PLUG F/S	1.000 EA
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
HA4054	SHORT T-DRAIN FITTING, .125" N.P.T.	1.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	2.000 EA
06CB1502A01G	LIPPED CONDUIT BOX LID, MACH GRAY EPOXY	1.000 EA
HA3100A28	THRUBOLT 10-32 X 8.187	4.000 EA
51XB1214A16	12-14X1.00 HXWSSLD SERTYB	1.000 EA
35FH1000A04G	SPL FAN COVER MODEL 35 (GRAY)	1.000 EA

Parts List (continued)

Part Number	Description	Quantity
10XN2520A16	1/4-20 X 1 HEX HEAD CAP SCR, ZINC PLATED	3.000 EA
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	3.000 EA
WD4100A03	DE-750 HEYCO PLUG 62MP0750 MICRO PLASTIC	1.000 EA
35FH4500A11	DRIPCOVER(W/ PRIMER)	1.000 EA
HA2001A13	35-10103 SPACER WELKER	3.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	3.000 EA
06GS1003	GASKET, KOBX LID, 1/8" THICK BLACK NEOPR	1.000 EA
10XN2520A12	O1/4-20X 3/4 HEX HEAD CAP	2.000 EA
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	2.000 EA
HW4600B32SP	V-RING SLINGER 1.000 X 1.540 X 0.240	1.000 EA
HA1005A03SP	SLINGER, OD 1.750, ID .938, 205 BRG	1.000 EA
HW2501D13SP	KEY, 3/16 SQ X 1.375	1.000 EA
HA7000A01	KEY RETAINER 7/8" DIA SHAFT	1.000 EA
MJ5001A27	32220KN GRAY SEALER *MIN BUY 4 QTS=1GAL	0.001 QT
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	2.000 EA
LB1002N	LABEL,MARINE DUTY (ON ROLLS)	1.000 EA
MJ1000A75	GREASE, POLYREX EM EXXON (USe 4824-15A)	0.050 LB
MG1025N19	PAINT, 778.50 WILKO, RELIANCE ELEC GREEN	0.022 GA
LC0005E01	CONN.DIA./WARNING LABEL (LC0005/LB1119N)	1.000 EA
LB1449	DIV-2/NEC WARNING LABEL	1.000 EA
NP3258E	SS CP SUPER-E DIV-2 UL CSA-C US EEV CC	1.000 EA
NP3261E	SS CP SUPER-E AUX DATA INFORMATION	1.000 EA
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	2.000 EA
36PA1000	PKG GRP, PRINT PK1016A06	1.000 EA

PK3082	STYROFOAM CRADLE	2.000 EA
MN416A01	TAG-INSTAL-MAINT no wire (1400/bx) 11/14	1.000 EA

AC Induction Motor Performance Data

Record # 47108 - Typical performance - not guaranteed values

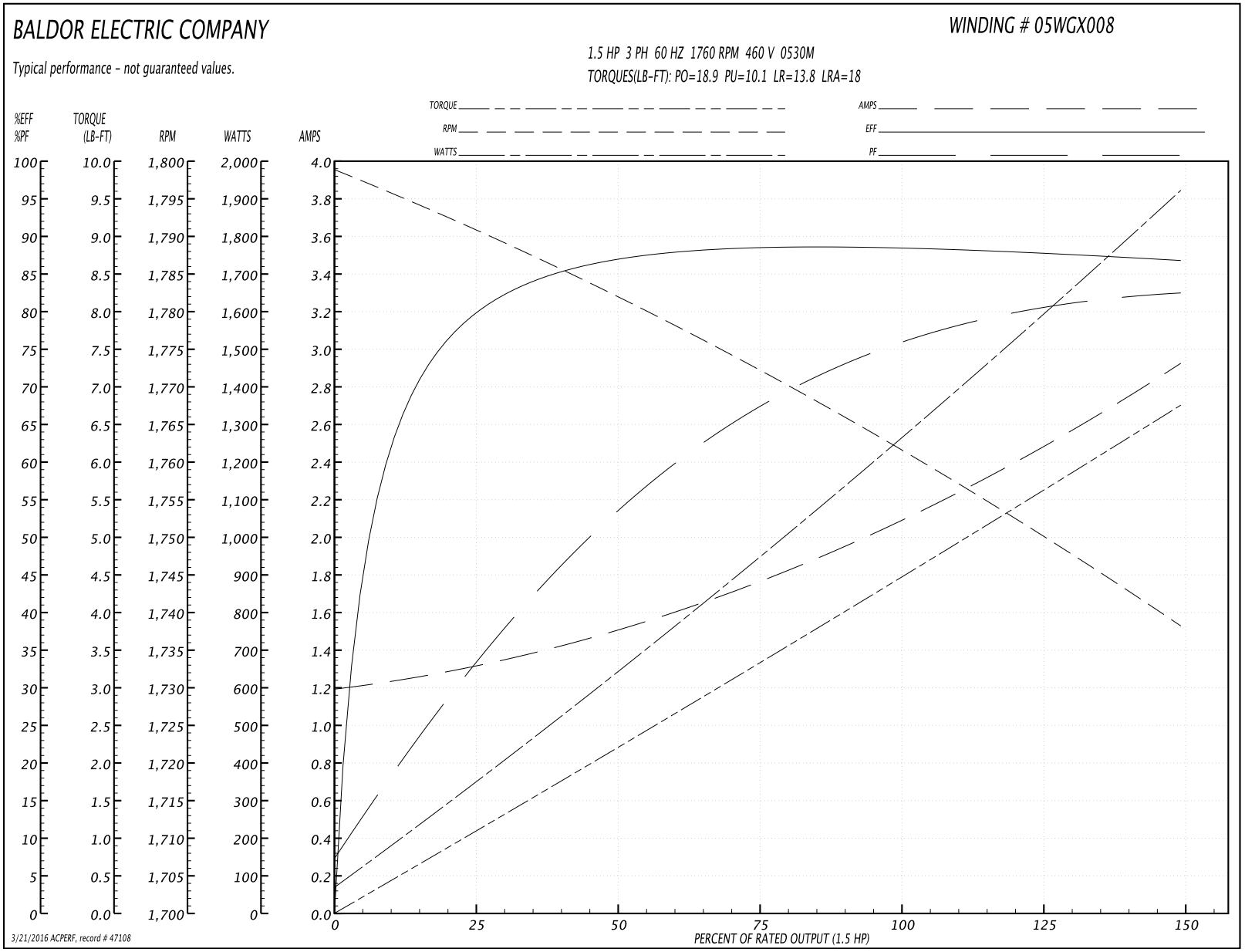
Winding: 05WGX008-R032	**Type:** 0530M	**Enclosure:** TEFC

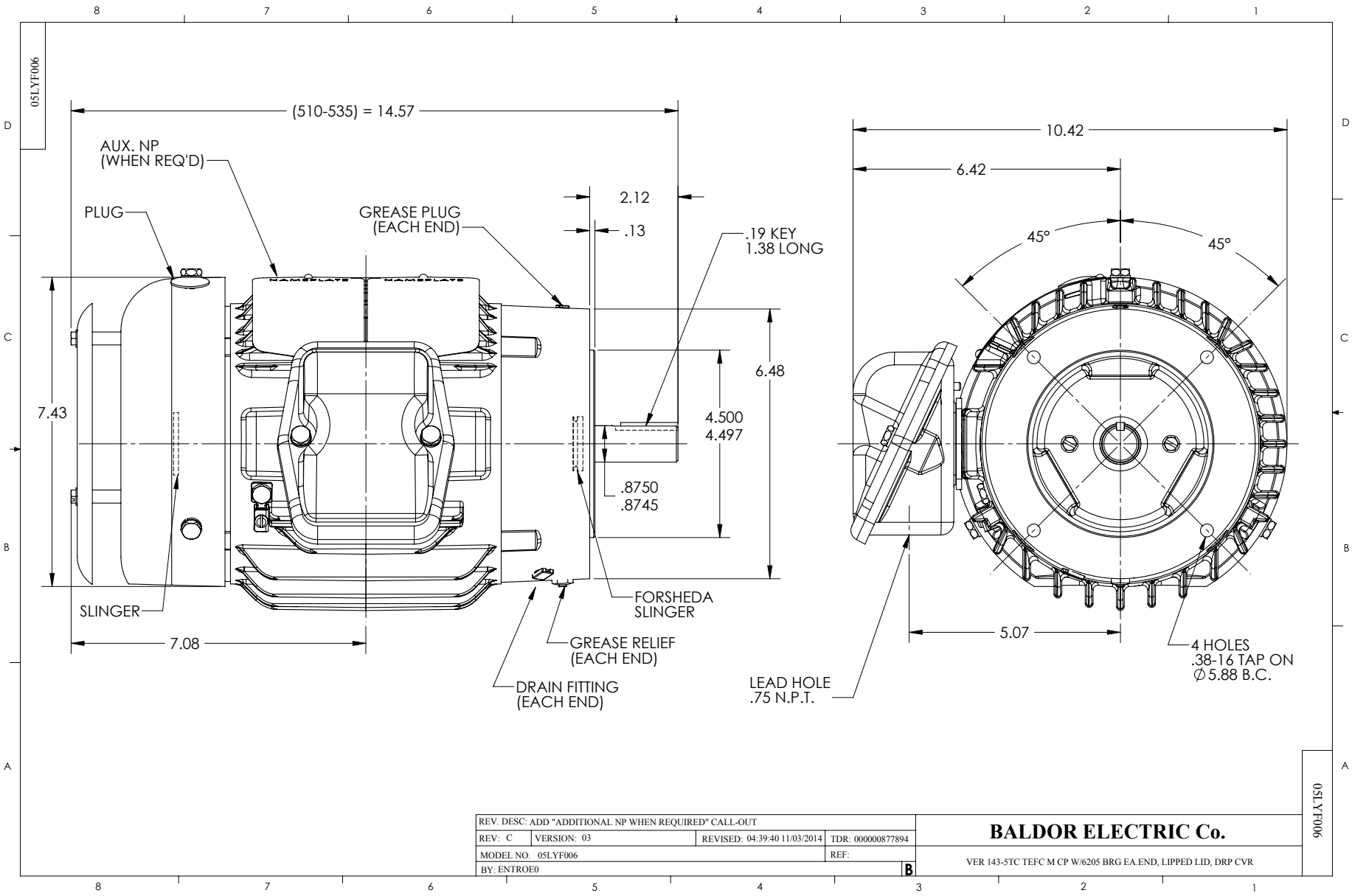
Nameplate Data				460 V, 60 Hz: High Voltage Connection	
Rated Output (HP)	1.5			Full Load Torque	4.49 LB-FT
Volts	208-230/460			Start Configuration	direct on line
Full Load Amps	4.6-4.2/2.1			Breakdown Torque	18.9 LB-FT
R.P.M.	1760			Pull-up Torque	10.1 LB-FT
Hz	60	Phase	3	Locked-rotor Torque	13.8 LB-FT
NEMA Design Code	B	KVA Code	L	Starting Current	18 A
Service Factor (S.F.)	1.15			No-load Current	1.21 A
NEMA Nom. Eff.	88.5	Power Factor	76	Line-line Res. @ 25ºC	9.69 Ω
Rating - Duty	40C AMB-CONT			Temp. Rise @ Rated Load	30°C
S.F. Amps				Temp. Rise @ S.F. Load	37°C

Load Characteristics 460 V, 60 Hz, 1.5 HP

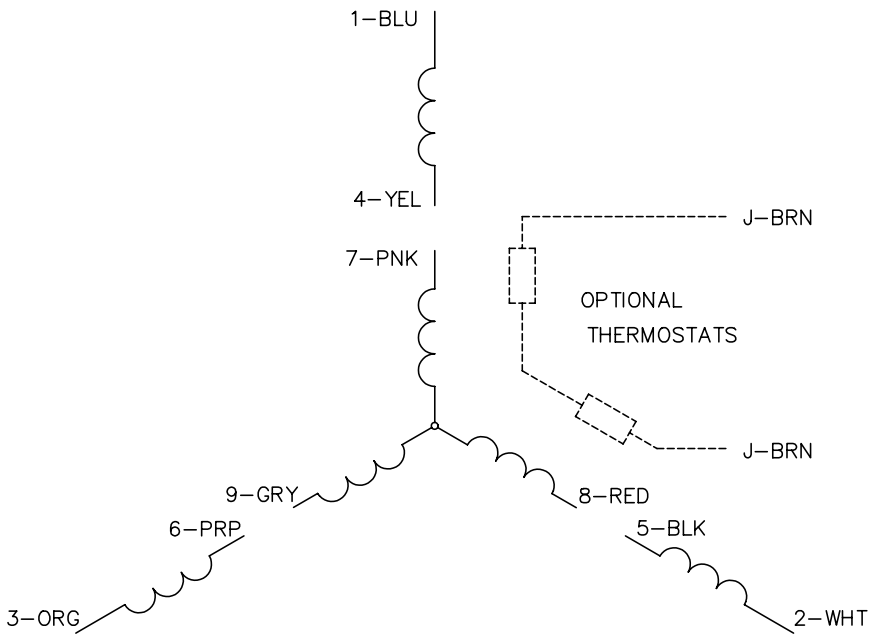
% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	33	54	67	75	80	83	78
Efficiency	78.6	86.5	88.3	89	87.9	86.7	88.3
Speed	1791	1782	1773	1761	1751	1738	1755
Line amperes	1.29	1.49	1.76	2.1	2.49	2.91	2.33

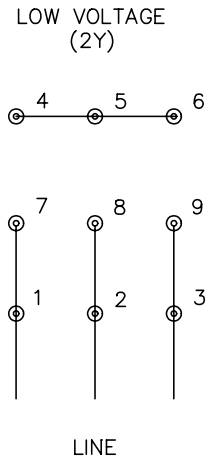
Performance Graph at 460V, 60Hz, 1.5HP Typical performance - Not guaranteed values

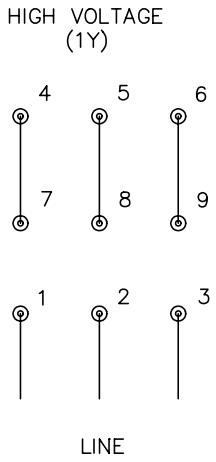




CD0005







NOTES:

1. INTERCHANGE ANY TWO LINE LEADS TO REVERSE ROTATION.
2. OPTIONAL THERMOSTATS ARE PROVIDED WHEN SPECIFIED.
3. ACTUAL NUMBER OF INTERNAL PARALLEL CIRCUITS MAY BE A MULTIPLE OF THOSE SHOWN ABOVE.
4. LEAD COLORS ARE OPTIONAL. LEADS MUST ALWAYS BE NUMBERED AS SHOWN.

CD0005

REV. DESC: REVISE TO SHOW OPTIONAL COLORS			BALDOR ELECTRIC Co.
REV. LTR: E	BY: JLP	REVISED: 01/19/99 10:15	TDR: 0171435
CD0005		FILE: AAA00005140	MDL: –
		MTL: –	3PH, DV, 9 LEADS

LocTite 242 Medium Duty Thread Locker Data

LOCTITE® 242

June 2004

PRODUCT DESCRIPTION

LOCTITE® 242 provides the following product characteristics:

Technology	Acrylic
Chemical Type	Dimethacrylate ester
Appearance (uncured)	Blue liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Viscosity	Medium, thixotropic
Cure	Anaerobic
Secondary Cure	Activator
Application	Threadlocking
Strength	Medium

LOCTITE® 242 is designed for the locking and sealing of threaded fasteners which require normal disassembly with standard hand tools. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. Particularly suitable for applications on less active substrates such as stainless steel and plated surfaces, where disassembly with hand tools is required for servicing. The thixotropic nature of LOCTITE® 242 reduces the migration of liquid product after application to the substrate.

Mil-S-46163A

LOCTITE® 242 is tested to the lot requirements of Military Specification Mil-S-46163A.

ASTM D5363

Each lot of adhesive produced in North America is tested to the general requirements defined in paragraphs 5.1.1 and 5.1.2 and to the Detail Requirements defined in section 5.2

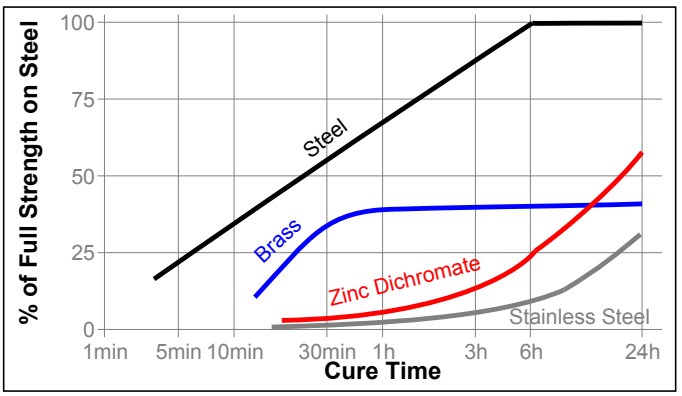
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.00
Flash Point - See MSDS	
Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 3, speed 2 rpm, Helipath	≥5,000[LMS]
Spindle 3, speed 20 rpm, Helipath	800 to 1,600[LMS]
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 3, speed 20 rpm	*900 to 1,400[LMS]

TYPICAL CURING PERFORMANCE

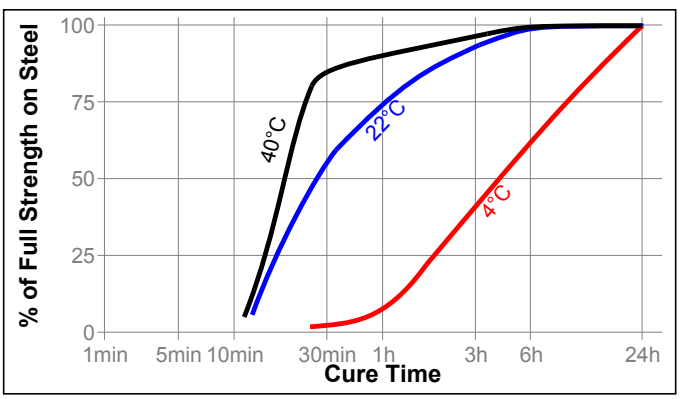
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the breakaway strength developed with time on M10 steel nuts and bolts compared to different materials and tested according to ISO 10964.



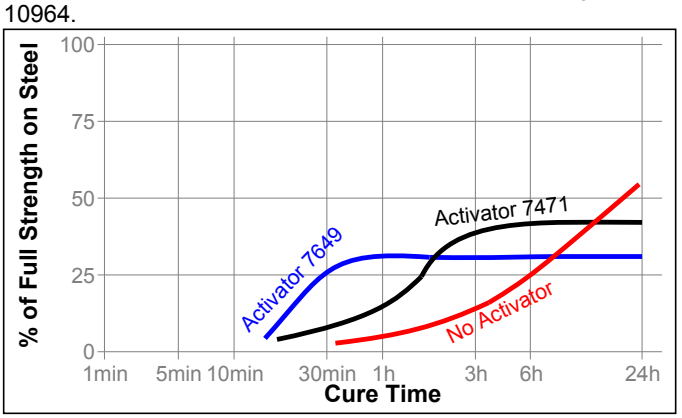
Cure Speed vs. Temperature

The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 10964.



Cure Speed vs. Activator

Where cure speed is unacceptably long, or large gaps are present, applying activator to the surface will improve cure speed. The graph below shows breakaway strength developed with time using Activator 7471 and 7649 on M10 zinc dichromate steel nuts and bolts and tested according to ISO 10964.



TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

After 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	7.90 to 17[LMS] (70 to 150)
3/8 x 16 cadmium nuts and bolts	N·m (lb.in.)	1.10 to 6.80[LMS] (10 to 60)
3/8 x 16 zinc nuts and bolts	N·m (lb.in.)	2.30 to 6.80[LMS] (20 to 60)
M10 black oxide steel nuts and bolts	N·m (lb.in.)	*8 to 19[LMS] (71 to 168)

Prevail Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	2.80 to 6.80[LMS] (25 to 60)
3/8 x 16 cadmium nuts and bolts	N·m (lb.in.)	0.50 to 4.50[LMS] (4 to 40)
3/8 x 16 zinc nuts and bolts	N·m (lb.in.)	1.10 to 4.50[LMS] (10 to 40)

Lubricity, ASTM D 5648, %:

M10 black oxide steel bolts and mild steel nuts	-10 to +10[LMS]

After 1 hour @ 22 °C

Breakaway Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	5.60 to 17[LMS] (50 to 150)

Prevail Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	1.70 to 6.80[LMS] (15 to 60)

TYPICAL ENVIRONMENTAL RESISTANCE

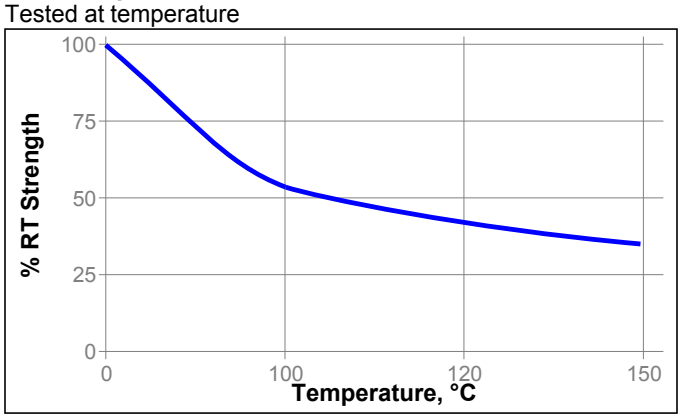
Cured for 24 hours @ 22 °C

Breakloose Torque, ISO 10964:

M10 steel nuts and bolts

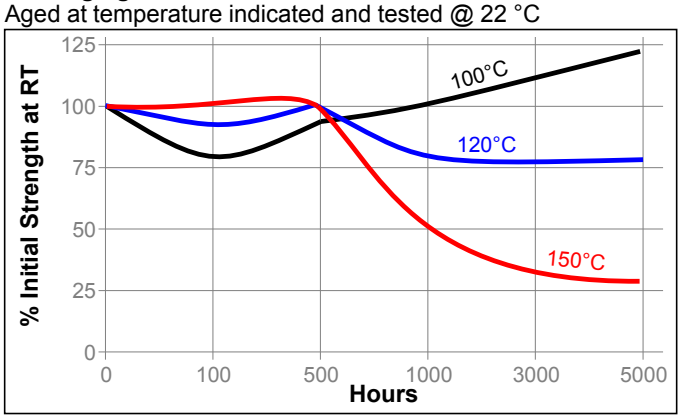
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength		
Environment	**°C**	**100 hr**	**500 hr**	**1000 hr**
Motor Oil	125	100	100	100
Unleaded Gasoline	22	100	100	95
Leaded Gasoline I	22	100	100	100
Brake fluid	22	100	100	100
Ethanol	22	100	100	95
Acetone	22	100	100	85
1,1,1 Trichloroethane	22	100	100	90
Water Glycol 50/50	87	80	75	70

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

Directions for use

For Assembly

1. For best results, clean all surfaces (external and internal) with a Loctite cleaning solvent and allow to dry.
2. If the material is an inactive metal or the cure speed is to slow, spray all threads with Activator 7471 or 7649 and allow to dry.
3. Shake the product thoroughly before use.
4. To prevent the product from clogging in the nozzle, do not allow the tip to touch metal surfaces during application.
5. **For Thru Holes**, apply several drops of the product onto the bolt at the nut engagement area.
6. **For Blind Holes**, apply several drops of the product down the internal threads to the bottom of the hole.

7. **For Sealing Applications**, apply a 360° bead of product to the leading threads of the male fitting, leaving the first thread free. Force the material into the threads to thouroughly fill the voids. For bigger threads and voids, adjust product amount accordingly and apply a 360° bead of product on the female threads also.
8. Assemble and tighten as required.

For Disassembly

1. Remove with standard hand tools.
2. In rare instances where hand tools do not work because of excessive engagement length, apply localized heat to nut or bolt to approximately 250 °C. Disassemble while hot.

For Cleanup

1. Cured product can be removed with a combination of soaking in a Loctite solvent and mechanical abrasion such as a wire brush.

Loctite Material Specification[LMS]

LMS dated October 16, 1995 (*October 7, 1999). Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Loctite Quality.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.
Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties. Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·mm x 0.142 = oz·in
mPa·s = cP

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage

Reference 0.2

LocTite 271 Heavy Duty Thread Locker Data

LOCTITE® 271

August 2004

PRODUCT DESCRIPTION

LOCTITE® 271 provides the following product characteristics:

Technology	Acrylic
Chemical Type	Dimethacrylate ester
Appearance (uncured)	Red LMS
Fluorescence	Positive under UV light LMS
Components	One component - requires no mixing
Viscosity	Low, thixotropic
Cure	Anaerobic
Secondary Cure	Activator
Application	Threadlocking
Strength	High

LOCTITE® 271 is designed for the permanent locking and sealing of threaded fasteners. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. Typical applications include the locking and sealing of large bolts and studs (M25 and larger). The thixotropic nature of LOCTITE® 271 reduces the migration of liquid product after application to the substrate.

Mil-S-46163A

LOCTITE® 271 is tested to the lot requirements of Military Specification Mil-S-46163A.

ASTM D5363

Each lot of adhesive produced in North America is tested to the general requirements defined in paragraphs 5.1.1 and 5.1.2 and to the Detail Requirements defined in section 5.2

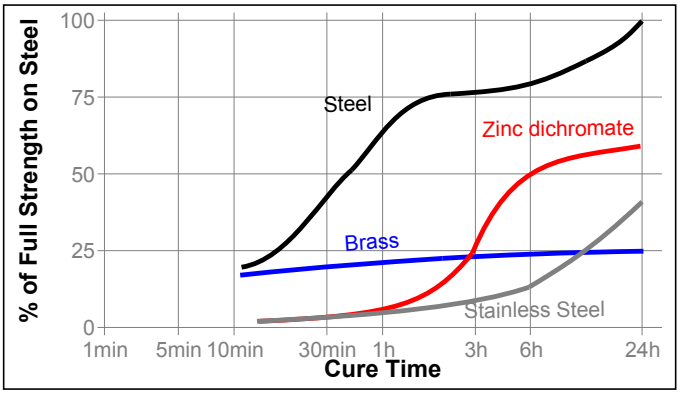
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.1
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 1, speed 10 rpm	400 to 600 LMS

TYPICAL CURING PERFORMANCE

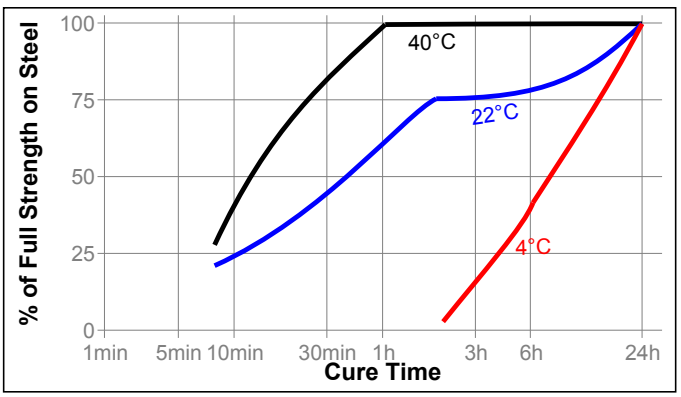
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the breakaway strength developed with time on M10 steel nuts and bolts compared to different materials and tested according to ISO 10964.



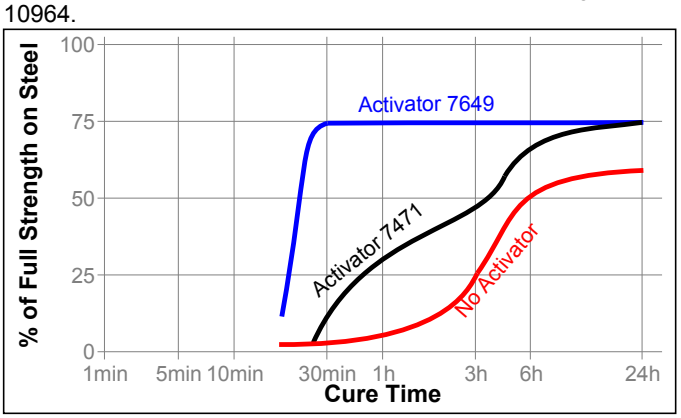
Cure Speed vs. Temperature

The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 10964.



Cure Speed vs. Activator

Where cure speed is unacceptably long, or large gaps are present, applying activator to the surface will improve cure speed. The graph below shows breakaway strength developed with time using Activator 7471 and 7649 on M10 zinc dichromate steel nuts and bolts and tested according to ISO 10964.



TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

After 90 minutes @ 22 °C

Breakaway Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	8.5 to 25.4[LMS] (75 to 225)

Prevail Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	16.9 to 34[LMS] (150 to 300)

After 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	16.9 to 34[LMS] (150 to 300)
3/8 x 16 cadmium nuts and bolts	N·m (lb.in.)	4.5 to 14.1[LMS] (40 to 125)
3/8 x 16 zinc nuts and bolts	N·m (lb.in.)	4.5 to 14.1[LMS] (40 to 125)
M10 steel nuts and bolts	N·m (lb.in.)	17 to 40 (150 to 350)

Prevail Torque, ISO 10964:

3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m (lb.in.)	22.6 to 40[LMS] (200 to 355)
3/8 x 16 cadmium nuts and bolts	N·m (lb.in.)	16.9 to 34[LMS] (150 to 300)
3/8 x 16 zinc nuts and bolts	N·m (lb.in.)	16.9 to 34[LMS] (150 to 300)
M10 steel nuts and bolts	N·m (lb.in.)	23 to 40 (200 to 350)

TYPICAL ENVIRONMENTAL RESISTANCE

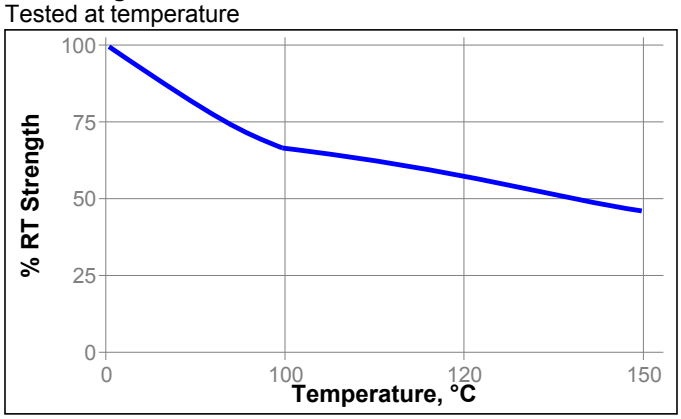
Cured for 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

M10 steel nuts and bolts

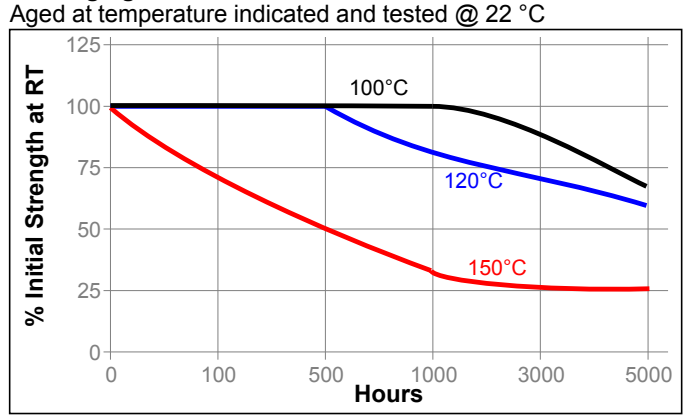
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
Motor Oil	125	85	85	75
Unleaded Gasoline	22	100	100	95
Leaded Gasoline I	22	100	100	100
Brake fluid	22	100	100	100
Ethanol	22	95	95	95
Acetone	22	95	95	95
1,1,1 Trichloroethane	22	100	95	95
Water Glycol 50/50	87	100	85	85

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

Directions for use

For Assembly

1. For best results, clean all surfaces (external and internal) with a Loctite cleaning solvent and allow to dry.
2. If the material is an inactive metal or the cure speed is too slow, spray all threads with Activator 7471 or 7649 and allow to dry.
3. Shake the product thoroughly before use.
4. To prevent the product from clogging in the nozzle, do not allow the tip to touch metal surfaces during application.
5. **For Thru Holes**, apply several drops of the product onto the bolt at the nut engagement area.
6. **For Blind Holes**, apply several drops of the product down the internal threads to the bottom of the hole.

7. **For Sealing Applications**, apply a 360° bead of product to the leading threads of the male fitting, leaving the first thread free. Force the material into the threads to thouroughly fill the voids. For bigger threads and voids, adjust product amount accordingly and apply a 360° bead of product on the female threads also.
8. Assemble and tighten as required.

For Disassembly

1. Apply localized heat to nut or bolt to approximately 250 °C. Disassemble while hot.

For Cleanup

1. Cured product can be removed with a combination of soaking in a Loctite solvent and mechanical abrasion such as a wire brush.

Loctite Material Specification[LMS]

LMS dated August 23, 1999. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Loctite Quality.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.
Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties. Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm^2 x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·mm x 0.142 = oz·in
mPa·s = cP

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

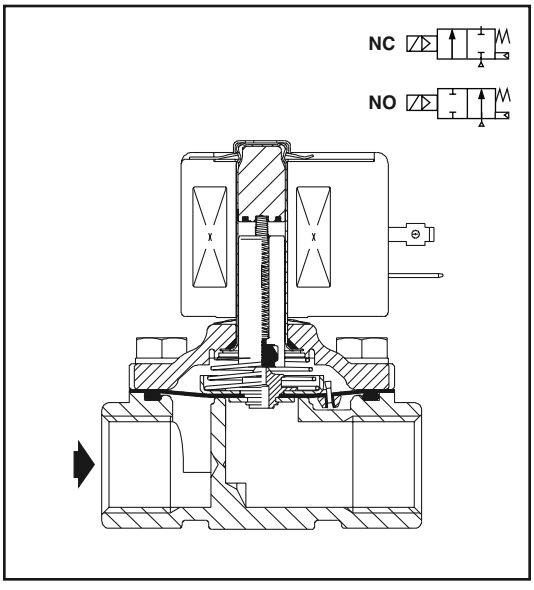
Trademark usage

Reference 1

Screen Spray Solenoid Valve Data

Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage
- High Flow Valves for liquid, corrosive, and air/inert gas service
- Industrial applications include:
  - Car wash
  - Laundry equipment
  - Air compressors
  - Industrial water control
  - Pumps



Construction

Valve Parts in Contact with Fluids		
Body	Brass	~~304 Stainless Steel~~
Seals and Discs	NBR ~~or PTFE~~	
Disc-Holder	PA	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	~~Silver~~

Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
		AC			General Purpose		Explosionproof	
	DC Watts	Watts	VA Holding	VA Inrush	AC	DC	AC	DC
~~F~~		~~6.1~~	~~16~~	~~40~~	238210	-	~~238214~~	-
~~F~~	~~11.6~~	~~10.1~~	~~25~~	~~70~~	238610	238710	~~238614~~	~~238714~~
F	~~16.8~~	16.1	35	180	272610	~~97617~~	~~272614~~	~~97617~~
~~F~~	-	17.1	40	93	238610	-	238614	-
F	-	~~20~~	43	240	99257		99257	-
F	-	20.1	48	~~240~~	272610	-	272614	-
H	30.6		-	-	-	~~74073~~	-	74073
~~H~~	40.6	-	-	-	-	238910	-	~~238914~~

Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.
Other voltages available when required.

Solenoid Enclosures

Standard: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

Optional: RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.

(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)
See Optional Features Section for other available options.

Nominal Ambient Temp. Ranges

RedHat II/
RedHat AC: 32˚F to 125˚F (0˚C to 52˚C)

RedHat II DC: 32˚F to 104˚F (0˚C to 40˚C)
RedHat DC: 32˚F to 77˚F (0˚C to 25˚C)
(104˚F/40˚C occasionally)

Refer to Engineering Section for details.

Approvals

CSA certified. RedHat II meets applicable CE directives.
Refer to Engineering Section for details.

2/2 SERIES 8210

ASCO®

Specifications (English units)

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Operating Pressure Differential (psi)							Max. Fluid Temp. °F		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ⑦	
			Min.	Max. AC			Max. DC			AC	DC	Catalog Number	Const. Ref. ④	UL ⑤ Listing	Catalog Number	Const. Ref. ④	UL ⑤ Listing	AC	DC
				Air-Inert Gas	Water	Light Oil @ 300 SSU	Air-Inert Gas	Water	Light Oil @ 300 SSU										
NORMALLY CLOSED (Closed when de-energized), NBR or PTFE ② Seating																			
3/8	3/8	1.5	①	150	125	-	40	40	-	180	150	8210G073 ③	1P	●	8210G036 ③	1P	●	6.1/F	11.6/F
3/8	5/8	3	0	150	150	-	40	40	-	180	150	8210G093	5D	❍	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	200	150	135	125	100	100	180	150	8210G001	6D	❍	-	-	-	6.1/F	11.6/F
3/8	5/8	3	5	300	300	300	-	-	-	175	-	8210G006	5D	❍	-	-	-	17.1/F	-
1/2	7/16	2.2	①	150	125	-	40	40	-	180	150	8210G015 ③	2P	●	8210G037 ③	2P	●	6.1/F	11.6/F
1/2	5/8	4	0	150	150	-	40	40	-	180	150	8210G094	5D	❍	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	40	40	-	175	150	-	-	-	8210G087	7D	●	17.1/F	11.6/F
1/2	5/8	4	5	200	150	135	125	100	100	180	150	8210G002	6D	❍	-	-	-	6.1/F	11.6/F
1/2	5/8	4	5	300	300	300	-	-	-	175	-	8210G007	5D	❍	-	-	-	17.1/F	-
1/2	3/4	4	5	-	300	-	-	300	-	180	125	8210G227	5D	❍	-	-	-	17.1/F	40.6/H
3/4	5/8	4.5	0	150	150	125	40	40	-	175	150	-	-	-	8210G088	7D	●	17.1/F	11.6/F
3/4	3/4	5	5	125	125	125	100	90	75	180	150	8210G009	9D	❍	-	-	-	6.1/F	11.6/F
3/4	3/4	5	0	150	150	-	40	40	-	180	150	8210G095	8D	❍	-	-	-	10.1/F	11.6/F
3/4	3/4	6.5	5	250	150	100	125	125	125	180	150	8210G003	11D	❍	-	-	-	6.1/F	11.6/F
3/4	3/4	6	0	-	-	-	200	180	180	-	77	8210B026 ② ‡	10P	-	-	-	-	-	30.6/H
3/4	3/4	6	0	350	300	200	-	-	-	200	-	8210G026 ② ‡	40P	●	-	-	-	16.1F	-
1	1	13	0	-	-	-	100	100	80	-	77	8210B054 ‡	31D	-	8210D089	15D	-	-	30.6/H
1	1	13	0	150	125	125	-	-	-	180	-	8210G054	41D	●	8210G089	15D	●	16.1/F	-
1	1	13	5	150	150	100	125	125	125	180	150	8210G004	12D	❍	-	-	-	6.1/F	11.6/F
1	1	13.5	0	300	225	115	-	-	-	200	-	8210G027 ‡	42P	●	-	-	-	20.1/F	-
1	1	13.5	10	300	300	300	-	-	-	175	-	8210G078 ②	13P	-	-	-	-	17.1/F	-
1 1/4	1 1/8	15	0	-	-	-	100	100	80	-	77	8210B055 ‡	32D	-	-	-	-	-	30.6/H
1 1/4	1 1/8	15	0	150	125	125	-	-	-	180	-	8210G055	43D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	5	150	150	100	125	125	125	180	150	8210G008	16D	❍	-	-	-	6.1/F	11.6/F
1 1/2	1 1/4	22.5	0	-	-	-	100	100	80	-	77	8210B056 ‡	33D	-	-	-	-	-	30.6/H
1 1/2	1 1/4	22.5	0	150	125	125	-	-	-	180	-	8210G056	44D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	5	150	150	100	125	125	125	180	150	8210G022	18D	●	-	-	-	6.1/F	11.6/F
2	1 3/4	43	5	150	125	90	50	50	50	180	150	8210G100	20P	●	-	-	-	6.1/F	11.6/F
2 1/2	1 3/4	45	5	150	125	90	50	50	50	180	150	8210G101	21P	●	-	-	-	6.1/F	11.6/F
NORMALLY OPEN (Open when de-energized), NBR Seating (PA Disc-Holder, except as noted)																			
3/8	5/8	3	0	150	150	125	125	125	80	180	150	8210G033	23D	●	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	250	200	200	250	200	200	180	180	8210G011 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	125	125	80	180	150	8210G034	23D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G030	37D	●	10.1/F	11.6/F
1/2	5/8	4	5	250	200	200	250	200	200	180	180	8210G012 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
3/4	3/4	5.5	0	150	150	125	125	125	80	180	150	8210G035	25D	●	-	-	-	10.1/F	11.6/F
3/4	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G038	38D	●	10.1/F	11.6/F
3/4	3/4	6.5	5	-	-	-	250	200	200	-	180	8210C013	24D	●	-	-	-	-	16.8/F
3/4	3/4	6.5	5	250	200	200	-	-	-	180	-	8210G013	46D	●	-	-	-	16.1/F	-
1	1	13	0	125	125	125	-	-	-	180	-	8210B057 ⑥ ⑩	34D	●	-	-	-	20/F	-
1	1	13	5	-	-	-	125	125	125	-	180	8210D014	26D	●	-	-	-	-	16.8/F
1	1	13	5	150	150	125	-	-	-	180	-	8210G014	47D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	0	125	125	125	-	-	-	180	-	8210B058 ⑥ ⑩	35D	●	-	-	-	20/F	-
1 1/4	1 1/8	15	5	-	-	-	125	125	125	-	180	8210D018	28D	●	-	-	-	-	16.8/F
1 1/4	1 1/8	15	5	150	150	125	-	-	-	180	-	8210G018	48D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	0	125	125	125	-	-	-	180	-	8210B059 ⑥ ⑩	36D	●	-	-	-	20/F	-
1 1/2	1 1/4	22.5	5	-	-	-	125	125	125	-	180	8210D032	29D	●	-	-	-	-	16.8/F
1 1/2	1 1/4	22.5	5	150	150	125	-	-	-	180	-	8210G032	49D	●	-	-	-	16.1/F	-
2	1 3/4	43	5	-	-	-	125	125	125	-	150	8210 103	30P	●	-	-	-	-	16.8/F
2	1 3/4	43	5	125	125	125	-	-	-	180	-	8210G103	50P	●	-	-	-	16.1/F	-
2 1/2	1 3/4	45	5	-	-	-	125	125	125	-	150	8210 104	27P	●	-	-	-	-	16.8/F
2 1/2	1 3/4	45	5	125	125	125	-	-	-	180	-	8210G104	51P	●	-			16.1/F	-

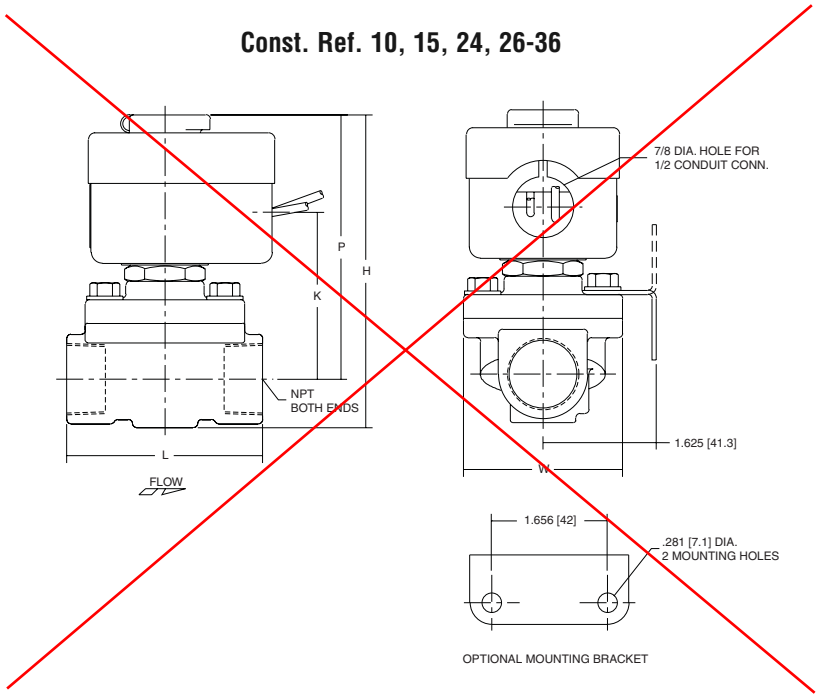
① 5 psi on Air; 1 psi on Water.
② Valve provided with PTFE main disc.
③ Valve includes Ultem (G.E. trademark) piston.
④ Letter "D" denotes diaphragm construction; "P" denotes piston construction.
⑤ ❍ Safety Shutoff Valve; ● General Purpose Valve.
Refer to Engineering Section (Approvals) for details.
⑥ Valves not available with Explosionproof enclosures.
⑦ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts.
⑧ AC construction also has PA seating.
⑨ No disc-holder.
⑩ Stainless steel disc-holder.
‡ Must have solenoid mounted vertical and upright.

Dimensions: inches (mm)

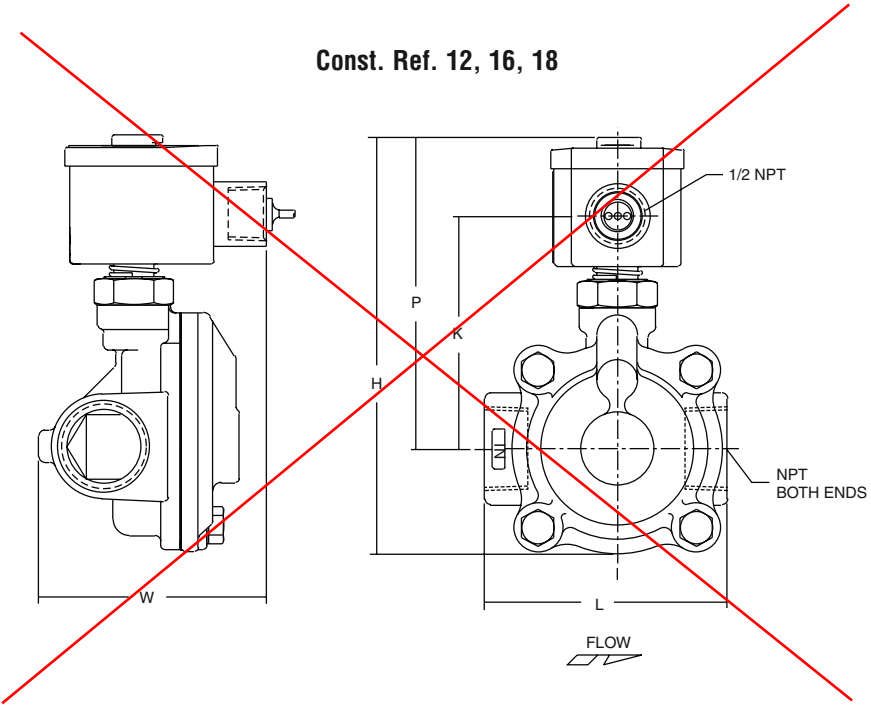
Const. Ref.		H	K	L	P	W
30	ins.	8.22	X	5.06	5.47	4.87
	mm	209	X	129	139	124
31	ins.	5.25	X	3.75	4.44	3.25
	mm	133	X	95	113	83
32	ins.	5.69	X	3.66	4.69	3.25
	mm	145	X	93	119	83
33	ins.	6.06	X	4.38	4.94	3.91
	mm	154	X	111	125	99
34	ins.	6.91	X	3.75	6.09	3.25
	mm	176	X	95	155	83
35	ins.	7.34	X	3.66	6.34	3.25
	mm	186	X	93	161	83
36	ins.	7.66	X	4.38	6.56	3.91
	mm	1.95	X	111	167	99
37	ins.	4.61	2.75	2.81	3.89	2.39
	mm	117	70	71	99	61
38	ins.	4.61	2.75	2.81	3.89	2.39
	mm	117	70	71	99	61
39	ins.	5.42	2.31	2.75	4.86	3.80
	mm	138	59	70	123	97
40	ins.	5.20	3.29	2.81	4.50	2.28
	mm	132	83	71	114	58
41	ins.	5.13	3.10	3.75	4.32	3.25
	mm	130	79	95	110	83
42	ins.	6.43	4.40	3.93	5.62	3.25
	mm	163	112	100	143	83
43	ins.	5.57	3.35	3.66	4.57	3.25
	mm	142	85	93	116	83
44	ins.	5.90	3.57	4.38	4.79	3.91
	mm	150	91	111	122	99
45	ins.	5.26	3.17	3.75	4.38	3.84
	mm	134	81	95	111	98
46	ins.	4.95	3.10	3.84	4.31	2.75
	mm	126	79	98	110	70
47	ins.	6.43	3.59	3.75	4.81	3.52
	mm	163	91	95	122	90
48	ins.	6.43	3.59	3.66	4.81	3.73
	mm	163	91	93	122	95
49	ins.	6.91	3.75	4.38	4.96	4.40
	mm	176	95	111	126	112
50	ins.	8.13	4.15	5.06	5.37	4.87
	mm	207	105	129	136	124
51	ins.	8.13	4.15	5.50	5.37	5.18
	mm	207	105	140	136	132

IMPORTANT: Valves may be mounted in any position, except as noted in specifications table.

Const. Ref. 10, 15, 24, 26-36

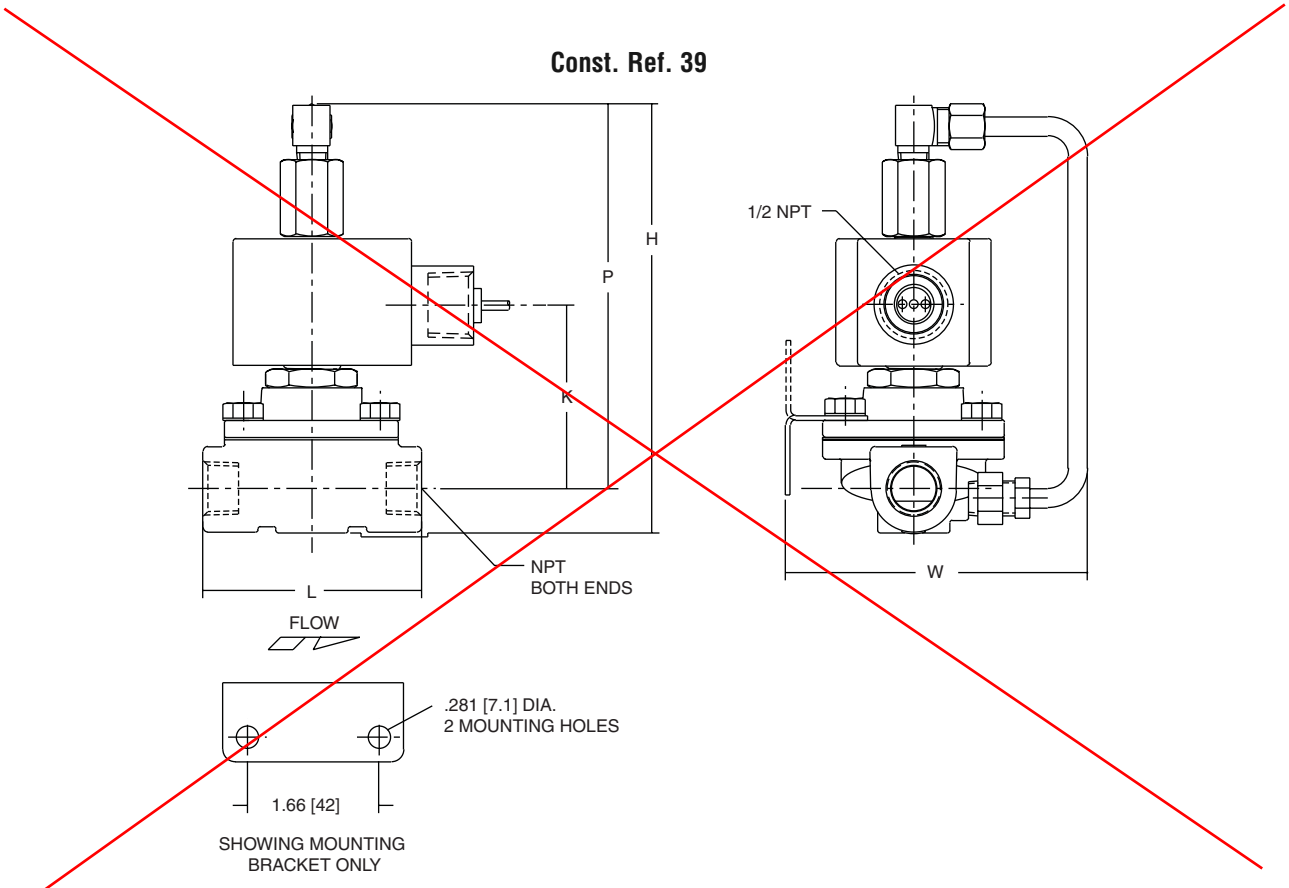


Const. Ref. 12, 16, 18

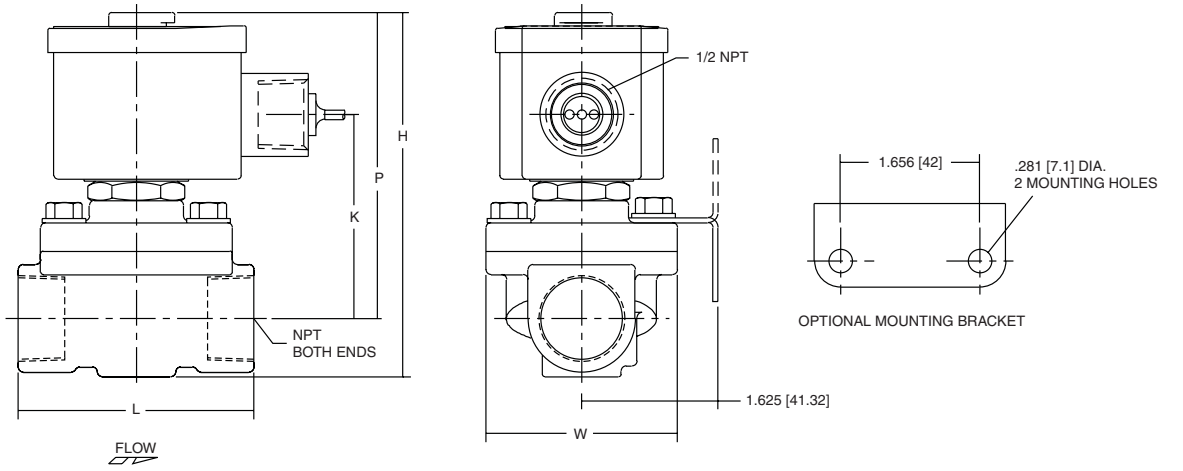


Dimensions: inches (mm)

Const. Ref. 39



Const. Ref. 40-51



Float Switch Data
(Intrinsically Safe)

Rev. 2.10

File No. LR54245

Listed 83N2

FT-300

Mechanically Activated, Narrow Angle Float Switch

- Passed NSF Standard 61 protocol by an approved Water Quality Association laboratory
- Mechanically activated, snap action contacts
- High impact, corrosion resistant, polypropylene float housing
- Not sensitive to rotation
- Control differential of 1.5 in. (4 cm) above or below horizontal

The FT series cable suspended floats are designed for high or low level indication. The FT series is a miniature switch actuated design ideally suited to operate pumps, valves and similar equipment used in municipal wastewater treatment facilities.

Standard cable lengths are 20 ft. (6 m), ~~and are available up to 30 ft. (9 m).~~ The switch operating levels are easily adjustable by altering the height of the cable fixing point.

Operational Description

This narrow angle sensing device is used to accurately monitor liquid levels in potable water, water and sewage applications.

The FT-300 is not sensitive to rotation.

Normally Open Model (high level)

The control switch turns on (closes) when the float tips slightly above horizontal, signaling a high level. It turns off (opens) when the float drops slightly below horizontal.

~~**Normally Closed Model (low level)**~~

~~The control switch turns on (closes) when the float drops slightly below horizontal, signaling a low level. It turns off (opens) when the float tips slightly above horizontal.~~

liquid level sensing

Automation Products Group, Inc.
1025 West 1700 North Tel. 1/888/525-7300
Logan, UT 84321 USA Fax 1/435/753-7490

www.apgsensors.com
sales@apgsensors.com

■ Specifications

Cable: Flexible 18 gauge, 2 conductor (UL, CSA) SJOW, water resistant (CPE)

Float: 2.74 in. dia. x 4.83 in. long (7.0 cm x 12.3 cm), high impact, corrosion resistant, polypropylene housing for use in sewage and water up to 140°F (60°C)

Maximum Water Depth: 30 ft. (9 m), 13 psi (90 kPa)

Electrical

125 VAC:
Maximum Electrical Load: 0.1 A
Minimum Electrical Load: 0.160 mA

30 VDC:
Maximum Electrical Load: 0.1 A
Minimum Electrical Load: 0.160 mA

5 VDC:
Minimum Electrical Load: 1 mA

Note: This switch can be used in hazardous locations provided they are operated in conjunction with appropriately rated and installed intrinsically safe barriers. Specifications are subject to change without notice.

■ Ordering Information

FT–300 ☐ – ☐

Configuration
- **A** (NO) Normally Open
- **B** ~~(NC) Normally Closed~~

Cable Length
- (null) 6 m
- ~~**L**__ m (Optional cable length designation)~~

liquid level sensing

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1025 West 1700 North Tel. 1/888/525-7300
Logan, UT 84321 USA Fax 1/435/753-7490
www.apgsensors.com
sales@apgsensors.com

• Introduction

This narrow angle sensing device is used to accurately monitor liquid levels in potable water, water and sewage applications. The FT-300 is not sensitive to rotation.

Normally Open Model (high level)

The control switch turns on (closes) when the float tips slightly above horizontal, signaling a high level. It turns off (opens) when the float drops slightly below horizontal.

~~Normally Closed Model (low level)~~

~~The control switch turns on (closes) when the float drops slightly below horizontal, signaling a low level. It turns off (opens) when the float tips slightly above horizontal.~~

• Specifications

Operational Version:	FT-300A Normally Open ~~FT-300B Normally Closed~~
Float:	PP housing; 2.74 in. dia. x 4.83 in. long
Max. Water Depth:	30 ft. (9 m)
Max. Temperature:	140°F (60°C)
Max. Pressure:	30 psi
Cable:	18 AWG, 2 or 3 conductor (UL, CSA), SJOW, water resistant CPE jacket
Contact Rating:	**125 VAC** Maximum Electrical Load: 0.1 A Minimum Electrical Load: 0.160 mA **30 VDC** Maximum Electrical Load: 0.1 A Minimum Electrical Load: 0.160 mA **5 VDC** Minimum Electrical Load: 1 mA

Note: This switch can be used in hazardous locations provided they are operated in conjunction with appropriately rated and installed intrinsically safe barriers.

• Installation WITH INTRINSICALLY SAFE BARRIER RELAY

Warning! – Electrical Shock Hazard
Disconnect power before installing or servicing this product. A qualified service person must install and service this product according to applicable electrical and plumbing codes.

Warning! – Explosion or Fire Hazard
Do not use this product with flammable liquids. Do not install in hazardous locations as defined by National Electrical Code ANSI/NFPA 70.

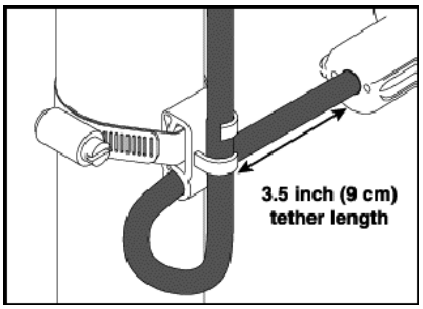
Failure to follow these precautions could result in serious injury or death. Replace product immediately if switch cable becomes damaged or severed. Keep these instructions with warranty after installation. This product must be installed in accordance with National Electrical Code ANSI/NFPA 70 so as to prevent moisture from entering or accumulating within boxes, conduit bodies, fittings, float housing or cable.

Mounting Clamp

1. Place the cord into the clamp as shown in Figure A.
2. Locate the clamp at the desired activation level and secure the clamp to the discharge pipe as shown in Figure A. **Note:** Do not install cord under hose clamp.
3. Tighten the hose clamp using a screwdriver. Over tightening may result in damage to the plastic clamp. Make sure the float cable is not allowed to touch the excess hose clamp band during operation.
4. Bring cable leads back to control device and wire according to Figure B.
5. Check installation. Allow system to cycle to ensure proper operation.

Note: All hose clamp components are made of 18-8 stainless steel material.

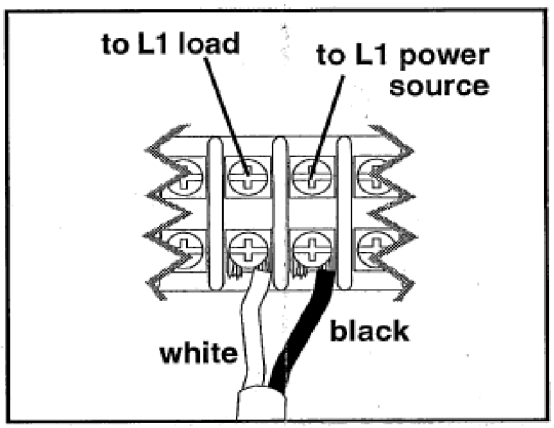
Figure A



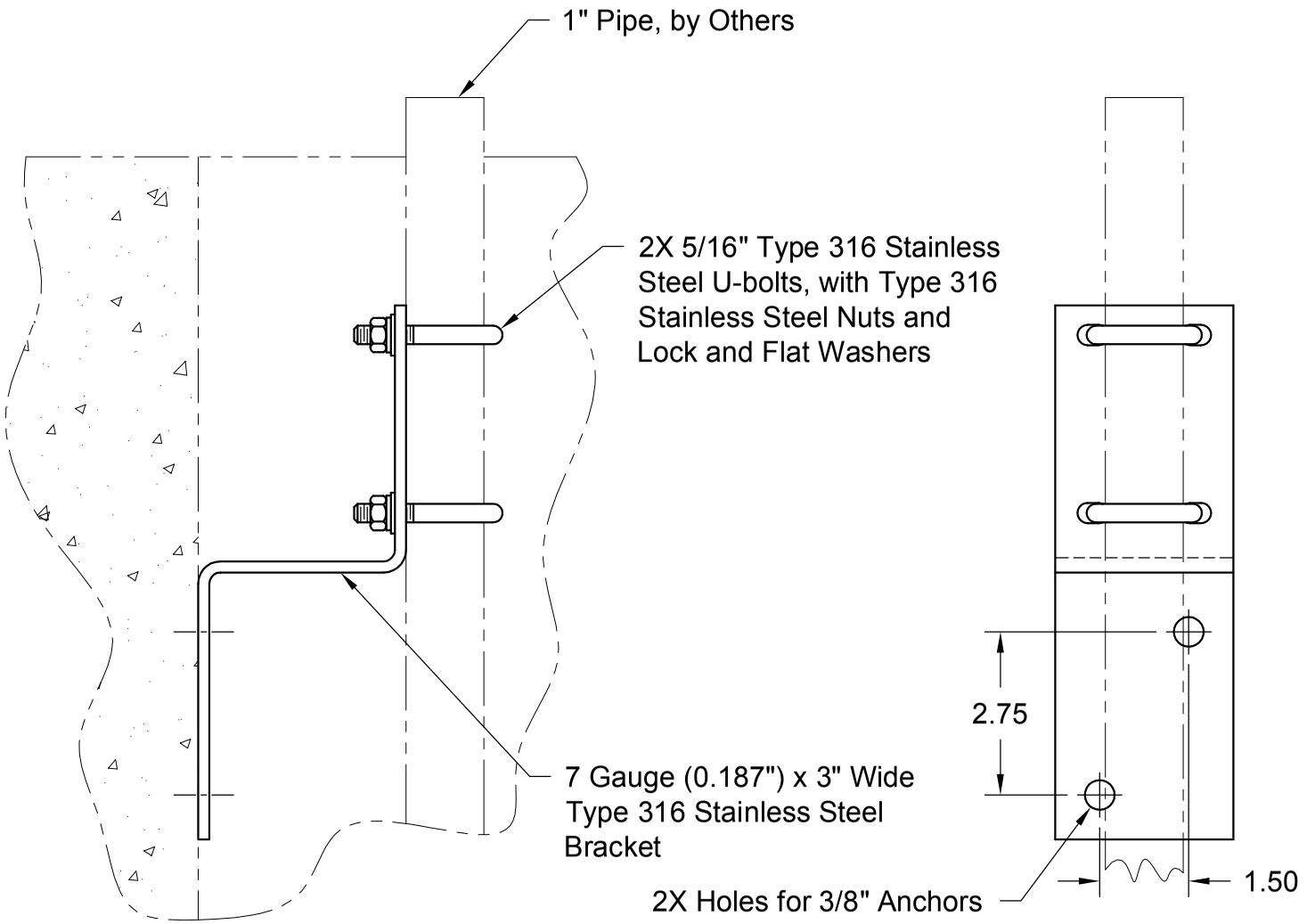
Wiring Diagram

1. For the FT-300A ~~or FT-300B~~ connect cable leads directly into control device as shown in Figure B.

Figure B



Float Switch Mounting Bracket Detail



PART THREE

AQUA WASHPRESS™
DEWATERING SCREW PRESS UNIT
AWP8

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

PARKSON
1401 W. CYPRESS CREEK ROAD
FORT LAUDERDALE, FL 33309-1969 • USA
PHONE: 954-974-6610
PARTS AND SERVICE: 1-888-PARKSON
www.parkson.com
services@parkson.com

Dated: August 31, 2016

PREFACE

THE OPERATING AND MAINTENANCE PROCEDURES OUTLINED IN THIS MANUAL ARE INTENDED AS GUIDELINES TO ASSIST THE OPERATING PERSONNEL IN THE DAY-TO-DAY OPERATION AND MAINTENANCE OF THE PARKSON UNIT OR EQUIPMENT. OPERATING PERSONNEL SHOULD ALWAYS FOLLOW PROPER SAFETY PROCEDURES IN ACCORD WITH BOTH INDUSTRY SAFETY STANDARDS AND THEIR OWN COMPANY SAFETY POLICIES WHEN PROCEEDING WITH OPERATION, MAINTENANCE AND REPAIR OF THE EQUIPMENT. THIS MANUAL IS NEITHER DESIGNED NOR INTENDED AS A SUBSTITUTE FOR SAFE OPERATING PROCEDURES WHICH MUST BE FOLLOWED WHILE IMPLEMENTING THE MAINTENANCE/OPERATION PROCEDURES OUTLINED IN THIS MANUAL. IT IS ASSUMED THAT OPERATION AND MAINTENANCE PERSONNEL ARE QUALIFIED AND EXPERIENCED. THE PRIMARY RESPONSIBILITY FOR SAFETY IN THE OPERATION AND MAINTENANCE OF THE PARKSON UNIT IS WITH THE OWNER-OPERATOR AND THE PERSONNEL CONDUCTING THE MAINTENANCE AND OPERATION.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont'd.)

TABLE OF CONTENTS (cont'd.)

FIGURES

SECTION ONE

AQUA WASHPRESS™ Dewatering Screw Press Unit
GENERAL INFORMATION

Safety Practices

⚠ DANGER ⚠

A SHARP ROTATING SCREW IS LOCATED DIRECTLY INSIDE INLET(S) AND DISCHARGE CHUTE(S).

MACHINE MAY START AUTOMATICALLY.

TO PREVENT SERIOUS INJURY OR DEATH:

- **CONSULT OPERATOR'S MANUAL BEFORE SERVICING.**
- **KEEP AWAY FROM ALL MOVING PARTS AND INLET CHUTE/GUARD DURING OPERATION.**
- **DO NOT OPERATE THE MACHINE WITHOUT GUARDS, COVERS OR THE INLET HOPPER IN PLACE.**
- **FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

IN ADDITION TO THE ABOVE, IN ORDER TO AVOID UNSAFE OR HAZARDOUS CONDITIONS, THE FOLLOWING MINIMUM PROVISIONS MUST BE STRICTLY OBSERVED:

- **THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.**

- **WHEN INSTALLING OR MAINTAINING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE, BE SURE THAT ANY LIFTING EQUIPMENT IS OF SUFFICIENT CAPACITY BEFORE LIFTING OR MOVING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE.**

- **DO NOT OPERATE A DAMAGED OR MALFUNCTIONING MECHANISM UNTIL NECESSARY ADJUSTMENTS OR REPAIRS HAVE BEEN MADE.**

- **DO NOT OVERLOAD THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR USE IT FOR ANYTHING BUT THE INTENDED USE.**

- **DO PRACTICE GOOD HOUSEKEEPING. ALWAYS INSURE THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT IS KEPT CLEAN AND THE AREA AROUND THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT FREE OF POSSIBLE HAZARDS.**

- **ALWAYS OPERATE AND PERFORM MAINTENANCE IN A MANNER THAT PROMOTES SAFE CONDITIONS. ALWAYS USE THE PROPER TOOLS, WEAR THE PROPER CLOTHING, ETC. FOR THE TASK AT HAND.**

- **A MACHINE MAY ONLY BE STARTED WHEN IT HAS BEEN DEFINITELY ESTABLISHED THAT NO PERSONNEL ARE WORKING ON IT.**

- **CHECK THAT THE MACHINE IS SECURELY MOUNTED AND THAT ALL MACHINE COMPONENTS (PARTICULARLY THE INLET CHUTE/GUARD) ARE SECURELY FITTED.**

- **KEEP AWAY FROM THE INLET HOPPER AND DISCHARGE CHUTE OF THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT. NEVER PLACE ARMS, LIMBS, OR ANY HAND HELD OBJECT OR TOOL IN A HOPPER OR IN PROXIMITY TO THE SPIRAL UNLESS THE MACHINE IS ELECTRICALLY LOCKED OUT.**

- **WHEN INSTALLING THIS PRODUCT, ALWAYS MAKE SURE THERE IS A LOCKABLE DISCONNECT WITHIN SIGHT OF THE UNIT.**

- **LOCKOUT PROCEDURES MUST BE FOLLOWED WHEN INSTALLING, MAINTAINING OR REPAIRING MACHINERY. ALWAYS DISCONNECT ALL POWER SOURCES AND LOCKOUT WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

- **MAKE SURE ANY ELECTRICAL CONNECTIONS ARE DONE BY QUALIFIED PERSONNEL AND IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS.**

- **OVERLOAD AND/OR SAFETY SWITCHES ARE EMERGENCY DEVICES. DO NOT USE THE OVERLOAD OR SAFETY SWITCHES TO STOP THE MECHANISM DURING NORMAL OPERATION.**

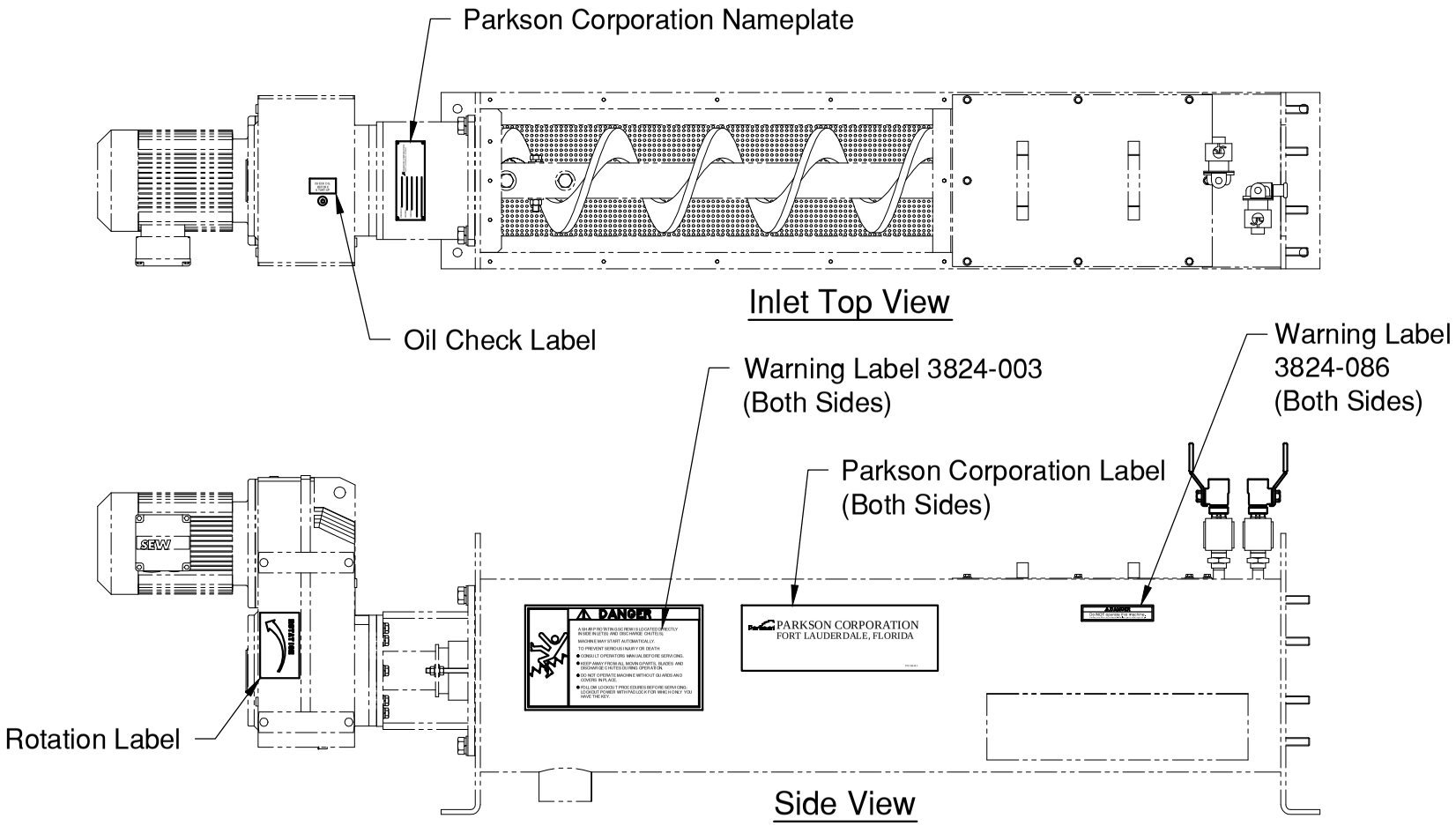
- **CONTACT WITH MATERIAL PROCESSED MAY CAUSE INFECTION OR ADVERSE REACTIONS. REPORT ANY CUTS OR INJURIES TO SUPERVISOR IMMEDIATELY AND SEEK APPROPRIATE MEDICAL ATTENTION.**

- **THIS PRODUCT HAS BEEN SUPPLIED WITH WARNING LABELS, SHOULD THEY BECOME DAMAGED, REMOVED OR ILLEGIBLE; PLEASE CONTACT PARKSON FOR NO-COST REPLACEMENT LABELS.**

  WARNING LABEL PART NUMBERS FOR THIS PRODUCT ARE 3824-003 AND 3824-086. SEE FIGURE ON PAGE 1-3A FOR PROPER LOCATION.

Label Location

1-3A



PARKSON
1401 W. CYPRESS CREEK ROAD
FORT LAUDERDALE, FL 33309-1969 · USA
PHONE: 954-974-6610
PARTS AND SERVICE: 1-888-PARKSON

Delivery and Inspection

The AQUA WASHPRESS™ Dewatering Screw Press unit is shipped as a completely assembled unit, ready for installation. Controls are to be installed by local electrical contractor.

After the unit has been unloaded, conduct a visual inspection and count of the shipping containers to determine if any shipping damage or loss of equipment occurred in transit. Be careful not to jar crates and/or to puncture crated materials with lifting forks.

NOTE: **You must report, in writing, any damaged or missing parts to the shipping carrier and Parkson within 48 hours of receipt of the unit. Purchaser shall bear the responsibility for the replacement of equipment which is determined to be missing after this period.**

To assist in identifying correct quantities and parts, reference the attached packing list on the shipping crate. A purchase order shall accompany any order to Parkson for replacement of parts which were damaged during shipment. The purchaser shall direct all shipment damage back charges to the carrier.

Equipment placed in storage and/or installed but awaiting start up, must be properly protected from damage.

CAUTION

STAINLESS STEEL MATERIAL WILL APPEAR TO RUST IF CONTAMINATED WITH WELD SPATTER, CARBON STEEL DUST FROM A GRINDING WHEEL, OR OTHER AIRBORNE OR WATERBORNE CONTAMINANTS. SPECIAL CARE MUST BE TAKEN TO PROTECT THE UNIT AT ALL TIMES.

Some material supplied for this job has had surface preparation and painting. Any bruises, mars and/or scratches caused by loading and unloading the equipment must be immediately touched up in the field prior to any storage.

NOTE: **Any painted surfaces damaged during shipment and unloading should be re-painted (to protect the surface under field storage conditions) within 14 days after receipt. Parkson will not accept any responsibility for rusting due to material which has not received additional paint in the field.**

Short Term Storage

For storage under 30 days, the equipment (including the control panel, spare parts and any other supplied loose hardware) should be covered, should be kept dry and protected from the environment, and well ventilated to prevent moisture build-up on surfaces. The equipment should be stored off the ground in the original shipping crates and away from pooled water. The unit should be isolated from passage of electrical current, shock loads or vibration during periods of non-operation, in order to avoid false brinnelling and damage to the bearings or other contact surfaces.

If storage occurs after the equipment has been used, remove any solids inside the inner trough and drain housing using the shutdown and cleaning procedures starting on page 4-4. The discharge pipe should be cleaned out if storage will be long enough to allow the screenings to dry out.

The equipment should be inspected once per week to ensure there is no excessive contamination or moisture build-up on the equipment.

Long Term Storage

For storage for a period longer than 30 days, in addition to all short term storage procedures, the reducer should be completely filled with the correct type of oil (see Lubrication Chart, see page 5-5 for proper oil selections). A long term storage tag should be attached to the reducer stating that the reducer has been filled with oil for long term storage. Prior to operation, the reducer should be drained, flushed and refilled.

Metal Surfaces – The equipment should be covered with plastic and well ventilated to prevent moisture and contaminant build-up on the surfaces. To add protection, wherever possible the metal surfaces should be coated with 7 mil (minimum) thickness of a metal protecting compound such as Zep Iron Clad or equal. Care must be taken to insure metal protecting compound does not damage any rubber or plastic components. Every precaution should be taken to prevent damage from surrounding conditions either due to the environment or job site construction, etc.

Drive Motor – The drive motor should be enclosed in a Cortec 126 Series vapor phase corrosion inhibiting (VpCI) bag (manufactured by Cortec Corporation, St. Paul, Minnesota, 800-426-7832) and the bag should also contain a Cortec 132 Series VpCI desiccant foam pad. The VpCI bag and desiccant foam pad should be replaced every 60 days or any time there is any evidence of condensation. Contact the factory for free replacement VpCI bags and pads.

Removal From Storage

When the unit is to be taken out of extended storage, remove plastic cover and refer to Section Four, Operating Instructions (page 4-1) for proper start up procedures.

Gear Drive Assembly – The gear drive should be drained and refilled with new lubricating oil. Operate for 8-16 hours and replace the oil again.

Metal Surfaces – Remove any metal protecting compound with an appropriate solvent degreaser (taking care not to damage any rubber or plastic parts). Spray clean with warm (100°-140°F) moderate pressure (100 to 300 psi) water. Caution must be exercised to insure pressure spray does not cause water to enter bearings or bushings, motor housing, etc.

Drive Motor – Remove the VpCI bag and desiccant foam pad.

SECTION TWO

AQUA WASHPRESS™ Dewatering Screw Press Unit
TECHNICAL DESCRIPTION

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

Application

The AQUA WASHPRESS™ Dewatering Screw Press unit is used to convey, wash and dewater various solid materials.

Unit Description

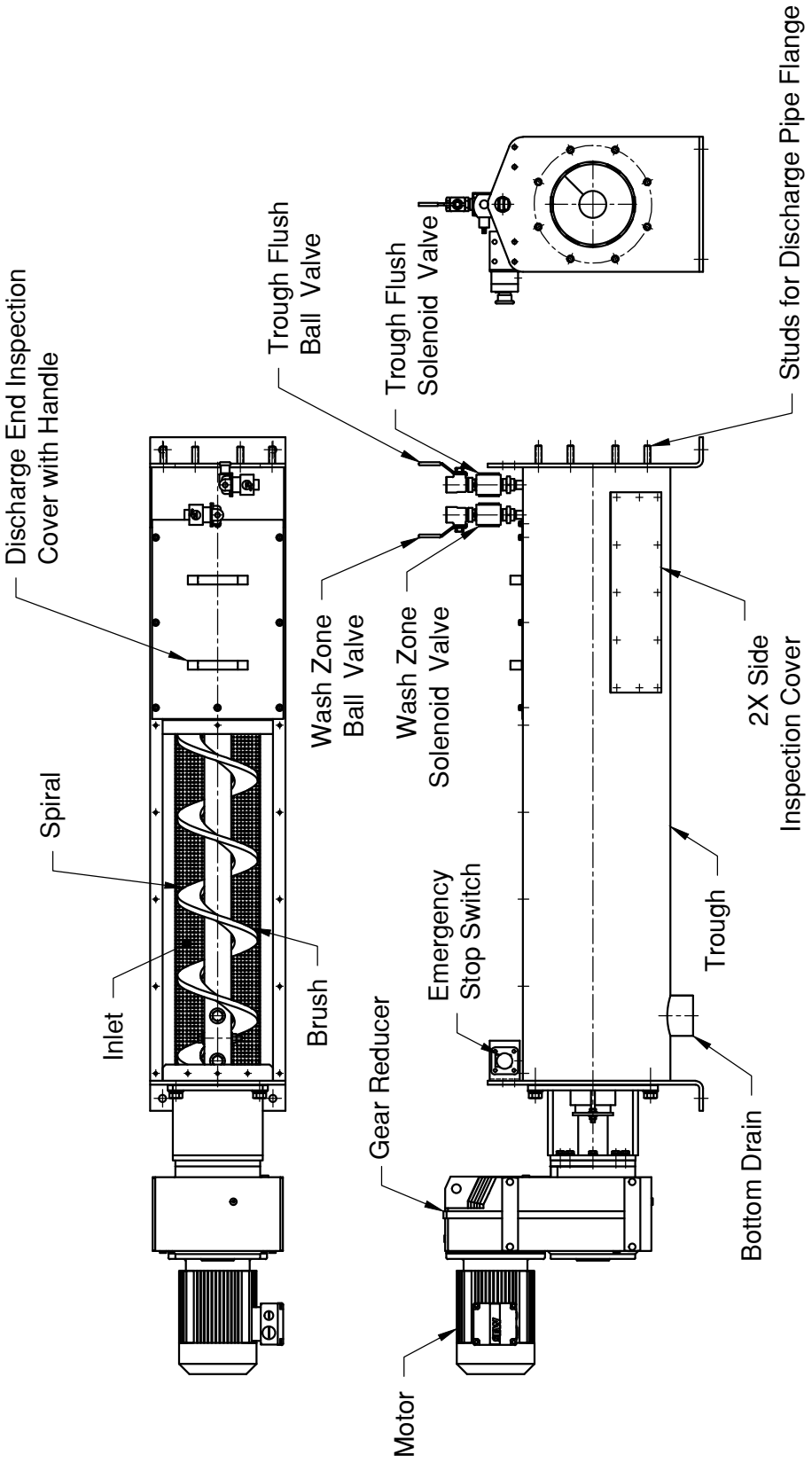
The main components of the AQUA WASHPRESS™ Dewatering Screw Press unit are an inner trough, an outer trough and drain housing, an inlet area, a shafted spiral with brush, the spray system, the discharge piping, the drive system and controls (see page 2-1A).

The inlet area consists of a perforated stainless steel U-shaped trough welded inside the outer trough and serves as the inlet area to receive solids. The perforations allow drainage of free liquid down into the outer trough. The inner trough is where the washing and pressing take place. There are bolt-in wear bars on the inside of the inner trough, which in addition to supporting the spiral also serve as maceration points for the washing cycle. The inner trough has strategically placed drain holes, chamfered on the outside, through which the pressate drains into the outer trough.

The outer trough has a drain outlet located underneath to return the pressate to the process flow. The outer trough is designed to withstand the torsional forces imposed by the pressing action.

The shafted spiral is made of prime painted high-strength carbon steel. The screw is connected to the gearbox shaft with three radial bolts. The axle is secured to the gear reducer with a washer and axial bolt.

Immediately adjacent to the solids inlet area is the washing zone. In the wash zone, water is added to rinse organic matter from the solids. The spray system is divided into two distinct functions. For washing, water is introduced into the inner trough via a T-shape spray pipe with four (4) 0.20-inch diameter orifices. The second function is to flush the inner trough of residuals.



Standard Equipment Layout

The stainless steel discharge tube is bolted to the end of the press body to create the necessary back pressure for dewatering and to direct the solids for collection.

All stainless steel components are constructed of, as a minimum, type 316 stainless steel for non-welded components and type 316L stainless steel for welded components.

The drive system normally consists of a 3-phase electric motor and a fixed speed gear reducer. Reference the Drive System Data in Section Nine.

The AQUA WASHPRESS™ Dewatering Screw Press unit is normally supplied with a control panel which would include a starter, step-down transformer, and disconnect switch to operate as stand alone control. Reference the Control Panel Bill of Materials and Control Panel Drawing for details, if applicable.

Operation

Wet screenings or other moisture laden solids are delivered to the inlet hopper(s) of the AQUA WASHPRESS™ Dewatering Screw Press unit. The accumulated solids are conveyed by the slow rotating screw to the wash zone where organics are washed off the screenings. The solids will then be conveyed to the press zone for compaction and dewatering. The AQUA WASHPRESS™ Dewatering Screw Press unit may be controlled by an equipment interlock, a cycle timer, a level sensor device or other suitable control systems.

The pressate water from the wet material drains through the inner trough perforated holes and is captured in the outer trough. This pressate water is then typically returned to the process flow stream for final treatment.

The compacted solids are directed through discharge piping. The dewatered solids are usually deposited into a dumpster or other suitable container for transport and ultimately disposal.

NOTE: **In the event that the spiral direction is reversed, observe the following:**

1) **A "Reverse" selector switch should be a momentary contact.**
2) **Do not operate the spiral in reverse for more than 1 second in any mode.**

Prolonged reversal of the spiral may cause solids to wedge between the drive end of the spiral and drive end support leg which will be difficult to remove without disassembly.

SECTION THREE

AQUA WASHPRESS™ Dewatering Screw Press Unit
INSTALLATION

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

Mechanical Work

The AQUA WASHPRESS™ Dewatering Screw Press unit is shipped completely assembled, skid mounted with protective crating and ready for site installation. No special site preparation is necessary prior to installation other than a reasonably level mounting surface and suitable anchor bolts for attachment. Prior to starting installation, check the following:

Verify wall openings and transport routes are sufficient to allow the unit to be installed.

Verify that lifting and transport equipment of suitable capacity is available. The unit is most often transported from underneath to site by a fork lift truck. If the unit is to be lifted from above, a sling with spreader bars, etc., must be used.

⚠ DANGER ⚠

WHEN INSTALLING OR MAINTAINING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE, BE SURE THAT ANY LIFTING EQUIPMENT IS OF SUFFICIENT CAPACITY BEFORE LIFTING OR MOVING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE.

Position unit in place and secure with suitable anchor bolts. Position and fasten securely any feed hopper(s) as necessary to prevent accidental contact with spiral.

Any optional components can now be installed in accordance with the installation drawing.

Check the oil level in the gear reducer and verify that breather plug is in place (see page 5-2A). If a breather plug is not installed, call factory for replacement.

There is a 4 inch OD drain tube stubs (typically supplied orientated downwards). Connect a drain line as required or allow the pressate and wash water to return directly to the channel. It is important that there are no sharp bends, smaller diameters or other flow restrictions in the drain line.

Connect spray wash feed lines. Supply 15 GPM of water at 60 psi. Do not exceed 125 psi line pressure.

Connect screening discharge piping to press body outlet flange. On longer conveying distances, it is recommended that all pipe bends and transitional pipes be conical in form.

NOTE: **Discharge piping filled with screenings will be heavy (35-50 pounds per foot plus weight of pipe), therefore, the AQUA WASHPRESS™ Dewatering Screw Press unit must be anchored properly. If discharge piping exceeds 5 feet, separate pipe supports may be required as well.**

Install the control panel at the desired location, along with the conduit from the control panel to the equipment. Power should not be turned on until Safety Practices in Section One have been reviewed and satisfied.

Electrical Work

Complete the installation by connecting electrical power to the drive motor and control panel. Reference motor nameplate for proper power supply and wiring connections. Be sure that the unit-mounted emergency stop push button station and spray wash solenoid valves have been correctly wired, that the unit is well grounded, and that all work meets National Electrical Codes as well as local wiring requirements. Test the emergency stop push buttons (unit and control panel-mounted) to ensure all electrically driven components stop if either emergency stop push button is pressed.

⚠ DANGER ⚠

MAKE SURE ANY ELECTRICAL CONNECTIONS ARE DONE BY QUALIFIED PERSONNEL AND ARE IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS.

TO PREVENT SERIOUS INJURY:

- **DO NOT OPERATE MACHINE WITHOUT HOPPERS AND COVERS IN PLACE.**
- **WHEN INSTALLING THIS PRODUCT, ALWAYS INSURE THERE IS A LOCKABLE DISCONNECT WITHIN SIGHT OF THE MACHINE.**

Confirm that the electrical power supply to the motor and the motor wiring terminations are in agreement and correct.

Confirm that the unit-mounted emergency stop push button and solenoid valves have been correctly wired and are functional.

Verify that all other electrical connections have been made in accordance with the circuit and wiring diagrams.

Inspect the unit to insure that all packaging material has been removed and the spiral is free to rotate and in the proper direction. Check to see that no construction debris or dry solids were left in the spiral or transport tube.

⚠ DANGER ⚠

ROTATING SPIRAL IS LOCATED DIRECTLY BELOW PRESS COVERS AND FEED HOPPER(S). NEVER PLACE HANDS OR LIMBS IN THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT WITHOUT LOCKING OUT MACHINE.

Check that the oil level in the reducer is at the bottom of the oil level plug before start up (see page 5-2A).

SECTION FOUR

AQUA WASHPRESS™ Dewatering Screw Press Unit
OPERATING INSTRUCTIONS

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

Start Up Procedures:

Check spiral for proper rotation. When viewed from drive end, the spiral should rotate counterclockwise when motor is "jogged on" or clockwise when viewed from discharge end. Material should be conveyed toward discharge end.

If the spiral is turning in reverse, turn off all power to the AQUA WASHPRESS™ Dewatering Screw Press control panel and exchange any two incoming power leads. Jog motor on again to insure proper rotation.

To set the overcurrent protection, locate the current monitor (located typically at the starter). Make sure that the mode selection switch is in the "over" position. Note the number of wire passes through the monitor's toroid. This determines the range and the sensitivity of the sensor.

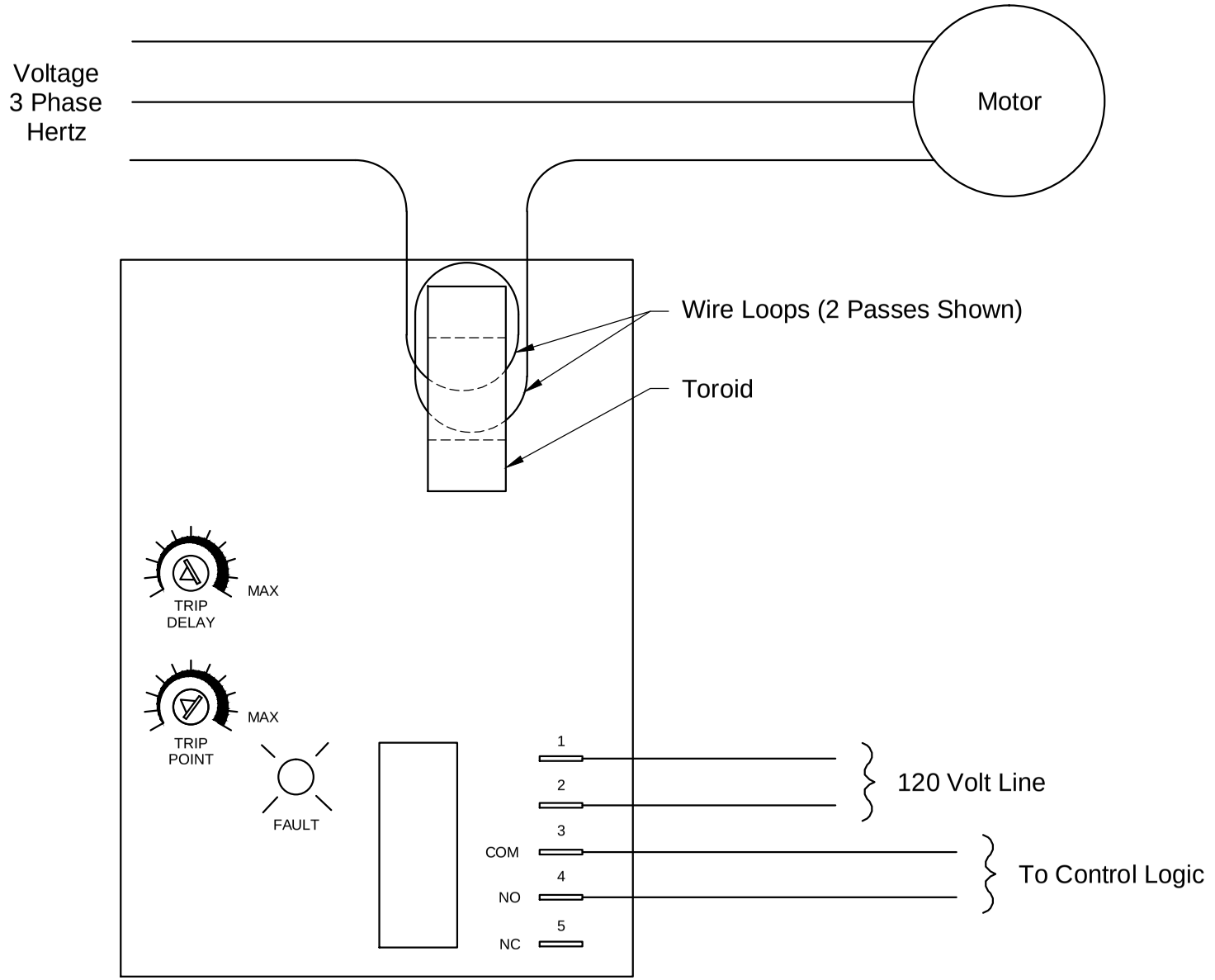
At 1 pass: 2-20 amp range
At 2 passes: 1-10 amp range
At 4 passes: .5-5 amp range

A two second timer is built in the current monitor to accommodate start up current and prevent nuisance tripping caused by normal equipment start up.

There are two (2) potentiometers on the monitor for trip point and time delay adjustments. Turning them counterclockwise will decrease and clockwise will increase set points (see page 4-1A).

Current Monitor

4-1A



When a fault is sensed (LED on) throughout the trip delay, the output relay will energize after the delay time. If fault is corrected (LED off), before the trip delay is complete, the relay will not energize and trip timer is reset. If a fault is still sensed at the end of the start up delay, a trip delay will begin. If the fault continues through the trip delay time, the relay will stop the motor.

ADJUSTMENT OF THE CURRENT SENSOR MUST BE ACCOMPLISHED WITH ELECTRICAL POWER SUPPLIED TO THE CONTROL PANEL AND WITH THE UNIT IN OPERATION. THEREFORE, EXTREME CARE MUST BE TAKEN WHEN MAKING THESE ADJUSTMENTS, AS THE POSSIBILITY OF ELECTRICAL SHOCK DOES EXIST.

It is recommended that these adjustments only be made by a qualified electrician using an insulated screwdriver. Turn the trip delay adjustment clockwise to its maximum setting. With the unit in operation, slowly rotate the trip point adjustment counterclockwise until the red LED light comes on, and then rotate the trip point knob back clockwise only enough for the red LED light to shut off. After the trip point setting has been made, rotate the trip delay adjustment counterclockwise to the minimum setting. Stop and restart the unit several times to confirm the trip point setting is high enough so the unit will not trip out under start up load. Should the unit trip out, turn the trip point knob clockwise slightly until the unit can start without tripping out.

Test spray solenoids by turning spray selector switches to Hand position.

The spray wash should continuously flush the wash zone and drain housing. If spray solenoids do not activate, check wiring connections.

If there are no mechanical problems, the unit is ready to accept solids. Always inform all area personnel of the impending start up.

KEEP AWAY FROM THE FEED HOPPER AREA. ROTATING SPIRAL LOCATED DIRECTLY BELOW COVERS AND HOPPER(S). NEVER PLACE HANDS OR LIMBS IN FEED HOPPER(S) WITHOUT LOCKING OUT MACHINE.

Upon start up, the sound of the spiral riding on the wear bars may be noticeable. As screenings are processed and as the wear bars are run in, the sound will diminish.

Operating Mode

The AQUA WASHPRESS™ Dewatering Screw Press unit should start to operate when a certain amount of screenings are located in the inlet area. It is important to know the amount of screenings loaded into the AQUA WASHPRESS™ Dewatering Screw Press unit over a given period. Count the cycles or accumulate run time of the feed equipment and then start the press. For example, a basic adjustment in combination with an AQUA GUARD® Continuous Self-Cleaning Filter Screen unit is:

> Let the screen run for a total of ten (10) minutes (adjustable accumulating timer) Then operate the AQUA WASHPRESS™ Dewatering Screw Press unit according to the attached Sequence of Operation Chart (see page 4-3A).

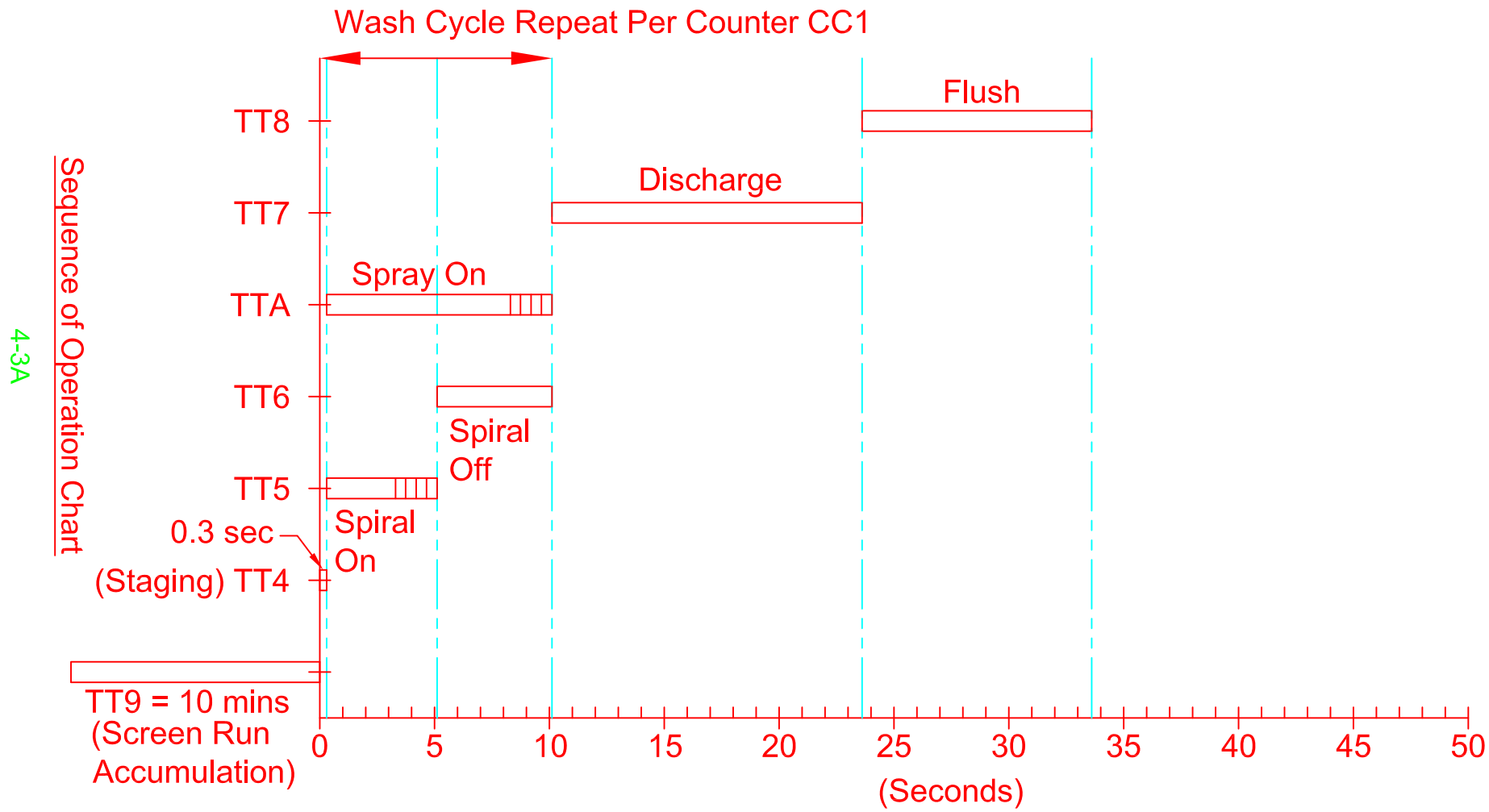
The amount of screenings in the AQUA WASHPRESS™ Dewatering Screw Press inlet should just start to cover the spiral before the wash cycle starts. Adjust the counter or accumulating timer of the feeding equipment to average this amount. The AQUA WASHPRESS™ Dewatering Screw Press unit should run for a short period of time (typically set at 0.3 seconds, depending upon the length of the unit). The wash water turns on continuously while the spiral runs for an adjustable amount of time (typically set at 4 seconds) and then stops for an adjustable amount of time (typically also set at 4 seconds). This spiral stop/start cycle should be repeated for the number of times set on the cycle counter (typically set a 6 cycles). After the cycles are completed, the wash water turns off and the spiral runs to dewater, compact and discharge the screenings (typically set at 30 seconds) and then stops. The flush water should then run (typically set at 10 seconds) to clean the drain housing.

The correct amount of wash water can be determined by watching the amount of wash water and screenings flowing back into the inlet area of the AQUA WASHPRESS™ Dewatering Screw Press unit during the spiral stopped portion of the wash cycle. The wash water should be approximately 2 inches deep maximum in the inlet area. If the wash water is less than 2 inches deep, either increase the wash water flow rate (via the ball valve) or increase the amount of time the wash water runs when the spiral is off. If the inlet trough floods or if too much of the screenings are being carried back into the inlet, decrease the wash water flow or the amount time the wash water is injected when the spiral is off.

The AQUA WASHPRESS™ Dewatering Screw Press unit is available in incremental lengths of 6 inches from 1 foot through 5 feet. Reference the Model number on the cover page. Longer AQUA WASHPRESS™ Dewatering Screw Press units may benefit from increasing the number of washing cycles by increasing the counter setting. All of the screenings should be carried out of the inlet before the discharge cycle starts.

The flush water should run as long as it takes to clean the drain housing and no more. Decrease or increase the flush time as required.

AWP8 & AWP10 Sequence of Operation



TT5 & TTA additional lines correspond to page 1 for 1.5-5.0 length

Adding Solids

After the AQUA WASHPRESS™ Dewatering Screw Press unit has dry run satisfactorily, solids can be added. Check that the solids can be delivered to the AQUA WASHPRESS™ Dewatering Screw Press unit. Also make certain that there is a receiving container in place for the dewatered solids.

Observe the operation until satisfied that no abnormalities will occur. Should "bridging" occur in the hopper, where the solids build up but do not fall into the path of the spiral, turn the unit off and then electrically lock the unit out observing lock out procedures. Using a rod, stick, etc., push the solids into the bottom of the hopper.

⚠ DANGER ⚠

FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.

Model	Capacity (cubic feet/hour)	Motor, (HP)	*Maximum water consumption, (GPM)	Outlet speed, (RPM)
AWP8	35	3	15	~ 14
AWP10	53	3	15	~ 14
AWP12	88	3	15	~ 14

* The maximum water flow occurs during the flushing of the trough.

Shutdown and Cleaning Procedures

When taking the AQUA WASHPRESS™ Dewatering Screw Press unit off-line for a short term shutdown period for maintenance or any other reason, follow the procedures below to save time and help prevent premature "wear" or service requirements.

The hopper(s), inlet area and inner trough should be cleared of materials by turning the AQUA WASHPRESS™ Dewatering Screw Press unit on and washing down with water. The inspection covers allow access between the inner trough and the outer trough for cleaning (see page 2-1A).

During normal operation, the AQUA WASHPRESS™ Dewatering Screw Press unit will have a solids plug in the discharge pipe creating the backpressure necessary for proper solids dewatering. For maintenance purposes or for long term shutdown or storage, the solids plug can be removed by adding crushed or cubed ice, 10 pounds at a time, to the inlet hopper and turning the unit on in the forward direction until ice begins to discharge. In cold weather, melt the ice with a mild heat source to prevent expansion damage. Do not use flame or heat sources greater than 150°F.

A steam/pressure wash is recommended for cleaning both inside and outside surfaces.

Check gearmotor's lubrication points and refill as appropriate.

CAUTION:

DO NOT APPLY HOT STEAM DIRECTLY TO PLASTIC OR RUBBER SURFACES, AS IT MAY CAUSE DAMAGE OR DEFORMATION OF THESE SURFACES.

DO NOT APPLY WATER DIRECTLY ON ELECTRICAL COMPONENTS (MOTOR, EMERGENCY STOP PUSH BUTTON, ETC.).

Emergency Shutdown Procedures

The AQUA WASHPRESS™ Dewatering Screw Press unit is equipped with Emergency Stop push buttons, mounted on the equipment and in the control panel.

Pressing either Emergency Stop push button will shut down the unit immediately.

A motor overload or motor overcurrent condition may also cause the unit to shut down, causing an emergency situation.

SECTION FIVE

AQUA WASHPRESS™ Dewatering Screw Press Unit
MAINTENANCE

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS EQUIPMENT MUST BE OPERATED AND MAINTAINED ONLY BY AUTHORIZED PERSONNEL WHO HAVE READ AND UNDERSTAND THE OPERATOR'S MANUAL, HAVE BEEN TRAINED IN ITS USE, AND FOLLOWING ANY AND ALL APPLICABLE SAFETY PROCEDURES.

THE SOLIDS FEED TO THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT MUST BE SHUT OFF OR BLOCKED BY SUITABLE MEANS.

TO PREVENT SERIOUS INJURY OR DEATH:

- **FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

Follow the maintenance schedule below to extend the lifetime of the machine.

Frequent visual inspections of the liquid/solid separation process and mechanical operation of the AQUA WASHPRESS™ Dewatering Screw Press unit should be performed on a regular basis. A visual check for proper liquid/solid separation should be conducted once per operating shift. More frequent observation may be needed, depending on the specific application.

Daily

General Visual Inspection -

Verify proper solids distribution to the feed area(s) and that no obstructions are present. Check that the solids are being transported to the solids discharge point. Inspect solids receptacle to insure that its volume is not in danger of overfilling or backing up into the discharge pipe.

Cleaning -

Rinse accumulated solids off of exterior surfaces. Clean other components as needed.

Weekly

Inspect and Flush Drain Housing -

Manually flush drain housing by turning the flush water spray on. Slow water discharge at the end of the drain hose may indicate excessive debris in outer trough. Remove the access covers on the top and sides of the outer trough. Ensure that there is no material buildup between the inner and outer troughs. Flush with a hose as necessary, directing spray into the area between the inlet area and the outer trough though holes for that purpose in the bulkhead between the inner trough and the inlet area.

Inspect Motor –

Visually check for excessive contamination or moisture build-up on the equipment and that the condensate drain holes on the drive motor are down, clear, free draining and open.

Monthly

Inspect Brush and Wear Bars -

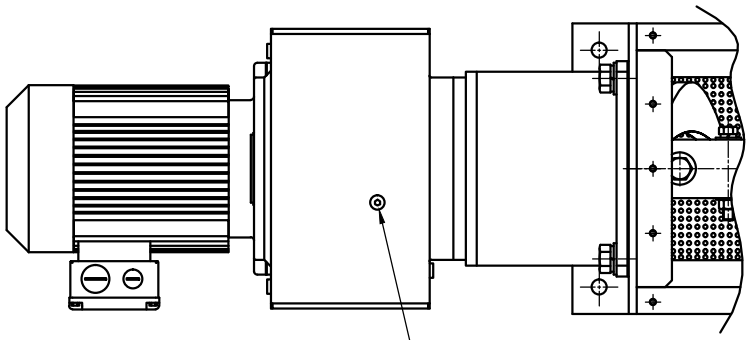
Visually check the brush in the inlet area for excessive wear. The brush is worn if the OD of the brush is within 0.06 inch of the OD of the spiral. The wear bars should be checked if the brush is worn close to the spiral OD and the brush is also close to the perforated section in the inlet area, as this is an indication of worn wear bars. Replace the wear bars if less than 0.06 inch thick (see page 8-3A).

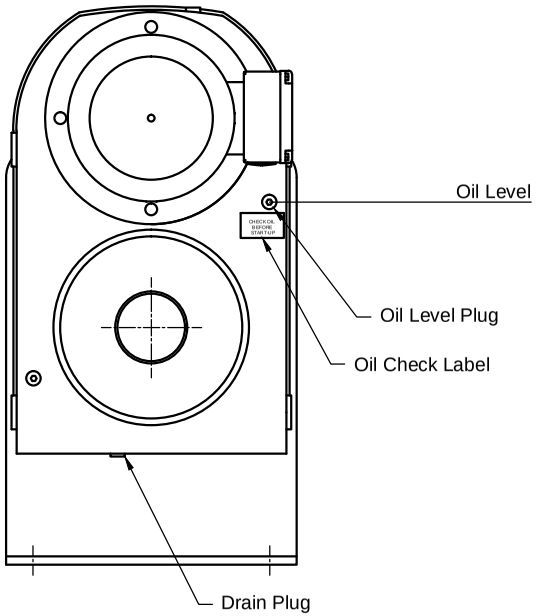
Check Gearmotor Oil Level -

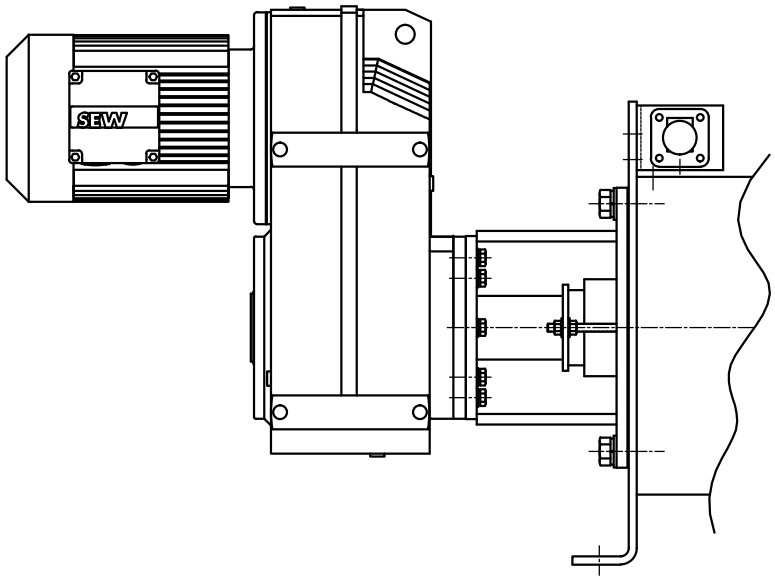
Check that the oil level in the reducer is at the bottom of the oil level plug (see page 5-2A). If necessary, add oil to bring to proper level. Reference Lubrication Chart (page 5-5) for proper lubricant. If oil is leaking from reducer, replace seals and gaskets as required.

Inspect Drain Line -

Visually inspect drain lines for cracks or signs of deterioration.







Quantity Of Oil Required

FA77	1.3 Gal
FA87	2.6 Gal
FA97	4.9 Gal

Inspect Shaft Seal Gland -

Check for any liquid leaking from the shaft seal gland. If so, and the bushing has a gap between it and the gland, tighten bolts equally to compress, if gap is completely closed, new packing material is required. (See Section Six for Replacement Procedure.)

Semi-Annually

Check Gear Reducer Output Shaft -

Check the output shaft for abnormal play. There should be no visible axial movement or eccentricity.

Check Spiral -

Visually inspect the spiral for wear or warpage. The spiral should rotate smoothly in the trough and there should be no visible major variance in the spiral pitch or length. Any sounds or signs of metal to metal contact may indicate spiral damage.

Inspect Spray Wash Solenoids -

Check operation of solenoids. Replace or repair as necessary.

Annually

Change Oil in Gearmotor -

Reference Lubrication Chart (page 5-5) for proper lubricant and oil capacity and Section Nine for further drive information.

Inspect and Clean Unit -

Flush and clean unit as required. Inspect the unit thoroughly and repair or replace damaged or worn parts as necessary.

MAINTENANCE SCHEDULE

PROCEDURE	DAILY	WEEKLY	MONTHLY	SEMI-ANNUALLY	ANNUALLY
General visual inspection.	•				
Rinse accumulated solids off of exterior surfaces.	•				
Inspect and flush drain housing.		•			
Inspect motor.		•			
Inspect brush and wear bars.			•		
Check gearmotor oil level.			•		
Inspect drain lines.			•		
Inspect shaft seal gland.			•		
Check gear reducer output shaft for abnormal play.				•	
Check spiral.				•	
Inspect electrically operated switches.				•	
Change oil in gearmotor.					•
Thoroughly inspect and clean unit.					•

LUBRICATION CHART

APPLICATION	LUBRICATION
Motor Bearings	1. Shell - Dolium R 2. Chevron – SRI No.2 3. Texaco – Premium RB
Gear Reducer KAZ87M4 Fill Quantity: 2.93 Gallon	1. ExxonMobil: Mobilgear 600 XP 220 (mineral) 14 to 104 °F 2. Shell: Omala 220 (mineral) 14 to 104 °F 3. BP: BP Energol GR-XP 220 (mineral) 14 to 104 °F 4. Texaco: Meropa 220 (mineral) 14 to 104 °F 5. ExxonMobil: Mobil SHC 630 (synthetic) -40 to 176 °F 6. Shell: Omala HD 220 (synthetic) -40 to 176 °F 7. Texaco: Pinnacle EP 220 (synthetic) -40 to 176 °F

⚠ DANGER ⚠

- **WHEN INSTALLING OR MAINTAINING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE, BE SURE THAT ANY LIFTING EQUIPMENT IS OF SUFFICIENT CAPACITY BEFORE LIFTING OR MOVING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE.**

- **DO NOT OPERATE A DAMAGED OR MALFUNCTIONING MECHANISM UNTIL NECESSARY ADJUSTMENTS OR REPAIRS HAVE BEEN MADE.**

- **DO PRACTICE GOOD HOUSEKEEPING. ALWAYS INSURE THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT IS KEPT CLEAN AND THE AREA AROUND THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT FREE OF POSSIBLE HAZARDS.**

- **ALWAYS OPERATE AND PERFORM MAINTENANCE IN A MANNER THAT PROMOTES SAFE CONDITIONS. ALWAYS USE THE PROPER TOOLS, WEAR THE PROPER CLOTHING, ETC. FOR THE TASK AT HAND.**

- **CONTACT WITH OR EXPOSURE TO MATERIAL PROCESSED OR LUBRICANTS AND OTHER FLUIDS MAY CAUSE INFECTION OR ADVERSE REACTIONS. REPORT ANY CUTS, INJURIES OR EXPOSURE TO YOUR SUPERVISOR IMMEDIATELY AND SEEK APPROPRIATE MEDICAL ATTENTION.**

- **THIS PRODUCT HAS BEEN SUPPLIED WITH WARNING LABELS, SHOULD THEY BECOME DAMAGED, REMOVED OR ILLEGIBLE, PLEASE CONTACT PARKSON FOR NO-COST REPLACEMENT LABELS.**

WARNING LABEL PART NUMBERS FOR THIS PRODUCT ARE 3824-003 AND 3824-086. SEE FIGURE ON PAGE 1-3A FOR PROPER LOCATION.

PARKSON
1401 W. CYPRESS CREEK ROAD
FORT LAUDERDALE, FL 33309-1969 · USA
PHONE: 954-974-6610
PARTS AND SERVICE: 1-888-PARKSON

SECTION SIX

AQUA WASHPRESS™ Dewatering Screw Press Unit
REPAIR AND REPLACEMENT

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

TO PREVENT SERIOUS INJURY OR DEATH:

- **FOLLOW LOCK OUT PROCEDURES BEFORE SERVICING: LOCK OUT POWER WITH PADLOCK FOR WHICH ONLY YOU HAVE THE KEY.**

Some of the following Repair and Replacement procedures require cleaning of the equipment before proceeding. Review “Shutdown and Cleaning Procedures” in Section Four, prior to proceeding.

Motor Replacement

Lockout and disconnect the electrical supply to the motor. Remove motor mounting hardware from reducer as required. Carefully lift motor from the reducer and lower to a clean dry area. Make repairs or replace as appropriate. Reinstall and rewire.

NOTE: **When replacing a motor, verify orientation of drain holes are proper to preclude trapping condensation in the motor housing.**

Gear Reducer Replacement (see page 8-3A)

Lockout and disconnect the electrical supply to the motor. Remove the bolt and washer on the outside end of the drive shaft. Remove the bolts attaching the gear reducer to thrust bearing/seal housing and pull reducer off drive shaft. Lower entire drive assembly onto a clean dry area. Make repairs to the gear reducer as appropriate. Reverse for reassembly.

NOTE: **Prior to reinstalling the gear reducer, clean the shaft and hollow bore to bright metal. Liberally coat the shaft and hollow bore with contact corrosion inhibitor paste, Parkson product part number 3259-001. Do not reassemble without protecting the shaft and hollow bore. Failure may make the gear reducer extremely difficult to remove in the future.**

Wear Bar Replacement (see pages 6-2A and 8-3A)

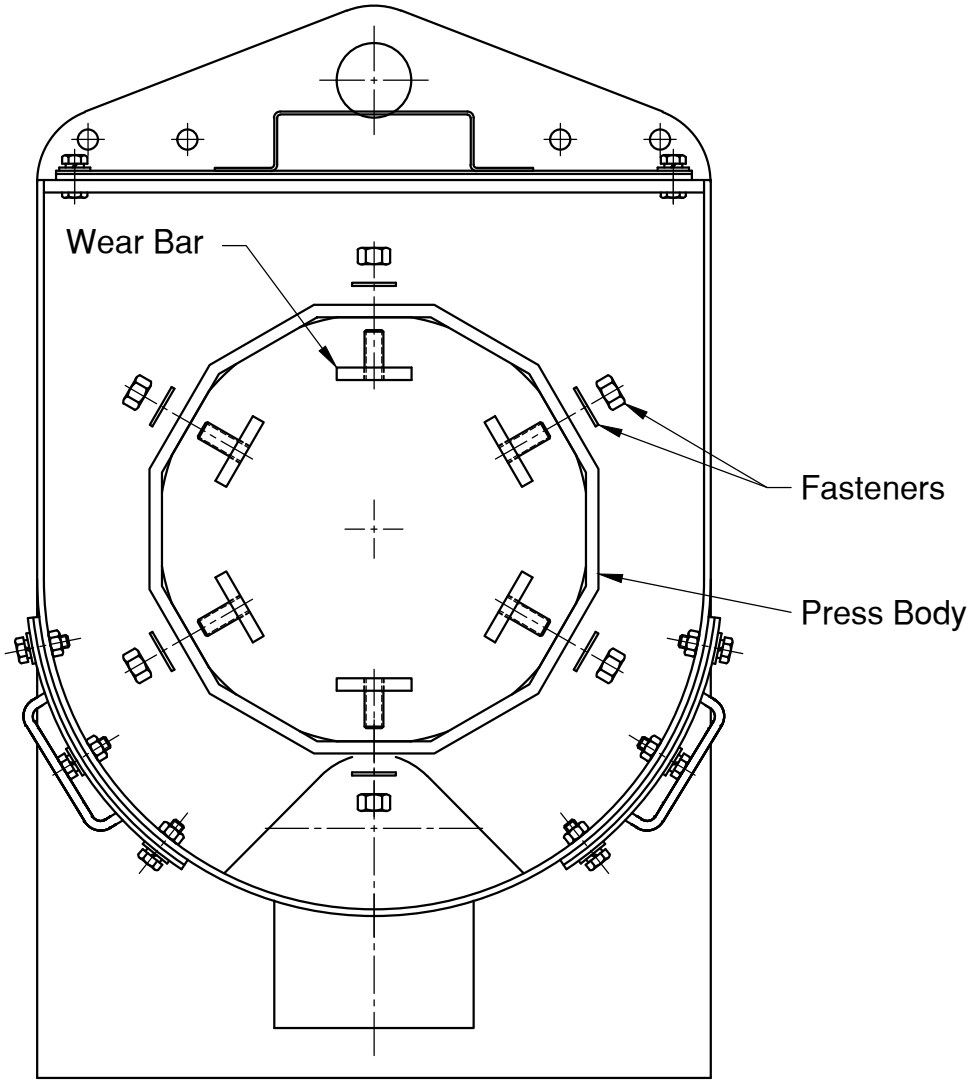
Check wear bars for wear. Replace if they are worn out (less than .06" thickness left). The wear bars are bolted through the inner trough. The wear bars can be replaced by either removing the drive assembly or by removing the discharge tube. Removing the drive assembly is the preferred method, if clearance space allows.

Drive Assembly Removal Method

1. Clear solids from the inlet area and inner trough.
2. Lockout the unit and disconnect the electrical supply to the motor.
3. Remove the inlet hopper, as necessary, to provide access to the inlet area.
4. While supporting the gear reducer and motor, remove the bolts attaching the drive end weldment to the outer trough.
5. While continuing to support the gear reducer, pull the gear reducer away from the outer trough (the spiral will follow) far enough to allow insertion of the replacement wear bars through the inlet area.
6. Remove the top and side access covers.
7. Remove the existing wear bars.
8. Install the replacement wear bars.
9. Push the spiral back into the unit and remount the gear reducer.
10. Reinstall the hopper and access covers.
11. Reconnect the electrical supply to the motor.

Discharge Tube Removal Method

1. Clear solids from the inlet area and inner trough.
2. Lockout the unit.
3. Remove the inlet hopper, as necessary, to provide access to the inlet area.
4. Remove the discharge tube (see page 4-4 for cleanout procedure).
5. Through the inlet area, remove the three (3) cross bolts connecting the spiral to the drive shaft.
6. Pull the spiral out of the unit through the discharge end.
7. Remove the top and side access covers.
8. Remove the existing wear bars.
9. Install the replacement wear bars.
10. Push the spiral back into the unit and reinstall the cross bolts.
11. Reinstall the hopper and access covers.
12. Reinstall the discharge tube.



Wear Bar Replacement

6-2A

Spiral Replacement (see page 8-3A)

The spiral can be replaced by either removing the drive assembly or by removing the discharge tube. Removing the drive assembly is the preferred method, if clearance space allows.

Drive Assembly Removal Method

1. Clear solids from the inlet area and inner trough.
2. Lockout the unit and disconnect the electrical supply to the motor.
3. Remove the inlet hopper, as necessary, to provide access to the inlet area.
4. While supporting the gear reducer and motor, remove the bolts attaching the drive end weldment to the outer trough.
5. While continuing to support the gear reducer assembly, pull the gear reducer away from the outer trough (the spiral will follow).
6. Remove the three (3) cross bolts connecting the spiral to the drive shaft.
5. Pull the old spiral from the unit and insert the replacement spiral.
6. Insert the drive shaft into the spiral and replace the three (3) cross bolts connecting the spiral to the drive shaft.
7. While continuing to supporting the gear reducer assembly, remount the drive assembly to the outer trough
8. Reinstall the hopper.
9. Reconnect the electrical supply to the motor.

Discharge Tube Removal Method

1. Clear solids from the inlet area and inner trough.
2. Lockout the unit.
3. Remove the inlet hopper, as necessary, to provide access to the inlet area.
4. Remove the discharge tube (see page 4-4 for cleanout procedure).
5. Through the inlet area, remove the three (3) cross bolts connecting the spiral to the drive shaft.
6. Pull the spiral out of the unit through the discharge end.
7. Install the replacement spiral and three (3) cross bolts.
8. Reinstall the hopper and discharge tube.

Brush Replacement (see page 8-3A)

1. Clear solids from the inlet area and inner trough.
2. Lockout the unit.
3. Remove the inlet hopper, as necessary, to provide access to the inlet area.
4. Remove all accessible nuts and clips.
5. Remove the motor fan cover and spin the fan to rotate the spiral for access to the remaining nuts and clips.

6. Grabbing the discharge free end of the brush, screw the old brush off of the spiral.
7. Using a hammer or vise, ensure that the sides of the “U” shaped brush carrier are crimped shut on what will become the drive end of the brush.
8. Thread the drive end of the replacement brush onto the spiral starting at the discharge end.
9. Spin the motor fan so that the brush attachment stud closest to the drive is up.
10. Install the first clip and nut ensuring that the clip is perpendicular to the brush, the brush carrier is in the center of the retaining portion of the clip and the brush OD is proud of the spiral OD by approximately 1/4 inch.
11. Spin the motor fan to rotate the next brush attachment stud is up and attach clip and nut. Repeat towards the discharge end, leaving the last clip until after step 12.
12. The brush will be supplied slightly too long. At the discharge end cut the brush to the required length and crimp the side of the “U” shaped brush carrier. Install the final clip and nut.
13. Reinstall the motor fan cover and hopper.

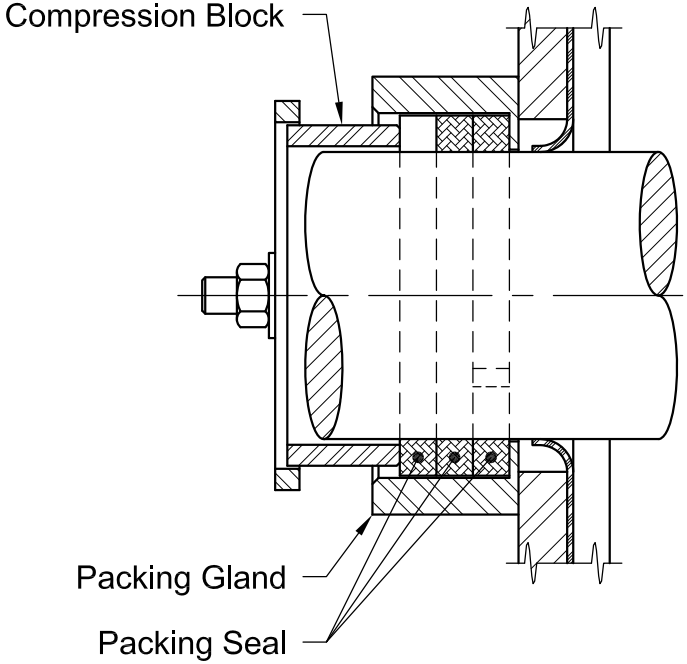
Drive Shaft Packing Seal Replacement

1. Lockout the unit.
2. Remove the two (2) nuts holding the compression block in place (see page 6-4A and 8-3A).
3. Slide the compression block toward reducer.
4. Remove the old packing material from the seal gland.
5. Observe the condition of the drive shaft in the area the packing contacts. The surface should be free of any mars or deep pits. Clean the shaft with emery paper to ensure a smooth surface, as required.
6. The packing is to be inserted as three (3) separate rings. To cut the packing to the correct size, wrap the packing tightly around the drive shaft and cut ends at a 45 degree angle so the ends mate together. This piece can be used as a template for the remaining rings.
7. Insert the first packing ring around the drive shaft and inside the seal gland. Push the packing ring in as far as possible using the compression block. Be sure the ring does not twist during installation.
8. Insert the second packing ring making sure the seam in the ring is 120 degrees away from the seam in the first ring (90 degrees minimum), pushing ring in as far as possible. Repeat for the third packing ring.
9. Reassemble compression ring with two (2) hex head cap screws and washers. Tighten nuts evenly to ensure even gap between the compression block and seal gland. Clamp the compression block in place with the opposing two (2) nuts.

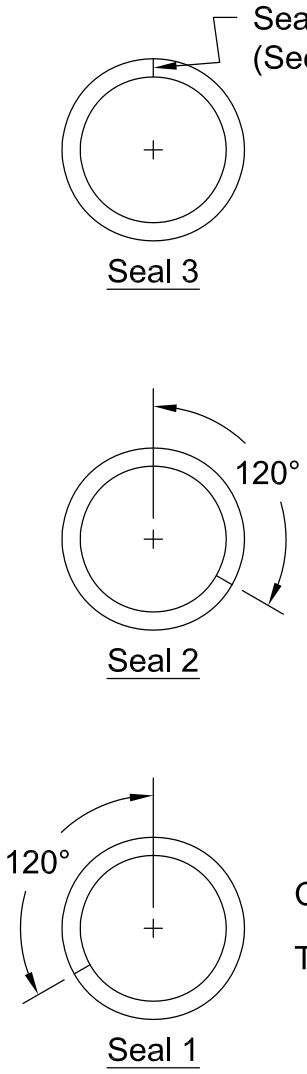
CAUTION

DO NOT OVER TIGHTEN THE NUTS. PACKING COMPRESSED TOO TIGHT WILL DAMAGE THE SHAFT.

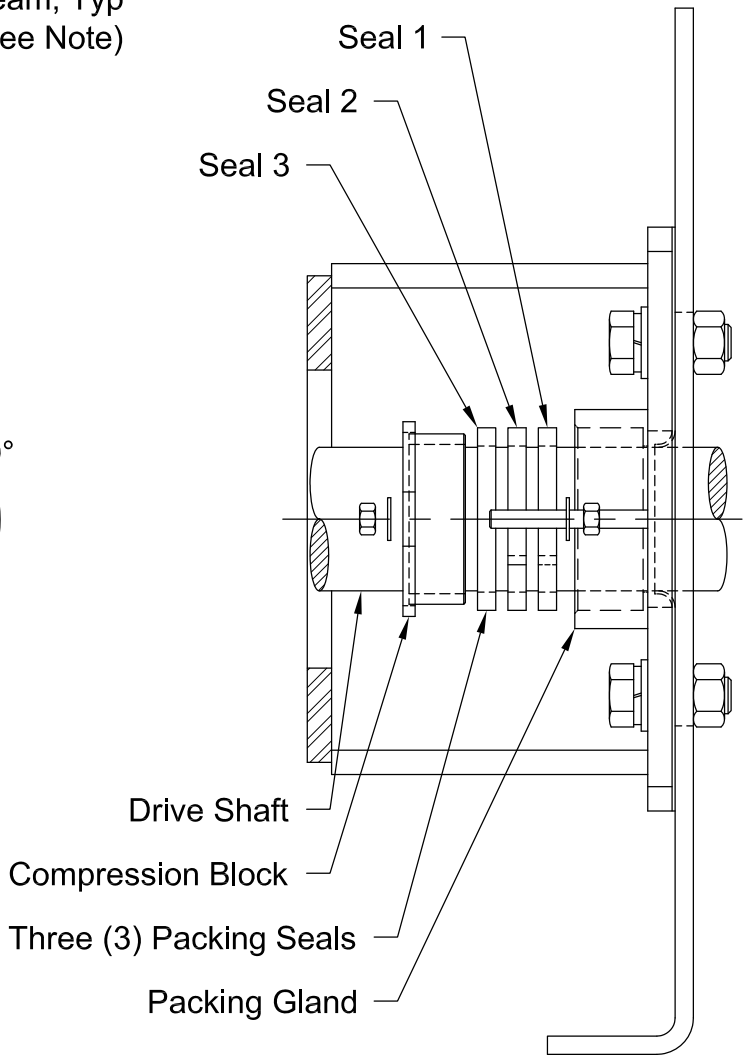
Drive Shaft Packing Seal Replacement



Assembled View



Note: Seams In Packing Seals Should Be Located Approximately As Shown.



Exploded View

⚠ DANGER ⚠

- **WHEN INSTALLING OR MAINTAINING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE, BE SURE THAT ANY LIFTING EQUIPMENT IS OF SUFFICIENT CAPACITY BEFORE LIFTING OR MOVING THE AQUA WASHPRESS™ DEWATERING SCREW PRESS UNIT OR ASSOCIATED HARDWARE.**

- **DO NOT OPERATE MACHINE WITHOUT GUARDS AND COVERS IN PLACE.**

- **MAKE SURE ANY ELECTRICAL CONNECTIONS ARE DONE BY QUALIFIED PERSONNEL AND IN ACCORDANCE WITH ALL APPLICABLE CODES AND REQUIREMENTS.**

- **DO NOT OPERATE A DAMAGED OR MALFUNCTIONING MECHANISM UNTIL NECESSARY ADJUSTMENTS OR REPAIRS HAVE BEEN MADE.**

- **OVERLOAD AND/OR SAFETY SWITCHES ARE EMERGENCY DEVICES. DO NOT USE THE OVERLOAD OR SAFETY SWITCHES TO STOP THE MECHANISM DURING NORMAL OPERATION.**

- **DISCHARGE PIPING FILLED WITH SCREENINGS WILL BE HEAVY (35-50 POUNDS PER FOOT PLUS WEIGHT OF PIPE). BE SURE THAT ANY LIFTING EQUIPMENT IS OF SUFFICIENT CAPACITY BEFORE DISCONNECTING, LIFTING OR MOVING THE DISCHARGE TUBE.**

- **CONTACT WITH OR EXPOSURE TO MATERIAL PROCESSED OR LUBRICANTS AND OTHER FLUIDS MAY CAUSE INFECTION OR ADVERSE REACTIONS. REPORT ANY CUTS, INJURIES OR EXPOSURE TO YOUR SUPERVISOR IMMEDIATELY AND SEEK APPROPRIATE MEDICAL ATTENTION.**

THIS PRODUCT HAS BEEN SUPPLIED WITH WARNING LABELS, SHOULD THEY BECOME DAMAGED, REMOVED OR ILLEGIBLE; PLEASE CONTACT PARKSON FOR NO-COST REPLACEMENT LABELS.

WARNING LABEL PART NUMBERS FOR THIS PRODUCT ARE 3824-003 AND 3824-086. SEE FIGURE ON PAGE 1-3A FOR PROPER LOCATION.

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PARTS AND SERVICE: 1-888-PARKSON

SECTION SEVEN

AQUA WASHPRESS™ Dewatering Screw Press Unit
TROUBLE-SHOOTING GUIDE

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

PROBLEM	PROBABLE CAUSE	REMEDY
SPIRAL DOES NOT TURN	No power to motor.	Check circuit breakers. Check connections.
	Current monitor O.L. turns off power.	Find obstruction or overload condition. Clear machine, restart.
	Control problems.	Check manual control. Verify that level switch working properly.
	Spiral blocked with large foreign material.	Remove foreign material.
SPIRAL TURNS ERRATICALLY	Unit overload.	Clear machine. Review system process.
	Broken gear.	Check reducer output shaft. Repair gear reducer.
OVERFLOWS DURING NORMAL OPERATION	Solids composition or flow changed.	Review system process.
	Brush worn.	Replace brush. Check wear bars at the same time.
WATER LEAKING BETWEEN FROM UNIT AT DRIVE SHAFT	Packing loose.	Tighten compression block (do not over tighten) or replace packing.

PROBLEM	PROBABLE CAUSE	REMEDY
EXCESSIVE DEWATERING OF SOLIDS	Press zone clogged.	Clean dewatering cylinder.
ABNORMAL LOUD NOISES	Gravel entered the machine.	Allow machine to clear itself.
ERRATIC OPERATIONS, VIBRATIONS	Large foreign material entered the unit.	Disassemble machine and clean as necessary.
	Extremely high solids load.	Check motor power consumption.

⚠ DANGER ⚠

THIS UNIT CONTAINS A ROTATING SPIRAL. CONTACT WITH THE SPIRAL OR ANY MOVING PART DURING OPERATION WILL CAUSE SERIOUS INJURY.

TROUBLE-SHOOTING GUIDE (cont'd.)

Motor

Since any number of reasons could be responsible for the failure, the following guide lists usual conditions that can lead to difficulties with a motor. Should there be any indication of a premature failure, care must be taken to make certain that:

1. The original motor selection was the proper one.
2. The motor was installed correctly, particularly the electrical connections.
3. The power supply was correct.
4. The motor was of the proper size (speed and horsepower) to do the job.

Verify the above conditions have been completed. Use of the following guide in pinpointing the difficulty will lead to long service life and complete satisfaction.

PROBLEM	PROBABLE CAUSE	REMEDY
MOTOR FAILS TO START	Circuit breakers tripped.	Reset breakers. Should be at least 125% of nameplate amperes.
	Overload Trips.	Check and reset overload in starter.
	Improper power supply.	Check to see that power supplied agrees with motor nameplate and load factor.
	Improper line connections.	Check connections with diagram supplied with motor.
	Open circuit in winding.	Indicated by humming sound when starter is closed. Check for loose wiring connections.
	Mechanical failure.	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator.	Indicated by blown fuses, tripped circuit breakers or heaters. Motor must be rewound.
	If 3 phase, one phase may be open.	Check lines for open phase.
	Low motor voltage.	See that nameplate voltage is maintained. Check connection.

TROUBLE-SHOOTING GUIDE (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
MOTOR RUNS AND THEN STOPS	Power failure.	Check for loose connections to line, to fuses and to control.
MOTOR DOES NOT COME UP TO SPEED	Voltage too low at motor terminals because of line drop.	Verify proper electrical wire size for power draw.
	Open primary circuit.	Locate fault with testing device and repair.
MOTOR TAKES TOO LONG TO ACCELERATE	Poor circuit.	Check for high resistance.
	Applied voltage too low.	Get power company to increase power tap.
WRONG ROTATION	Wrong sequence of phases.	Reverse any two line connections at motor or at the control panel.
MOTOR OVERHEATS WHILE RUNNING UNDER LOAD	Frame or bracket vents may be clogged with dirt and prevent proper ventilation of motor.	Open vent holes and check for a continuous stream of air from the motor.
	Ambient temperature too hot.	Provide local cooling of ambient air.
	Insufficient cooling.	Clean fan blades, motor fins and fan cover.
	Motor may have one phase open.	Check for voltage and make sure that all leads are well connected.
	Unbalanced terminal voltage.	Check for faulty leads, connections and transformers.

TROUBLE-SHOOTING GUIDE (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
MOTOR OVERHEATS WHILE RUNNING UNDER LOAD (cont'd.)	Shorted stator.	Rewind or replace stator.
	Faulty connection.	Indicated by high resistance.
	High voltage. Exceeds +10% of nameplate volts.	Check terminals of motor with a voltmeter.
	Low voltage. Exceeds -10% of nameplate volts.	Check terminals of motor with a voltmeter.
	Rotor rubs stator bore.	If not poor machining on brackets, replace worn bearings.
MOTOR VIBRATES AFTER CORRECTIONS HAVE BEEN MADE	Motor misaligned.	Realign.
	Loose at flange.	Tighten bolts.
	Coupling out of balance.	Balance coupling.
	Defective bearing.	Replace bearing.
	Bearings not in line.	Line up properly.
	Excessive end play.	Adjust bearing or add washer.
UNBALANCED LINE CURRENT ON POLY-PHASE MOTORS DURING NORMAL OPERATION	Unequal terminal volts.	Check leads and connections.
SCRAPING NOISE	Fan rubbing.	Remove interference.
NOISY OPERATIONS	Air gap not uniform.	Check and correct bracket or bearing.
	Rotor unbalance.	Rebalance.

TROUBLE-SHOOTING GUIDE (cont'd.)

PROBLEM	PROBABLE CAUSE	REMEDY
HOT BEARINGS GENERAL	Insufficient grease.	Replace bearings.
	Deterioration of grease or lubricant contaminated.	Replace bearings.
	Overloaded bearing.	Check alignment, side & end thrust.
	Badly worn bearing.	Replace bearing.
	Broken ball or rough races.	Replace bearing, first clean housing thoroughly.
	Bent or sprung shaft.	Straighten or replace shaft.
	Misalignment.	Correct by alignment of drive.

SECTION EIGHT

AQUA WASHPRESS™ Dewatering Screw Press Unit
REPLACEMENT PARTS

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

THIS PRODUCT HAS BEEN SUPPLIED WITH WARNING LABELS, SHOULD THEY BECOME DAMAGED, REMOVED OR ILLEGIBLE; PLEASE CONTACT PARKSON FOR NO-COST REPLACEMENT LABELS.

Replacement parts can be ordered either through your Parkson Products Representative or by contacting the Parkson Products Parts Coordinator toll free at **1-888-PARKSON.**

Please have the unit's project number, serial number and model number as shown on the front cover, available. This will ensure the accuracy of the part identification.

Accurate part identification will be verified prior to processing your order.

Parts List

Aqua WashPress Unit
Model AWP8-2.0

NOTE: **Please give the project number (P04300832), serial number (P0430083207) and model number (AWP8-2.0) when ordering replacement parts. This will ensure accurate part identification. Reference drawing on page 8-3A.**

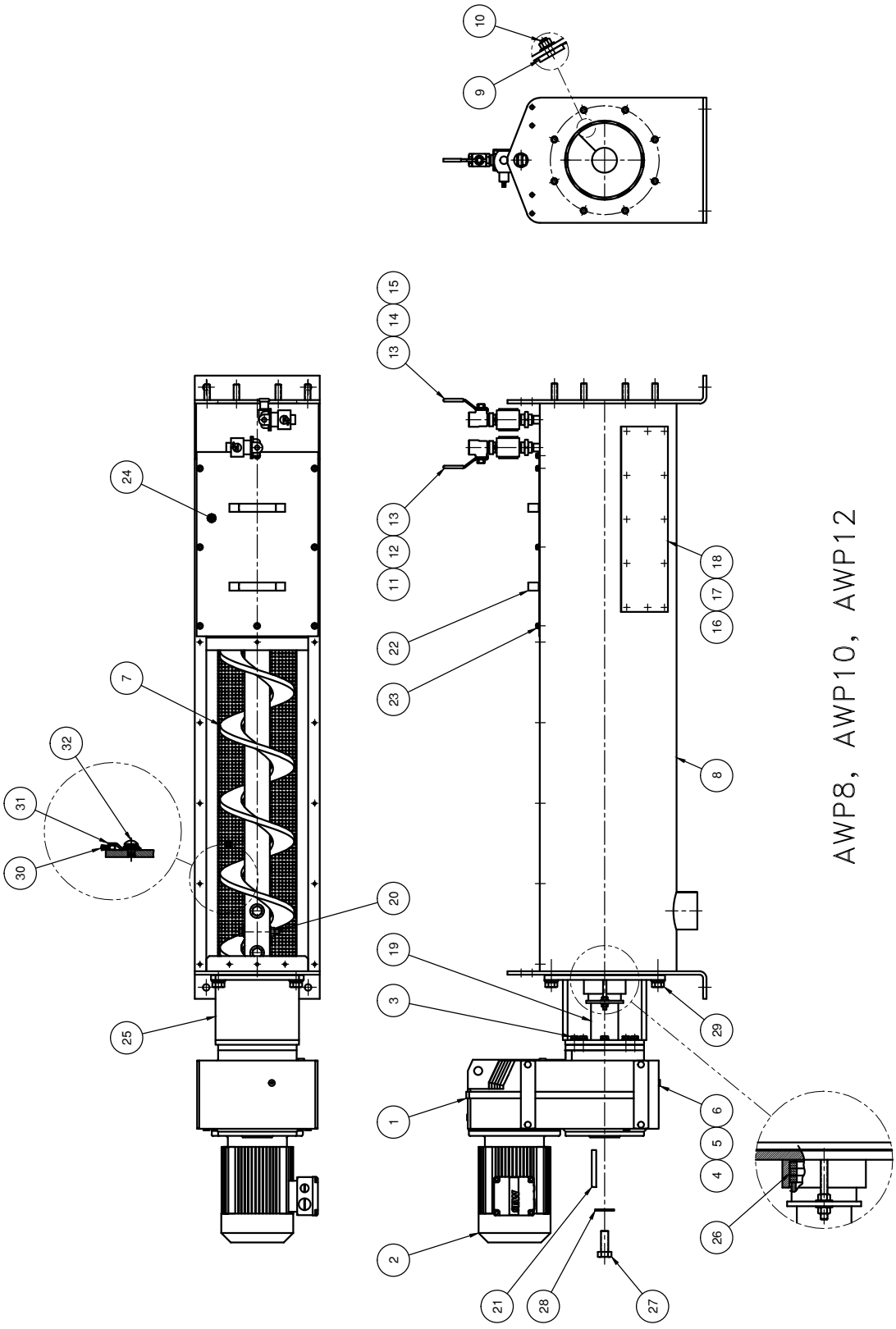
Position	Description	Qty	Part Number
1 & 2	Gearmotor, 3 HP FAZ87	1	1030091-M1
3	Bolt, M16x55	6	1011601
4	Flat washer, M16	6	0010058
5	Lock washer, M16	6	0008174
7	Spiral	1	1011520-2.0
8	Press body, complete with wear bars and covers	1	1011521-2.0
9	Wear bars	6	1011528
10	Nut, 3/8-16	34	0000891
11	Flat washer, 3/8	34	0001156
12	1/2” NPT solenoid valve	2	3076-004
13	1/2” NPT ball valve	2	3013-051
14	1/2” NPT union	2	3437-001
15	1/2" NPT close nipple	4	3078-007
16	Side access cover	2	1011529
17	Side access cover gasket	2	1011530
19	Drive shaft	1	1011519
20	Bolt, 5/8-11x4	3	1011597
23	Nut, Lock 5/8-11	3	1011598
24	Top access cover	1	1011532
25	Top access cover gasket	1	1011533
26	Packing, 3/8 x 38	1	1011574
27	Drive end weldment	1	1011515
28	Compression block	1	1011516
29	Bolt, 3/4-10x2	4	0006167
30	Flat washer, 3/4	4	0000691
31	Lock washer, 3/4	4	0006164
32	Drive end gasket	1	1011517
33	Bolt, M20x50	1	1030048
34	Flat washer, heavy, M20	1	1030049
35	Key, 18x11x100	1	1030050
36	Brush	1	1030053-2.0
37	Brush clip	15	1030051
38	Nut, acorn, 3/8-16	15	1030052
40	Bolt, 1/4-20x3/4	28	0000102
41	Flat washer, 1/4	28	0000687
42	Lock washer, 1/4	28	0000754

Replacement Parts List

Aqua WashPress Unit
Model AWP8-2.0

NOTE: **Please give the project number (P04300832), serial number (P0430083207) and model number (AWP8-2.0) when ordering replacement parts. This will ensure accurate part identification. Reference drawing on page 8-3A.**

Position	Description	Qty	Part Number
9-11	Wear bar kit, with fasteners	1	1011652
26	Packing, 3/8 x 38	1	1011574
36	Brush	1	1030053-2.0
37	Brush clip	15	1030051
38	Nut, acorn, 3/8-16	15	1030052


AWP8, AWP10, AWP12

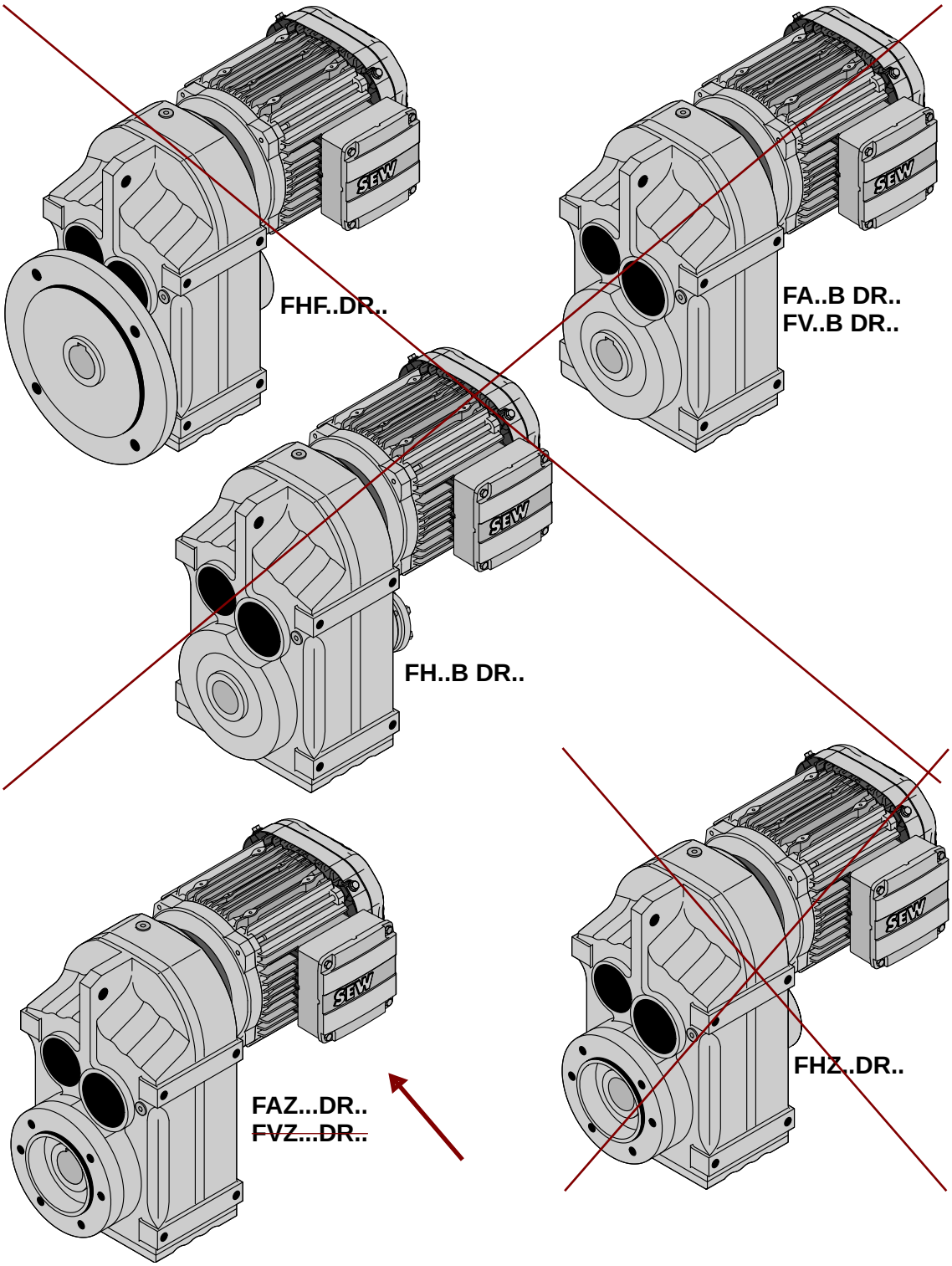
SECTION NINE

AQUA WASHPRESS™ Dewatering Screw Press Unit
COMPONENT DATA

⚠ DANGER ⚠

REVIEW ALL SAFETY PRACTICES LISTED IN SECTION ONE BEFORE PROCEEDING.

Drive System Data


FHF..DR..
FA..B DR..
FV..B DR..
FH..B DR..
FAZ...DR..
~~FVZ...DR..~~
FHZ..DR..
60410AXX

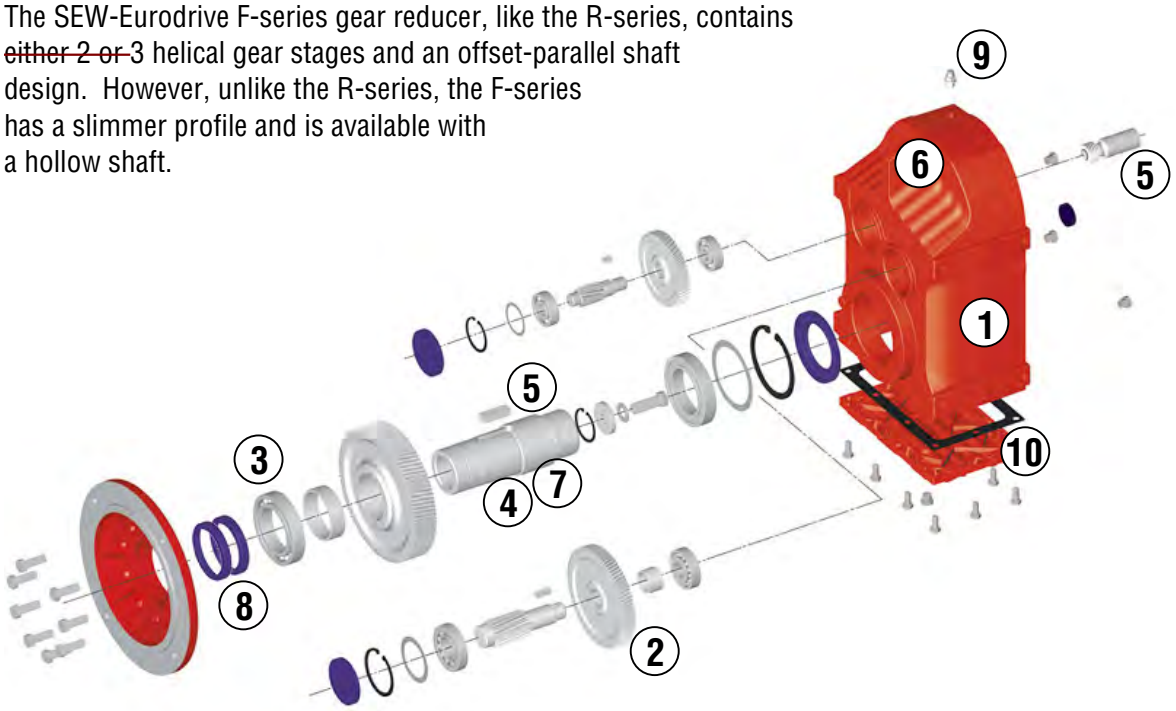
Technical Note

F-Series Gear Reducer - theSnuggler®

F-Series

Features

The SEW-Eurodrive F-series gear reducer, like the R-series, contains ~~either 2 or~~ 3 helical gear stages and an offset-parallel shaft design. However, unlike the R-series, the F-series has a slimmer profile and is available with a hollow shaft.



1. SAE Class 30 or equivalent (GG20) gray cast iron housing and flanges on sizes F37-F157. No bolt-on bearing covers
2. Finish ground or shaved steel gears heat treated and hardened to 58-62 Rockwell C
3. ABEC-1 bearing tolerances
4. SAE 1045 steel shafts
5. Captured keys on input and output shafts
6. Corrugated surface improves heat dissipation and reduces vibration
7. Input and output shafts available in either inch or metric sizes. Solid shafts contain a center-tapped hole to ease the mounting of components onto the shaft.
8. Exclusive **interlocking** 2-piece seal design consisting of a patented bi-helix Viton® inner seal and a double-lip Nitrile (Buna N) outer seal to provide three sealing surfaces against contaminants (not available on F27/F37)
9. Oil level and breather plugs strategically placed according to the customer's mounting position
10. Removable inspection cover

Additional Features:

- **Style**: Parallel shaft orientation (motor shaft is parallel to output shaft) in ~~either 2 or~~ 3 gear stages
- **Flange**: Contains O-ring to minimize oil leakage that may result from mounting to a "flat" surface that exceeds acceptable tolerances. Also contains a centering tenon (pilot) and is available with either through holes (B5) or tapped holes (B14).
- **Input Types**: Available with adapters to accommodate NEMA or IEC motor frames, solid input shafts, backstops, adjustable motor mounting platforms, and scoops. Also accepts an R-series reducer as the input (ex: FAF67R37) to attain higher ratios and lower output speeds
- **Output Shaft – Keyed**: Metric or inch shaft available in hollow or solid designs. Keyed hollow shaft supplied with special mounting paste and a retaining kit. Paste protects against corrosion as is available in regular or food grade. Retaining kit secures customer's solid shaft and contains bolt, washer, and protective cap.
- **Output Shaft – Keyless**: Available as a metric shrink disc, an inch tapered bushing (TorqLOC™), or a DIN 5480 spline
- **Mounting**: Available as foot (rail), flange, or shaft mount
- **Torque Ratings**: Based upon mechanical capacity under continuous duty operation
- **Torque Capacity**: From 930 lb-in to 159,300 lb-in
- **Shaft Rotation**: Unrestricted - clockwise or counterclockwise
- **Efficiency**: ~~97% (2-stage),~~ 95.5% (3-stage) - 1.5% efficiency loss per gear stage
- **Ratio Range – Single**: 3.77 to 281.71
- **Ratio Range – Compound**: 134 to 29,211
- **Fatigue Strength**: Shafts and gears designed for infinite fatigue strength
- **Shock Capacity**: Meets or exceeds AGMA 6009-A00, which states that reducer must be capable of withstanding 4 shock loads within an 8-hour period – each shock equal to 200% of the maximum rated torque for 2 seconds.

Housing Material

Except for the F27, all SEW F-series gear reducers are manufactured from SAE 30 or equivalent (GG20) gray cast iron due to the following benefits:

- Cast iron flows well, allowing it to be used on intricate castings.
- Cast iron machines well.
- Cast iron serves as an excellent damping material to minimize vibration, contributing to longer bearing life and longer gear life.

Ductile iron (or nodular iron), a type of cast iron containing magnesium, is 2 to 4 times stiffer than gray cast iron. It is often used in applications involving heavy shock loads at low temperatures – when gray iron housings lose much of their shock absorbing strength.

Ductile iron housings are not available on F-series reducers.

~~Optional~~ Bearings

Some F-series reducers are available with optional heavy-duty bearings as listed below. Heavy-duty bearings increase the axial and overhung load capacity and are standard on SEW Screw Conveyor Drives. For more information, contact SEW Regional Engineering.

Unit	Output Bearings	
	Standard	Optional
~~FA / FAF / FAZ 67~~	~~Ball~~	~~Taper Roller~~
~~FA / FAF / FAZ 77~~	~~Ball~~	~~Taper Roller~~
FA / FAF / FAZ 87	~~Ball~~	Taper Roller
~~FA / FAF / FAZ 97~~	~~Ball~~	~~Taper Roller~~
~~FA107~~	~~Ball~~	~~Taper Roller~~
~~FA127~~	~~Ball~~	~~Taper Roller~~

Note: Heavy-duty bearing option is only available with a metric hollow shaft.

Introduction

The SEW-Eurodrive theSNUGGLER® Helical Gear Units are designed for continuous duty under difficult operating conditions. Only materials of the highest quality are used in the manufacture of the units. These units have the following standard construction features:

- Helical gearing in compliance with ANSI/AGMA Standard 2001-B88.
- Gears are carburized to a hardness of 58 - 62 R_C for durability.
- Gearcase and flanges of high strength gray cast iron SAE Class 30.
- Double-lip oil seals on output shaft with additional inner seal made of Viton®.
- Captured keys on input shafts.
- Foot mounted, flange mounted, foot/flange mounted, shaft mounted, flange mounted with hollowshaft, or shaft/flange/foot mounted.
- Integral torque arm.

Efficiency

The efficiency of the gear units is primarily determined by the gearing and bearing friction, and ranges from approximately 95% for 3 stages of gear reduction ~~to 97% for 2 stages of gear reduction.~~

Output Power, Torque, and Speed

The details on power, torque, and speed given in the selection tables always refer to the mounting position H1 or similar mounting position for standard features, standard ambient conditions, and standard lubricants. The output speeds have been rounded up or down. The actual output speed may vary slightly due to the motor frame size, the loading, or the supply voltage.

Design Variations

Additional features available for theSNUGGLER® Gear Units are:

- ~~Adapters for IEC or NEMA C-Face motors.~~
- ~~Motor mounting platforms and scoops.~~
- ~~Adapters for torque limiting couplings.~~
- Corrosion protection.
- ~~Shrink disc shaft mounting~~

Please contact your SEW-Eurodrive representative for additional information.

Abbreviations

The following abbreviations are used in the selection tables:

f_B	Service Factor
F_{Ra}	Permissible output overhung load (lb) at the midpoint of the output shaft extension
F_{Re}	Permissible input overhung load (lb) at the midpoint of the input shaft extension
i	Gear unit ratio
n_a	Output speed in rpm
n_e	Input speed in rpm
P_a	Rated output power (HP)
P_e	Calculated power input into the gear unit (HP) P_e is calculated from $T_{a\ max}$ by taking into account the gear units' efficiency under standard operating conditions. For calculated P_e less than .2HP, a dash (—) is shown in the respective selection tables since the actual values are subject to large variations.
P_n	Motor rated power (HP)
T_a	Output torque (lb-in.) with reference to the driving motor
$T_{a\ max}$	Maximum permissible output torque (lb-in.) at $f_B = 1.0$

Dimension Page Notes

The dimension sheets are valid for standard units with various basic features. In particular, motor accessories such as canopies, ventilators, etc. will alter the basic dimensions. Please refer to the respective accessory dimension pages for additional dimensions.

Motors from frame size DV112 are supplied with lifting eye bolts which can be removed. Smaller motors do not have lifting eye bolts.

Certified dimension sheets are available from your SEW-Eurodrive Assembly Center.

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SEW-Eurodrive gear units may be service factored using criteria set forth in the various AGMA Standards.

For: a) Parallel Helical (type R and F) gearmotors.
b) Right angle Helical-Bevel (type K) gearmotors.

AGMA uses service classes I, II, and III, which are based on:

Class I: Steady loads not exceeding normal rating and 8-10 hours running time per day.
Service Factor 1.0 minimum

Class II: a. Steady loads not exceeding normal rating and 24 hours running time per day.
b. Moderate shock loads, not exceeding 1.25 × Rated Load Torque and 8-10 hours running time per day.
Service Factor 1.4 minimum

Class III: a. Moderate shock loads, 1.25 × Rated Load Torque and 24 hours running time per day.
b. Heavy shock loads, exceeding 1.25 × Rated Load Torque and 8-10 hours running time per day.
Service Factor 2.0 minimum

Reference AGMA Standard 6019-E89 for Service Class listings by application.

AGMA uses service factors for electric motors, turbines, and hydraulic motors as listed by the chart below.

In the chart, the reducer loading may be classified as follows:

(1) Uniform Load. Recurrent shock loads do not exceed the nominal specified input or prime mover power.

(2) Moderate Shock Load. Recurrent shock loads do not exceed 1.25 × the nominal specified input or prime mover power.

(3) Heavy Shock Load. Recurrent shock loads do not exceed 1.50 × the nominal specified input or prime mover power.

(4) Extreme Shock Load. Recurrent shock loads do not exceed 1.75 × the nominal specified input or prime mover power.

NOTE: The magnitude of any recurrent shock loads should be estimated or determined through test by the system designer. Recurrent shock loads can be of such a short duration that they may not be reflected in motor amperage readings. In these cases actual loads are usually determined by strain gaging the driven shaft of the machine.

Duration of Service (Hours per Day)	Uniform Load	Moderate Shock	Heavy Shock	Extreme Shock
Occasional .5 hour	—	—	1.00	1.25
Less than 3 hours	1.00	1.00	1.25	1.50
3-10 hours	1.00	1.25	1.50	1.75
Over 10 hours	1.25	1.50	1.75	2.00

When the prime mover is a single or multi-cylinder engine, the service factors must be modified by the following:

Steam and Gas Turbines, Hydraulic or Electric Motor	Single Cylinder Engines	Multi-Cylinder Engines
1.00	1.50	1.25
1.25	1.75	1.50
1.50	2.00	1.75
1.75	2.25	2.00
2.00	2.50	2.25
2.25	2.75	2.50
2.50	3.00	2.75
2.75	3.25	3.00
3.00	3.50	3.25

Starting conditions where peak loads exceed 200% of rated load and applications with frequent starts and stops require special load analysis.

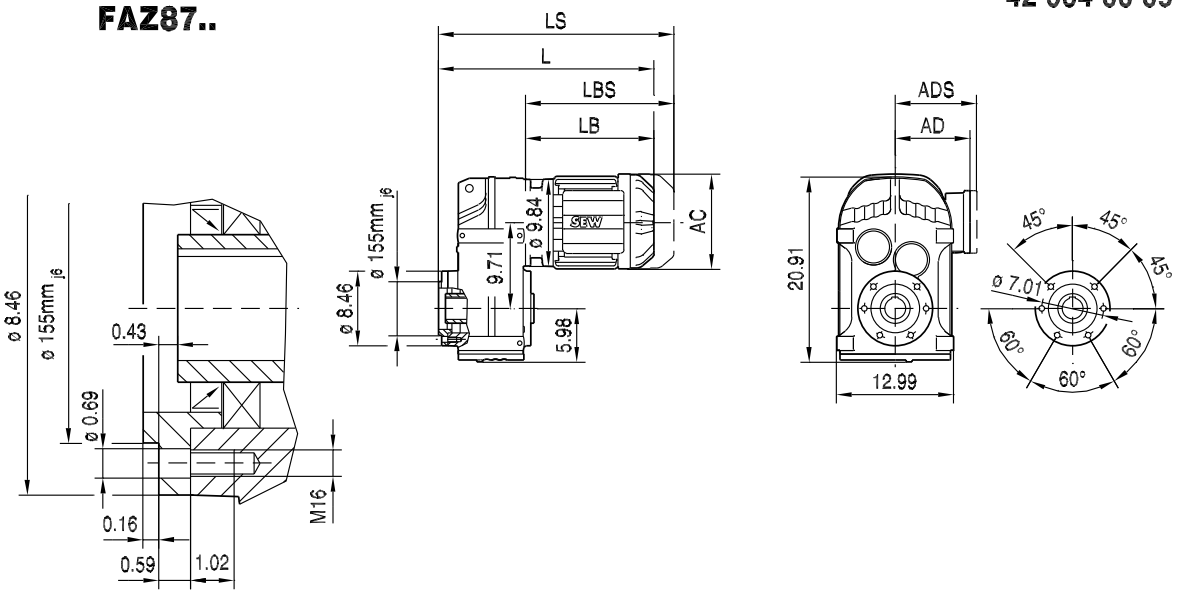
Service Factor listings by application may be found in:

AGMA 6010-E88 for types R, F and K reducers.
AGMA 6034-B92 for type S reducers and gearmotors.

P_m [HP]	n_a [rpm]	T_a [lb-in]	i	F_{Ra} [1)] [lb]	SEW f_B					m [lbs]	
3.0	6.3	29600	276.77	7300	1.30						
	6.8	27100	253.41	7450	1.40						
	7.8	23900	223.88	7630	1.60	FA	97	DRE	100L4	400	393
	9.1	20300	189.92	7820	1.85	FAF	97	DRE	100L4	450	392
	9.9	18700	174.87	7900	2.0	F	97	DRE	100L4	420	391
	11	16700	156.30	8000	2.3	FF	97	DRE	100L4	490	392
	12	15000	140.71	8070	2.5						
	14	13600	127.42	8130	2.8						
	7.6	24500	228.93	5350	1.10						
	8.8	21100	197.20	5660	1.25						
	9.6	19200	179.97	5820	1.40	FA	87	DRE	100L4	260	388
	11	17000	159.61	5990	1.55	FAF	87	DRE	100L4	290	387
	13	14300	134.16	6180	1.85	F	87	DRE	100L4	275	386
→	14	13200	123.29	6260	2.0	FF	87	DRE	100L4	310	387
	16	11700	109.49	6350	2.3						
	18	10400	97.89	6310	2.5						
	20	9420	88.01	6160	2.8						
	15	12200	114.45	3700	1.10						
	16	11600	108.46*	3790	1.15						
	18	10100	94.93	3970	1.30						
	20	9160	85.52	4080	1.45	FA	77	DRE	100L4	175	383
	23	8030	75.02	4190	1.65	FAF	77	DRE	100L4	190	382
	24	7760	72.50	4210	1.70	F	77	DRE	100L4	180	381
	26	7110	66.46	4260	1.85	FF	77	DRE	100L4	205	382
	30	6240	58.32	4330	2.1						
	31	5920	55.27	4350	2.2						
	36	5180	48.37	4390	2.6						
	40	4660	43.58	4410	2.8						
	47	3910	36.58	4450	2.5	FA	77	DRE	100L4	170	383
						FAF	77	DRE	100L4	185	382
						F	77	DRE	100L4	180	381
						FF	77	DRE	100L4	205	382
	26	7240	67.65	2320	1.00						
	28	6540	61.07	2470	1.10						
	32	5750	53.73	2610	1.25	FA	67	DRE	100L4	125	378
	34	5430	50.74	2660	1.35	FAF	67	DRE	100L4	135	377
	40	4620	43.20	2760	1.55	F	67	DRE	100L4	130	376
	44	4200	39.26	2810	1.65	FF	67	DRE	100L4	145	377
	51	3640	34.01	2870	1.80						
	54	3430	32.08	2890	2.1	FA	67	DRE	100L4	120	378
	63	2930	27.41	2920	2.5	FAF	67	DRE	100L4	135	377
	69	2690	25.13	2920	2.7	F	67	DRE	100L4	125	376
						FF	67	DRE	100L4	140	377
	39	4790	44.73	1940	1.10	FA	57	DRE	100L4	115	373
	45	4090	38.21	1910	1.30	FAF	57	DRE	100L4	125	372
	48	3830	35.79	1890	1.40	F	57	DRE	100L4	115	371
	58	3220	30.15	1850	1.60	FF	57	DRE	100L4	130	372
	70	2670	24.96	1790	1.90	FA	57	DRE	100L4	115	373
	82	2260	21.17	1730	2.3	FAF	57	DRE	100L4	125	372
	91	2040	19.11	1700	2.6	F	57	DRE	100L4	115	371
	103	1800	16.81	1650	3.0	FF	57	DRE	100L4	130	372
	60	3090	28.88	1250	1.15	FA	47	DRE	100L4	98	368
						FAF	47	DRE	100L4	105	367
						F	47	DRE	100L4	100	366
						FF	47	DRE	100L4	105	367
	67	2750	25.72	1240	1.30						
	80	2330	21.82	1220	1.50						
	88	2110	19.70	1200	1.70	FA	47	DRE	100L4	96	368
	100	1850	17.33	1180	1.90	FAF	47	DRE	100L4	100	367
	106	1750	16.36	1170	2.0	F	47	DRE	100L4	98	366
	125	1490	13.93	1140	2.4	FF	47	DRE	100L4	105	367
	137	1350	12.66	1120	2.6						

42 064 00 09

FAZ87..



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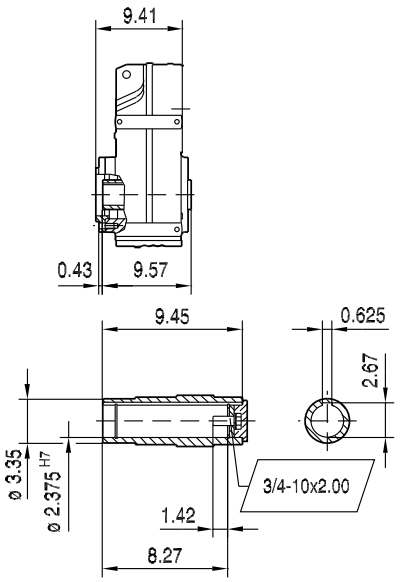

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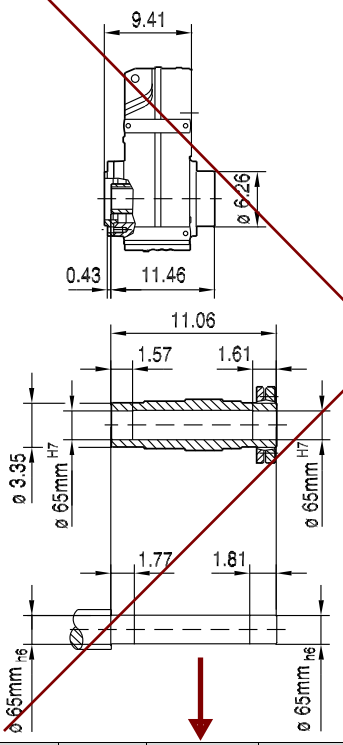

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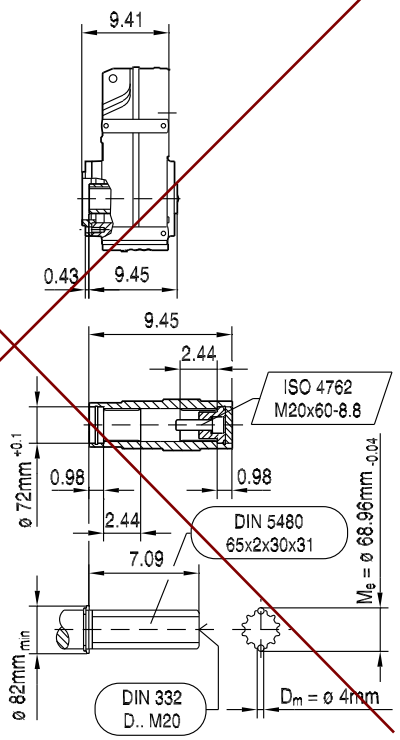


(→ 125)	DR80S	DR80M	DR90M	DR90L	DR100M	DR100L/LC	DR132S	DR132M/MC	DR160..	DR180S/M	DR180L/LC
AC	6.14	6.14	7.05	7.05	7.76	7.76	8.70	8.70	10.63	12.44	12.44
AD	5.04	5.04	5.51	5.51	6.18	6.18	6.69	6.69	8.98	9.96	9.96
ADS	5.47	5.47	5.91	5.91	6.22	6.22	6.77	6.77	8.98	9.96	9.96
L	17.99	19.21	19.29	20.08	21.26	22.44	24.13	26.10	27.72	30.43	32.80
LS	21.18	22.40	22.95	23.74	24.92	26.10	28.54	30.51	33.11	37.87	40.24
LB	8.58	9.80	9.88	10.67	11.85	13.03	14.72	16.69	18.31	21.02	23.39
LBS	11.77	12.99	13.54	14.33	15.51	16.69	19.13	21.10	23.70	28.46	30.83

SEW EURODRIVE

Catalog

AC Motors

DRS, DRE, DRP 71 – 315
DT56, DR63, DVE 250/280

Edition 01/2010

16827120 US

5 DR Series AC Motors/Brakemotors

5.1 Notes on the data of energy-efficient motors

The following table lists the short symbols used in the "Technical Data" tables.

P_N	Rated power
T_N	Rated torque
n_N	Rated speed
I_N	Rated current
$\cos\varphi$	Power factor
$\eta_{100\%}$	Efficiency at 100% of the rated power
I_A/I_N	Starting current ratio
T_A/T_N	Starting torque ratio
T_H/T_N	Ramp-up torque ratio
Code Letter	NEMA code letter
J_{Mot}	Mass moment of inertia of the motor
~~J_{Mot_BE}~~	~~Mass moment of inertia of the brakemotor~~
~~BE..~~	~~Standard brake size~~
~~Z_0 BG~~	~~Switching frequency for operation with BG brake controller~~
~~Z_0 BGE~~	~~Switching frequency for operation with BGE brake controller~~
~~T_B~~	~~Standard brake torque~~
m	Mass of the motor
~~$m_{\_BE}$~~	~~Mass of the brakemotor~~

5.5 Technical data of 4-pole premium efficiency motors

1800 rpm - S1

Motor type	P_N T_N [HP] [lb-in]	n_N [rpm]	I_N 230V [A]	I_N 460V [A]	I_N 575V [A]	cosφ	$\eta_{100\%}$ [%][1]	I_A/I_N	T_A/T_N T_H/T_N	Code Letter	J_{Mot} [10^{-3} lb-ft^2]	m [lb][2]
~~DRP90M4~~	~~1~~ ~~36.3~~	~~1750~~	~~2.9~~	~~1.46~~	~~1.17~~	~~0.76~~	~~85.5~~	~~7.8~~	~~3.6~~ ~~3.2~~	~~L~~	~~84.3~~	~~40.5~~
~~DRP90L4~~	~~1.5~~ ~~53.1~~	~~1740~~	~~4.15~~	~~2.05~~	~~1.66~~	~~0.77~~	~~86.5~~	~~7.7~~	~~3.5~~ ~~2.8~~	~~K~~	~~103~~	~~47.4~~
~~DRP90L4~~	~~2~~ ~~72.6~~	~~1740~~	~~5.7~~	~~2.85~~	~~2.25~~	~~0.77~~	~~86.5~~	~~7.5~~	~~3.4~~ ~~3.0~~	~~K~~	~~103~~	~~47.4~~
DRP112M4	3 105	1765	7.5	3.75	3	0.82	89.5	8.6	2.5 1.9	K	346	91.5
~~DRP132S4~~	~~5~~ ~~177~~	~~1765~~	~~12.4~~	~~6.2~~	~~4.95~~	~~0.83~~	~~90.2~~	~~8.6~~	~~2.4~~ ~~2.1~~	~~K~~	~~451~~	~~102~~
~~DRP160S4~~	~~7.5~~ ~~261~~	~~1775~~	~~18.5~~	~~9.3~~	~~7.4~~	~~0.81~~	~~91.7~~	~~8.9~~	~~3.4~~ ~~2.5~~	~~K~~	~~878~~	~~176~~
~~DRP160S4~~	~~10~~ ~~358~~	~~1770~~	~~25~~	~~12.6~~	~~10.1~~	~~0.82~~	~~91.7~~	~~8.1~~	~~3.1~~ ~~2.3~~	~~K~~	~~878~~	~~176~~
~~DRP160M4~~	~~12.5~~ ~~438~~	~~1770~~	~~30.5~~	~~15.4~~	~~12.3~~	~~0.82~~	~~91.7~~	~~8.2~~	~~3.5~~ ~~2.6~~	~~K~~	~~1068~~	~~196~~
~~DRP160MC4~~	~~15~~ ~~522~~	~~1780~~	~~37~~	~~18.4~~	~~14.7~~	~~0.81~~	~~92.4~~	~~8.9~~	~~3.3~~ ~~2.5~~	~~K~~	~~1401~~	~~207~~
~~DRP180M4~~	~~20~~ ~~717~~	~~1775~~	~~47~~	~~23.5~~	~~18.8~~	~~0.86~~	~~93.0~~	~~7.9~~	~~2.9~~ ~~2.1~~	~~J~~	~~2636~~	~~304~~
~~DRP180L4~~	~~25~~ ~~885~~	~~1775~~	~~58~~	~~29~~	~~23.5~~	~~0.85~~	~~93.6~~	~~8.2~~	~~3~~ ~~2.4~~	~~J~~	~~3087~~	~~335~~
~~DRP180LC4~~	~~30~~ ~~1044~~	~~1780~~	~~69~~	~~34.5~~	~~27.5~~	~~0.86~~	~~93.6~~	~~8.8~~	~~3.2~~ ~~2.6~~	~~K~~	~~3990~~	~~355~~
~~DRP225S4~~	~~40~~ ~~1425~~	~~1782~~	~~95~~	~~47.5~~	~~38~~	~~0.84~~	~~94.1~~	~~8.3~~	~~3.3~~ ~~2.5~~	~~J~~	~~6958~~	~~639~~
~~DRP225M4~~	~~50~~ ~~1752~~	~~1783~~	~~118~~	~~59~~	~~47~~	~~0.84~~	~~94.5~~	~~8.6~~	~~3.4~~ ~~2.4~~	~~K~~	~~8146~~	~~694~~

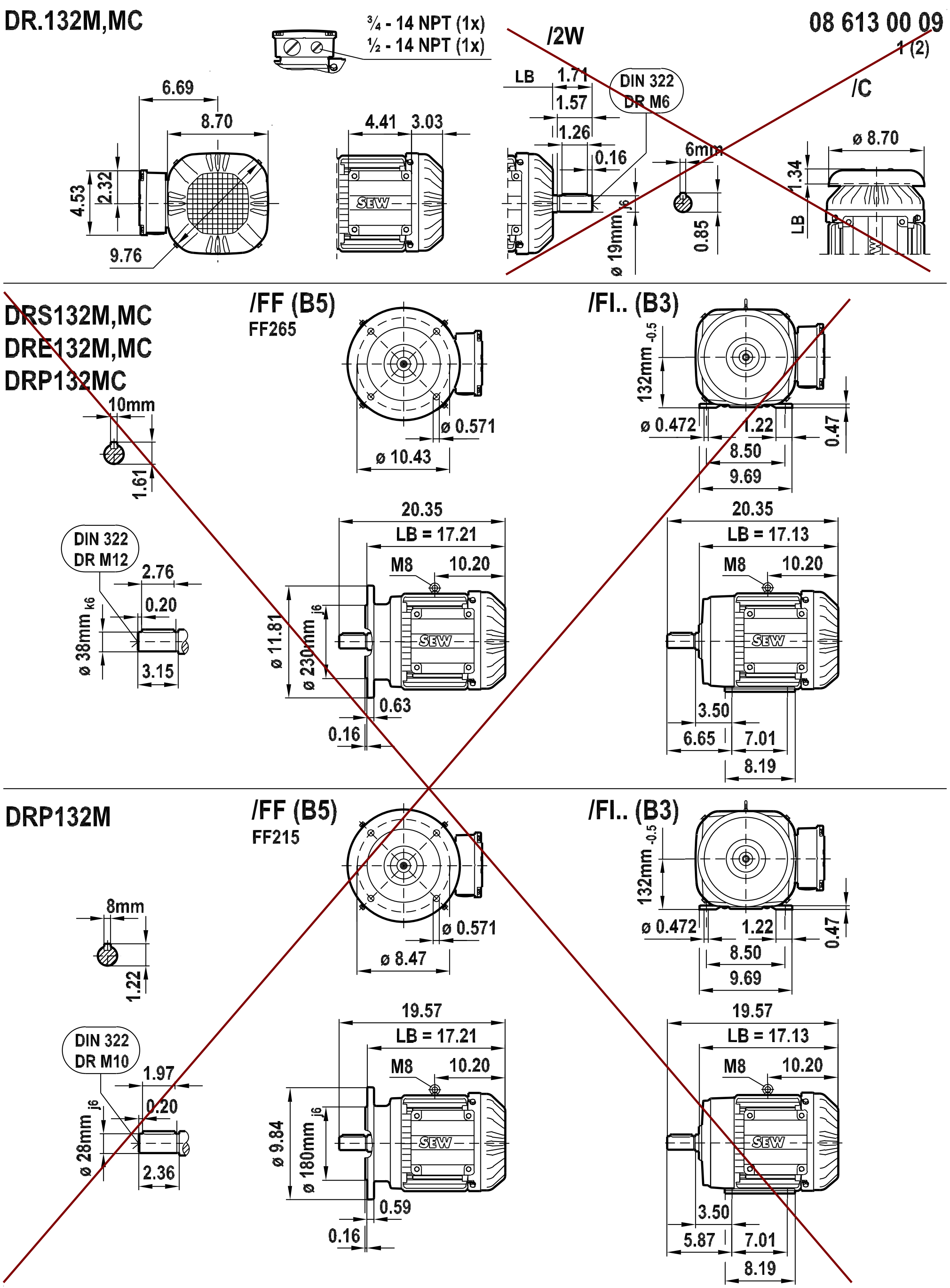
1) Efficiency levels according to IEC 60034-2-1 Ed. 1 (2007) / PLL from Residual Losses, NEMA MG1 and/or DoE

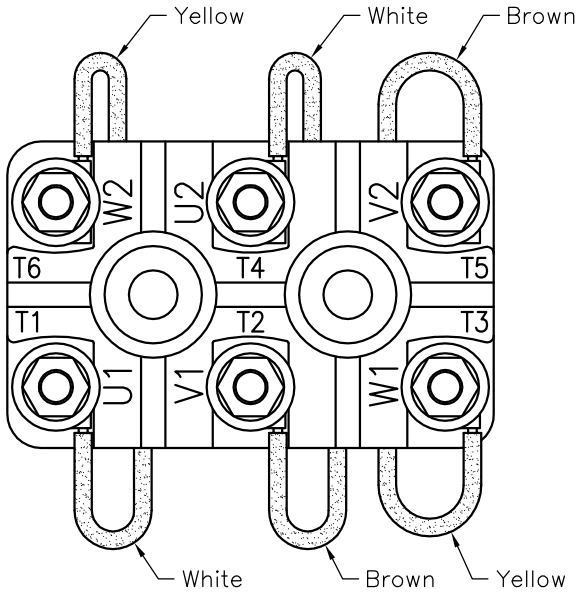
2) Applies for foot-mounted motor (DRP.../FL..)

US DoE CC056A applies to ~~DRE,~~ DRP ~~and DVE~~ motors

MOTOR DATA SHEET

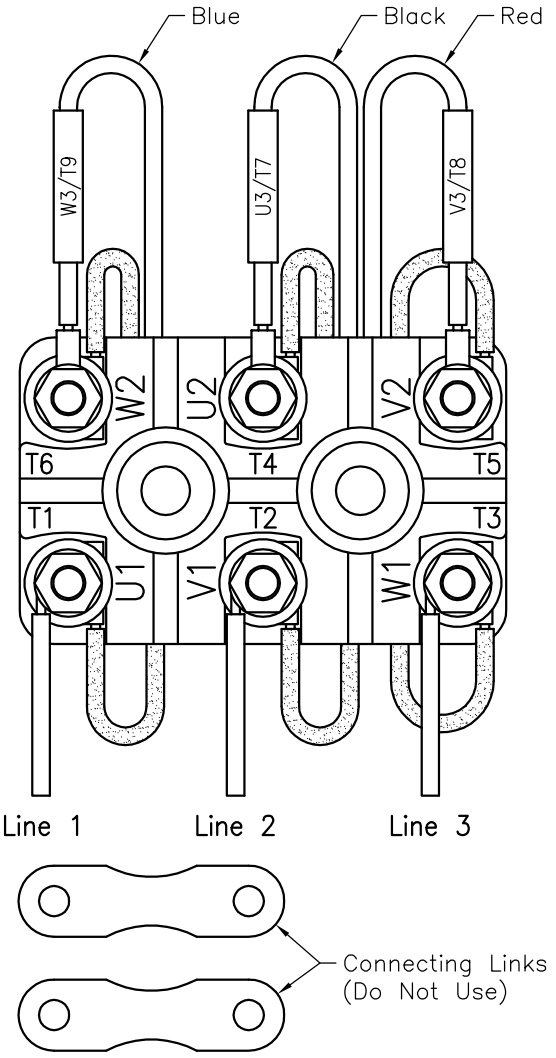
Equipment Driver		Aqua WashPress		
Motor Manufacturer		SEW Eurodrive		
Motor Type/Frame		DRP112M4/DH		
Shop Painting (low sheen metallic gray)		Emulsion pigmented w/ alloy 316 SS flake		
Horsepower		3.0 Horsepower		
Full Load Speed		1765 RPM		
Enclosure		TEFC		
Volts/Phase/Hertz		230/460/3/60		
Service Factor		1.15		
NEMA Design Code		A		
Insulation Class		F		
Ambient Temperature °C		40 °C		
Temperature Rise		Class B		
Efficiency Type		NEMA Premium (IE3)		
Efficiency %		89.5%		
Power Factor		0.82		
Features		Severe Duty Protection (IP66), Inverter Rated		
Full Load Amps		7.5/3.75		
Full Load Torque		105.0 LB-IN		
Locked Rotor Amp Ratio %		859%		
Locked Rotor Code KVA/HP		K		
Locked Rotor Torque Ratio %		250%		
Load Condition	100%	75%	50%	25%
Efficiency% @	89.6%	89.6%	88.7%	83.0%
Power Factor @	0.82	0.77	0.67	0.46


DR.132M,MC
¾ - 14 NPT (1x)
½ - 14 NPT (1x)
/2W
08 613 00 09
1 (2)
/C
6.69
8.70
4.53
2.32
9.76
4.41
3.03
LB
1.71
1.57
1.26
0.16
DIN 322
DR M6
6mm
ø 19mm j6
0.85
ø 8.70
1.34
LB
DRS132M,MC
DRE132M,MC
DRP132MC
/FF (B5)
FF265
/FI.. (B3)
10mm
1.61
ø 0.571
ø 10.43
132mm -0.5
ø 0.472
1.22
8.50
9.69
0.47
DIN 322
DR M12
2.76
0.20
ø 38mm k6
3.15
20.35
LB = 17.21
M8
10.20
ø 11.81
ø 230mm j6
0.63
0.16
20.35
LB = 17.13
M8
10.20
3.50
6.65
7.01
8.19
DRP132M
/FF (B5)
FF215
/FI.. (B3)
8mm
1.22
ø 0.571
ø 8.47
132mm -0.5
ø 0.472
1.22
8.50
9.69
0.47
DIN 322
DR M10
1.97
0.20
ø 28mm j6
2.36
19.57
LB = 17.21
M8
10.20
ø 9.84
ø 180mm j6
0.59
0.16
19.57
LB = 17.13
M8
10.20
3.50
5.87
7.01
8.19



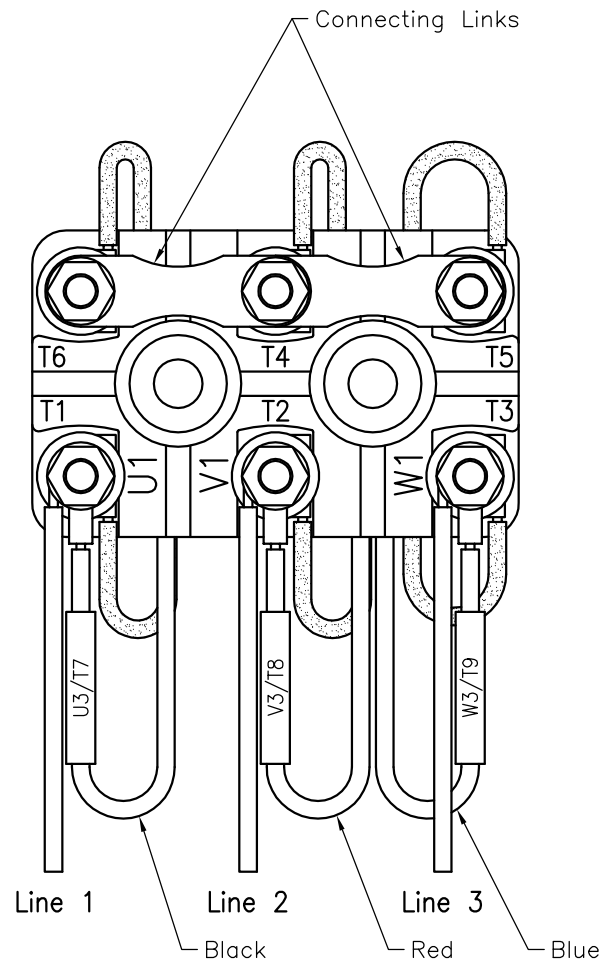
1. R76 base wiring configuration is connected to the terminal block under the lower of two (2) nuts on each terminal point stud and have a square "flag on a flagpole" terminal ring.
2. Do not move these wires when changing between 230 and 460 VAC.

R76 Base Wiring
(Do Not Change)



1. Connect black wire with ring terminal (labeled "U3/T7") to terminal point T4.
2. Connect red wire with ring terminal (labeled "V3/T8") to terminal point T5.
3. Connect blue wire with ring terminal (labeled W3/T9") to terminal point T6
4. Connect Line 1, Line 2 and Line 3 to terminal points T1, T2 and T3 respectively.

460 Volt Wiring Y



1. Connect black wire with ring terminal (labeled "U3/T7") and Line 1 to terminal point T1.
2. Connect red wire with ring terminal (labeled "V3/T8") and Line 2 to terminal point T2.
3. Connect blue wire with ring terminal (labeled W3/T9") and Line 3 to terminal point T3
4. Install connecting links between terminal points T4 and T5 and between T4 and T6.

230 Volt Wiring YY

Gearmotors and Gear Reducers

OPERATING INSTRUCTIONS

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GENERAL
These operationg instructions are intended to help you install and operate the drive. For trouble free service, proper installation and operation are essential. Additionally, these instructions contain important recommendations on maintenance.

Before shipment, every SEW-Eurodrive gear unit is tested, checked and properly packed. However, please inspect the drive immediately upon arrival for shortage or transit damage. Note the damage or shortage on the freight bill of lading and file a claim with the carrier. Also, notify SEW-Eurodrive of the shortage or damage.

LUBRICANTS
All gearmotors and gear reducers are supplied with the correct grade and quantity of lubricating oil for the specified mounting position. Exceptions include reducers shipped without input assemblies. The recommended lubricants are found on page 2.

LONG TERM STORAGE
If the drive is not installed immediately, it should be stored in a dry, protected area. If the drive is to be stored for an extended period of time and was not ordered from SEW for long term storage, contact your nearest SEW assembly plant for information on Long Term Storage or request **Document #2115**.

Drives which are used for standby service should be stored as a sealed gearcase.

INSTALLATION OF COMPONENTS ON DRIVE SHAFTS
Do not hammer on the shafts. Hammering can cause brinelling of the reducer's bearings shortening the bearing life. We recommend heating the components to approximately 175°F (when possible) and sliding them on the shaft. This will reduce possible damage to the reducer's bearings. **Document #2116**.

For both standard and metric SEW shaft tolerances, refer to the SEW Catalog or request **Document #2154.**

Shaft couplings should be properly aligned to prevent vibration, coupling wear, and premature failure of the shaft bearings.

To prevent the output shaft and bearings from being subjected to excessive loads, the maximum overhung load, as shown in SEW-Eurodrive catalogs, should not be exceeded. Please consult our engineering department if the load may exceed the recommended figure given or where there are combined radial and axial loads. In such cases, the exact operating conditions must be stated including speed, direction of rotation, position, magnitude and direction of the external radial and axial loads being applied.

SHAFT MOUNTED REDUCERS
SEW-Eurodrive supplies the recommended hollowshaft mounting paste with every hollowshaft reducer. The mounting paste is to be applied on the keyed output shaft. The mounting paste is to aid in the prevention of rusting and fretting corrosion between the reducer hollowshaft and the shaft of the driven machine. The mounting paste will aid in shaft removal when necessary.

For additional information on shaft mounted reducers, drive shaft configuration and tolerances, refer to the SEW-Eurodrive Catalog or request **Documents #2201 and #2202**.

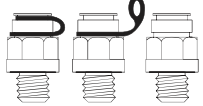
INSTALLATION AND OPERATION
The drive installation site should be selected to ensure:

- Ambient temperatures below 40°C (104°F).
- Unimpeded flow of air to the motor and variable speed units.
- Accessibility to the drain, level and breather plugs.
- Adequate space for the removal of brakemotor fanguard for brake adjustment and maintenance.

The drive unit should be mounted on a flat, vibration damping, and torsionally rigid structure. Careful alignment is critical. Mounting to an uneven surface will cause housing distortion. The flatness tolerance of the supporting surface should not exceed:

- For gear units size 80 and smaller — 0.004 inch.
- For gear units above size 80 — 0.008 inch.

Fig. 1



For transportation, the units are supplied with the breather plug already mounted. After the unit is installed, the black rubber seal located on the breather MUST BE REMOVED (Fig. 1). In addition, the oil level should be checked. Remove the plated (non-painted) oil level plug. The oil level is correct when the surface of the oil is level with the lowest point of that tapped hole, the exception is S37. Units W20 and W30 are sealed in any position.

After installation, the actual mounting position should be confirmed against the mounting postion shown on the gear reducer nameplate. Adequate lubrication is only guaranteed if the unit is mounted in the specific nameplated mounting position.

Refer to the SEW Catalog or request **Document #2111, #2112, #2113, or #2114 (R, F, K, or S, respectively)** if a specific mounting position diagram is needed.

MAINTENANCE
Warning! Always ensure equipment is secure and electrical power is off before removing or performing maintenance on the drive assembly. Oil levels and oil quality should be checked at regular intervals, determined by usage and the environment. Grease and oil should be changed per the recommendations on page 2. Check coupling alignment, chain or belt tension, and mounting bolt torque periodically. Keep the drive relatively free of dust and dirt.

For additional information, call the SEW FAXline, 1-800-601-6195, and request document ~~number~~ shown.

SEW EURODRIVE

SOUTHEAST MANUFACTURING & ASSEMBLY CENTER
1295 Old Spartanburg Hwy, Lyman, SC 29365
(864) 439-7537 Fax: (864) 439-7830

SOUTHWEST ASSEMBLY CENTER
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(937) 335-0036 Fax: (937) 222-4104

EAST COAST ASSEMBLY CENTER
200 High Hill Road, Bridgeport, NJ 08014
(856) 467-2277 Fax: (856) 330-4724

WEST COAST ASSEMBLY CENTER
30599 San Antonio Road, Hayward, CA 94544
(510) 487-3560 Fax: (510) 487-6381

ISO 9002

The approximate lubricant in US **gallons and liters** per mounting position is as follows:

Gear Unit	Mounting Position											
	M1		M2		M3		M4		M5		M6	
	Gallons	Liters	Gallons	Liters	Gallons	Liters	Gallons	Liters	Gallons	Liters	Gallons	Liters
F37	0.26	1	0.32	1.2	0.18	0.7	0.32	1.2	0.26	1	0.29	1.1
F47	0.40	1.5	0.48	1.8	0.29	1.1	0.50	1.9	0.40	1.5	0.45	1.7
F57	0.69	2.6	0.98	3.7	0.55	2.1	0.92	3.5	0.74	2.8	0.77	2.9
F67	0.71	2.7	1.00	3.8	0.50	1.9	1.00	3.8	0.77	2.9	0.85	3.2
F77	1.32	5	1.93	7.3	1.14	4.3	2.11	8	1.59	6	1.66	6.3
F87	2.64	10	3.43	13	2.03	7.7	3.65	13.8	2.85	10.8	2.91	11
F97	4.89	18.5	5.94	22.5	3.33	12.6	6.66	25.2	4.89	18.5	5.28	20
F107	6.47	24.5	8.45	32	5.15	19.5	9.91	37.5	7.13	27	7.13	27
F127	10.70	40.5	14.53	55	8.98	34	16.12	61	12.29	46.5	12.42	47
F157	18.23	69	27.48	104	16.64	63	27.74	105	22.72	86	20.61	78
FF37	0.26	1	0.32	1.2	0.18	0.7	0.34	1.3	0.26	1	0.29	1.1
FF47	0.42	1.6	0.50	1.9	0.29	1.1	0.50	1.9	0.40	1.5	0.45	1.7
FF57	0.74	2.8	1.00	3.8	0.55	2.1	0.98	3.7	0.77	2.9	0.79	3
FF67	0.71	2.7	1.00	3.8	0.50	1.9	1.00	3.8	0.77	2.9	0.85	3.2
FF77	1.35	5.1	1.93	7.3	1.14	4.3	2.14	8.1	1.59	6	1.66	6.3
FF87	2.72	10.3	3.49	13.2	2.06	7.8	3.73	14.1	2.91	11	2.96	11.2
FF97	5.02	19	5.94	22.5	3.33	12.6	6.74	25.5	4.99	18.9	5.42	20.5
FF107	6.74	25.5	8.45	32	5.15	19.5	10.17	38.5	7.27	27.5	7.40	28
FF127	10.96	41.5	14.80	56	8.98	34	16.64	63	12.29	46.5	12.95	49
FF157	19.02	72	27.74	105	16.91	64	28.01	106	22.99	87	20.87	79
FA/FH/FV37 FAF/FHF/FVF37 FAZ/FHZ/FVZ37	0.26	1	0.32	1.2	0.18	0.7	0.32	1.2	0.26	1	0.29	1.1
FA/FH/FV47 FAF/FHF/FVF47 FAZ/FHZ/FVZ47	0.40	1.5	0.48	1.8	0.29	1.1	0.50	1.9	0.40	1.5	0.45	1.7
FA/FH/FV57 FAF/FHF/FVF57 FAZ/FHZ/FVZ57	0.71	2.7	1.00	3.8	0.55	2.1	0.95	3.6	0.77	2.9	0.79	3
FA/FH/FV67 FAF/FHF/FVF67 FAZ/FHZ/FVZ67	0.71	2.7	1.00	3.8	0.50	1.9	1.00	3.8	0.77	2.9	0.85	3.2
FA/FH/FV77 FAF/FHF/FVF77 FAZ/FHZ/FVZ77	1.32	5	1.93	7.3	1.14	4.3	2.11	8	1.59	6	1.66	6.3
FA/FH/FV87 FAF/FHF/FVF87 FAZ/FHZ/FVZ87	2.64	10	3.43	13	2.03	7.7	3.65	13.8	2.85	10.8	2.91	11
FA/FH/FV97 FAF/FHF/FVF97 FAZ/FHZ/FVZ97	4.89	18.5	5.94	22.5	3.33	12.6	6.61	25	4.89	18.5	5.28	20
FA/FH/FV107 FAF/FHF/FVF107 FAZ/FHZ/FVZ107	6.47	24.5	8.45	32	5.15	19.5	9.91	37.5	7.13	27	7.13	27
FA/FH/FV127 FAF/FHF/FVF127 FAZ/FHZ/FVZ127	10.30	39	14.53	55	8.98	34	16.12	61	11.89	45	12.29	46.5
FA/FH/FV157 FAF/FHF/FVF157 FAZ/FHZ/FVZ157	17.97	68	27.21	103	16.38	62	27.48	104	22.46	85	20.34	77

For compound drives the R reducer requires its own oil filling as shown in the chart:

Gear Unit	Mounting Position					
	M1/M3/M5/M6		M2		M4	
	Gallons	Liters	Gallons	Liters	Gallons	Liters
R17	0.07	0.25	0.16	0.6	0.16	0.6
R37	0.11	0.4	0.24	0.9	0.29	1.1
R57	0.21	0.8	0.48	1.8	0.53	2
R77	0.32	1.2	1.00	3.8	1.08	4.1
R87	0.63	2.4	1.8	6.8	2.03	7.7
R97	1.35	5.1	3.14	11.9	3.70	14

9 Lubricants

General information

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position. The decisive factor is the mounting position (M1 ... M6, → Sec. "Mounting Positions and Important Order Information") specified when ordering the drive. You must adapt the lubricant fill to any subsequent changes made to the mounting position (→ Lubricant fill quantities).

9.1 Lubricant table

The lubricant table on the following page shows the permitted lubricants for SEW-EURODRIVE gear units. Please note the following key to the lubricant table.

Key to the lubricant table

Abbreviations used, meaning of shading and notes:

CLP	= Mineral oil
CLP PG	= Polyglycol (W gear units, NSF cerfitied H1)
CLP HC	= Synthetic hydrocarbons
E	= Ester oil (water hazard class 1 (German regulation))
~~HCE~~	~~= Synthetic hydrocarbons + ester oil (NSF certified H1)~~
HLP	= Hydraulic oil
	= Synthetic lubricant (= synthetic-based anti-friction bearing grease)
	= Mineral lubricant (= mineral-based anti-friction bearing grease)
~~1)~~	~~Helical-worm gear units with PG oil: Please contact SEW-Eurodrive~~
~~2)~~	~~Special lubricant for Spiroplan® gear units only~~
~~3)~~	~~SEW $f_B \geq 1.2$ required~~
4)	Pay attention to critical starting behavior at low temperatures!
5)	Ambient temperature
	~~Lubricant for the food industry (food grade oil)~~
	~~Biodegradable oil (lubricant for use in agriculture, forestry and water resources)~~

Lubricant table

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	5)	DIN (ISO)	ISO,NLGI	ExxonMobil	Shell	Klüber	ARAL	bp	Tribol	TEXACO	Optimol	FUCHS	TOTAL
R...	Standard -10 +40	CLP(CC)	VG 220	Mobilgear 600XP 220	Shell Omala 220	Klüberoil GEM 1-220 N	Aral Degol BG 220	BP Energol GR-XP 220	Tribol 1100/220	Meropa 220	Optigear BM 220	Renolin CLP 220	Carter EP 220
K...(HK...)	-25 +80	CLP PG	VG 220	Mobil Glygoyle 30	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220	Tribol 800/220	Synlube CLP 220	Optiflex A 220		Carter SY 220
	4) -40 +80	CLP HC	VG 220	Mobil SHC 630	Shell Omala HD 220	Klübersynth GEM 4-220 N	Aral Degol PAS 220		Tribol 1510/220	Pinnacle EP 220	Optigear Synthetic A 220	Renolin Unisyn CLP 220	
	4) -40 +40		VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N				Pinnacle EP 150			Carter SH 150
F...	-20 +25	CLP (CC)	VG 150 VG 100	Mobilgear 600XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-30 +10	HLP (HM)	VG 68-46 VG 32	Mobil D.T.E. 13M	Shell Tellus T 32	Klüberoil GEM 1-68 N	Aral Degol BG 46		Tribol 1100/68	Rando EP Ashless 46	Optigear 32	Renolin B 46 HVI	Equivis ZS 46
	4) -40 +10	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46			Dacnis SH 32
	4) -40 -20	HLP (HM)	VG 22 VG 15	Mobil D.T.E. 11M	Shell Tellus T 15	Isoflex MT 30 ROT		BP Energol HLP-HM 15		Rando HDZ 15			Equivis ZS 15
S...(HS...)	Standard 0 +40	CLP (CC)	VG 680	Mobilgear 600XP 680	Shell Omala 680	Klüberoil GEM 1-680 N	Aral Degol BG 680	BP Energol GR-XP 680	Tribol 1100/680	Meropa 680	Optigear BM 680	Renolin CLP 680	Carter EP 680
	-20 +60	CLP PG	VG 680 1)		Shell Tivela S 680	Klübersynth GH 6-680		BP Enersyn SG-XP 680	Tribol 800/680	Synlube CLP 680			
	4) -30 +80	CLP HC	VG 460	Mobil SHC 634	Shell Omala HD 460	Klübersynth GEM 4-460 N				Pinnacle EP 460			
	4) -40 +10		VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N				Pinnacle EP 150			Carter SH 150
	-20 +10	CLP (CC)	VG 150 VG 100	Mobilgear 600XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Tribol 1100/100	Meropa 150	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-25 +20	CLP PG	VG 220 1)	Mobil Glygoyle 30	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220	Tribol 800/220	Synlube CLP 220	Optiflex A 220		Carter SY 220
	4) -40 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32				Cetus PAO 46			Dacnis SH 32
R...,K...(HK...), F...,S...(HS...)	Standard -20 +40	CLP PG	VG 460 1)			Klübersynth UH1 6-460							
	4) -30 +40	HCE	VG 460		Shell Cassida Fluid GL 460	Klüberoil 4UH1-460 N	Aral Eural Gear 460				Optileb GT 460		
	-20 +40	E	VG 460			Klüberbio CA2-460	Aral Degol BAB 460				Optisynt BS 460		
W...(HW...)	Standard -20 +40	SEW PG	VG 460 2)			Klüber SEW HT-460-5							
	4) -40 +10	API GL5	SAE 75W90 (~VG 100)	Mobilube SHC 75 W90-LS									
	-20 +40	CLP PG	VG 460 3)			Klübersynth UH1 6-460							

3.2 Basicstructure of parallel shaft helical gear units

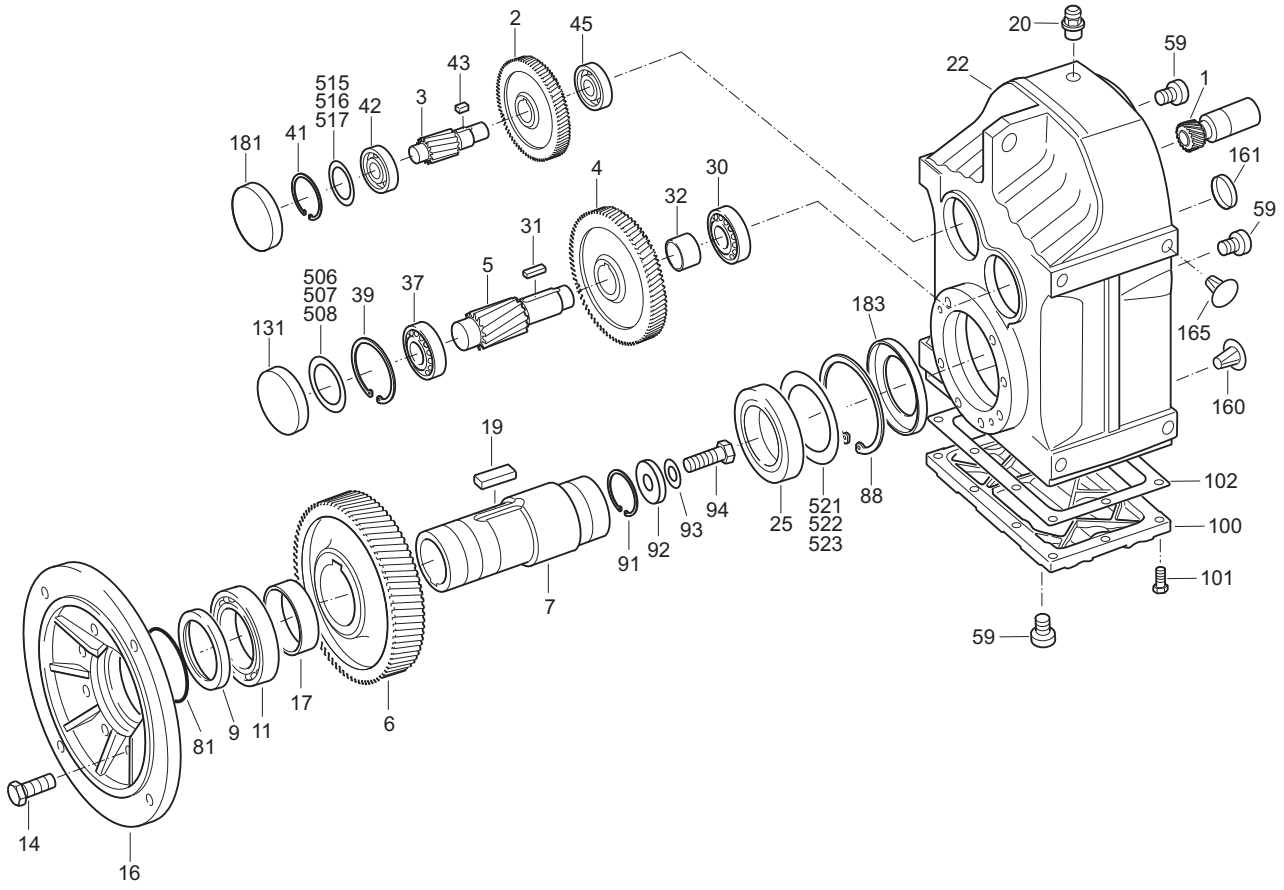

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Figure 2: Basic structure of parallel shaft helical gear units

Key

1	Pinion	22	Gearcase	91	Circlip	506	Shim ring
2	Gear	25	Anti-friction bearing	92	Washer	507	Shim ring
3	Pinion shaft	30	Anti-friction bearing	93	Lock washer	508	Shim ring
4	Gear	31	Key	94	Hex head bolt	515	Shim ring
5	Pinion shaft	32	Spacer	100	Gearcase cover	516	Shim ring
6	Gear	37	Anti-friction bearing	101	Hex head bolt	517	Shim ring
7	Hollow shaft	39	Circlip	102	Gasket	521	Shim ring
9	Oil seal	41	Circlip	131	Closing cap	522	Shim ring
11	Anti-friction bearing	42	Anti-friction bearing	160	Closing plug	523	Shim ring
14	Hex head bolt	43	Key	161	Closing cap		
16	Output flange	45	Anti-friction bearing	165	Closing plug		
17	Spacer	59	Screw plug	181	Closing cap		
19	Key	81	O-ring	183	Oil seal		
20	Breather valve	88	Circlip				

Parts List

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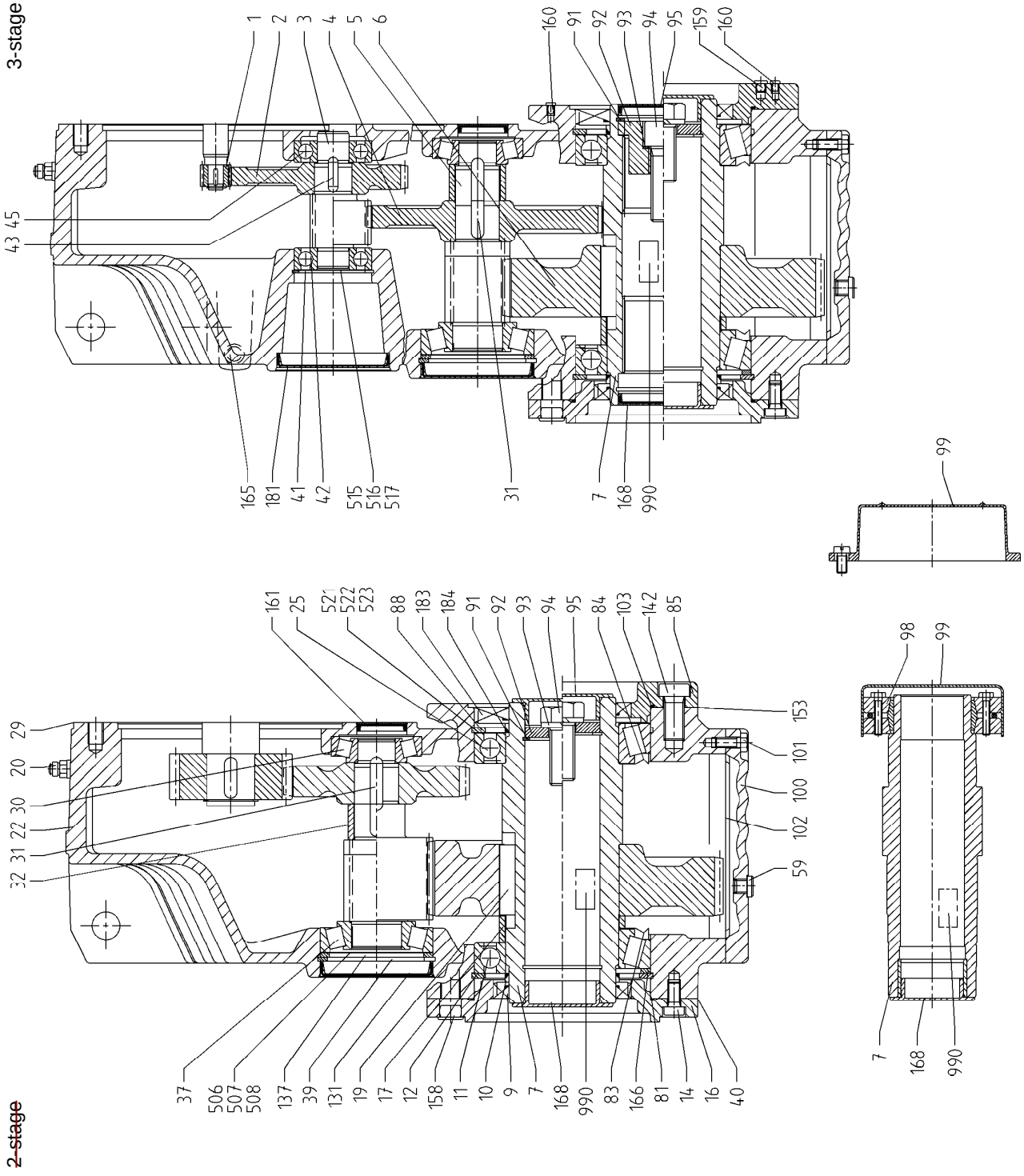
Parallel shaft helical gear unit

FAZ87, ~~FHZ87, FVZ87~~



When ordering spare parts always quote nameplate data with serial number and designation with part number!
Mount-on gear units have motors, variable speed gear units or special input shaft assemblies mounted on the drive end. For parts see appropriate parts list.

No.	Description	Additional specifications	SEW standard label	Part No.	Qty.
1	Pinion			*	1
2	Gear			*	1
3	Pinion shaft			*	1
4	Gear			*	1
5	Pinion shaft			*	1
6	Gear			*	1
7	Hollow Shaft	FAZ87	Ø 60 mm	06432611	1
~~7~~	~~Hollow Shaft~~	~~FAZ87; stainless; ASEPTICplus~~	~~Ø 60 mm~~	~~00453196~~	~~1~~
~~7~~	~~Hollow Shaft~~	~~FAZ87; Reinforced bearings~~	~~Ø 60 mm~~	~~00462659~~	~~1~~
~~7~~	~~Hollow Shaft (inch)~~	~~FAZ87~~	~~Ø 2,375 in.~~	~~06432824~~	~~1~~
~~7~~	~~Hollow shaft complete~~	~~FHZ87~~	~~Ø 65 mm~~	~~06431771~~	~~1~~
~~7~~	~~Hollow shaft complete~~	~~FHZ87; Reinforced bearings; reduced backlash version~~	~~Ø 65 mm~~	~~00453897~~	~~1~~
~~7~~	~~Hollow shaft complete~~	~~FHZ87~~	~~Ø 65/66 mm~~	~~00424528~~	~~1~~
~~7~~	~~Splined hollow shaft~~	~~FVZ87~~	~~65x2x30x31~~	~~06434002~~	~~1~~
9	Oil seal		W BASF85x110x12/10-NBR	00177709	1
~~9~~	~~Oil seal~~	~~optional oil seal in Vitonoptional oil seal in FKM (Viton); ATEX model according to category II2G, II2D, II3G, II3D; ASEPTICplus~~	~~W BASF85x110x12/10-FKM~~	~~00178101~~	~~1~~
~~10~~	~~Oil seal~~	~~Double sealing as an option; ATEX model according to category II2G, II2D, II3G, II3D; ASEPTICplus~~	~~W4562 B1 SF85x104x10/16,5 FKM~~	~~00173703~~	~~1~~
~~11~~	~~Deep groove ball bearing~~		~~DIN625 6018-Z~~	~~00117307~~	~~1~~
11	Tapered roller bearing	Reinforced bearings; FHZ87 in reduced backlash design	DIN720 32018X	00139300	1
12	Circlip		DIN472 140x4	00103314	1
14	Machine screw		DIN6912 M10x20-8.8	00110469	2
16	Centering Flange			0643035X	1
~~17~~	~~Spacer tube~~		~~Ø91xØ100x22 mm~~	~~06430120~~	~~1~~
17	Spacer tube	Reinforced bearings; FHZ87 in reduced backlash design	Ø91xØ100x10 mm	00428086	1
19	Key		DIN6885 B20x12x56-55HRC	00134929	1
20	Breather valve		W4087 M12x1,5-CuZn	00130311	1
~~20~~	~~Breather valve~~	~~stainless; ASEPTICplus~~	~~W4087 M12x1,5-NIRO~~	~~00136247~~	~~1~~
~~22~~	~~Gear Housing~~			~~06420168~~	~~1~~
22	Gear Housing	Reinforced bearings; FHZ87 in reduced backlash design		00428051	1
~~25~~	~~Deep groove ball bearing~~		~~DIN625 6018-Z~~	~~00117307~~	~~1~~
25	Tapered roller bearing	Reinforced bearings; FHZ87 in reduced backlash design	DIN720 32018X	00139300	1
29	Sealing compound			09102558	X)
30	Tapered roller bearing		DIN720 303 06	0012477X	1
~~31~~	~~Key~~	~~2-stage~~	~~DIN6885 B10x8x32-55HRC~~	~~00100579~~	~~1~~
31	Key	3-stage	DIN6885 AB10x8x30-55HRC	00135453	1
32	Spacer tube	For i 9,58 - 270,68	Ø36xØ45x29 mm	06420648	1
37	Tapered roller bearing		DIN720 303 08	00106046	1
39	Circlip		DIN472 90x3	00103268	1
40	Sealing compound			09102558	X)
41	Circlip		DIN472 62x2	00103217	1
42	Deep groove ball bearing		DIN625 6305	00105090	1
43	Key		DIN6885 B8x7x20-55HRC	00115991	1
45	Deep groove ball bearing		DIN625 6305	00105090	1
59	Screw plug		W4085 M12x1,5-ST-A2L	00114308	5

* Gearing parts have embossed part numbers. These must always be quoted!
X) if required
When ordering spare parts always quote nameplate data with serial number and designation with part number!
Mount-on gear units have motors, variable speed gear units or special input shaft assemblies mounted on the drive end. For parts see appropriate parts list.

No.	Description	Additional specifications	SEW standard label	Part No.	Qty.
81	O-ring		W4283 135x3-NBR	00176613	1
83	Nilos ring	Reinforced bearings; FHZ87 in reduced backlash design	W4587 32018X-AV	00136840	1
84	Nilos ring	Reinforced bearings; FHZ87 in reduced backlash design	W4587 32018X-AV	00136840	1
85	Oil Seal Flange	Reinforced bearings; FHZ87 in reduced backlash design		0042806X	1
88	Circlip		DIN472 140x4	00103314	1
91	Circlip	FAZ87	DIN472 60x2	00103365	1
~~91~~	~~Circlip~~	~~FAZ87; stainless; ASEPTICplus~~	~~DIN472 60x2 Niro~~	~~13228013~~	~~1~~
~~91~~	~~Circlip~~	~~FVZ87~~	~~DIN472 72x2,5~~	~~00103225~~	~~1~~
92	Disc	FAZ87	W4132 22x59,5x8	01033913	1
~~92~~	~~Disc~~	~~FAZ87; stainless; ASEPTICplus~~	~~W4132 22x59,5x8 Niro~~	~~13228102~~	~~1~~
~~92~~	~~Disc~~	~~FVZ87~~		~~01174061~~	~~1~~
93	Lock washer	FAZ87	DIN128 A20-FST-PHR	00109967	1
~~93~~	~~Lock washer~~	~~FAZ87; stainless; ASEPTICplus~~	~~DIN128 A20-NIRO~~	~~00159980~~	~~1~~
93	Supporting disc	FVZ87	DIN988 S22x32x2-FST	00103446	1
94	Hex head screw	FAZ87	ISO4017 M20x50-8.8	00101281	1
~~94~~	~~Hex head screw~~	~~FAZ87; stainless; ASEPTICplus~~	~~ISO4017 M20x50xA2-70~~	~~00159972~~	~~1~~
94	Hex head screw	FAZ87	ISO4017 3/4-10x2 IN.	08069581	1
~~94~~	~~Machine screw~~	~~FVZ87~~	~~ISO4762 M20x60-8.8~~	~~00123315~~	~~1~~
95	Closing plug	FAZ87	W4299 60,8	01140973	1
~~95~~	~~Closing cap~~	~~FVZ87~~	~~W4300 72x9~~	~~00106925~~	~~1~~
98	Shrink Disc	FHZ87	W4941 85x155	01226339	1
~~99~~	~~Hood Cover~~	~~FHZ87~~		~~01140981~~	~~1~~
~~99~~	~~Hood cover complete~~	~~FHZ87~~		~~06435173~~	~~1~~
~~99~~	~~Hood cover complete~~	~~FHZ87; ATEX model according to category II2G, II2D, II3G, II3D; ASEPTICplus~~		~~06435882~~	~~1~~
100	Gearcase cover			06420052	1
101	Hex head screw		ISO4017 M8x20-8.8	00110256	10
102	Sealing compound			09102558	X)
103	O-ring	Reinforced bearings; FHZ87 in reduced backlash design	W4283 135x3-NBR	00176613	1
131	Closing cap		W4300 90x12	00111627	1
137	Supporting disc		DIN988 S75x90x3,5-FST	00120340	1
142	Machine screw	Reinforced bearings; FHZ87 in reduced backlash design	DIN6912 M16x35-8.8-A2F	00101672	4
158	Closing plug		W4299 17,8	00113832	6
159	Closing plug		W4299 7,1	00136042	2
160	Closing plug		W4299 5,4	00113824	2
161	Closing cap		W4300 40x7	00111651	1
165	Closing plug		W4299 14,5	00113743	8
166	Supporting disc	Reinforced bearings; FHZ87 in reduced backlash design	W4140 S125x140x3,5-FSt	00179191	1
168	Closing plug	FAZ87	W4299 60,8	01140973	1
~~168~~	~~Closing plug~~	~~FHZ87~~	~~W4299 65,5~~	~~00126683~~	~~1~~
~~168~~	~~Closing cap~~	~~FVZ87~~	~~W4300 72x9~~	~~00106925~~	~~1~~
181	Closing cap		W4300 90x12	00111627	1
~~183~~	~~Oil seal~~		~~W4560 BA-SF85x140x12/10 NBR~~	~~00177695~~	~~1~~
~~183~~	~~Oil seal~~	~~optional oil seal in Vitonoptional oil seal in FKM (Viton); ATEX model according to category II2G, II2D, II3G, II3D; ASEPTICplus~~	~~W4561 BA-SF85x140x12/10 FKM~~	~~00178098~~	~~1~~
183	Oil seal	Reinforced bearings; FHZ87 in reduced backlash design	W BASF85x110x12/10-NBR	00177709	1

X) if required
When ordering spare parts always quote nameplate data with serial number and designation with part number!
Mount-on gear units have motors, variable speed gear units or special input shaft assemblies mounted on the drive end. For parts see appropriate parts list.

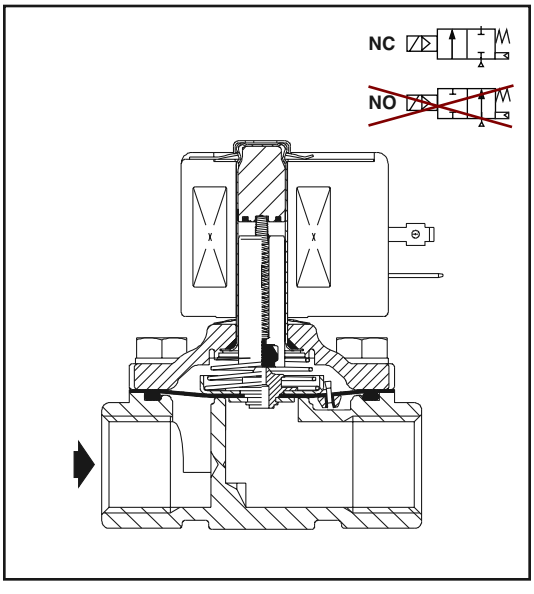
~~No.~~	~~Description~~	~~Additional specifications~~	~~SEW standard label~~	~~Part No.~~	~~Qty.~~
~~183~~	~~Oil seal~~	~~optional oil seal in Vitonoptional oil seal in FKM (Viton); Reinforced bearings or FHZ87 in reduced backlash design in conjunction with ATEX model according to category II2G, II2D, II3G, II3D or ASEPTICplus~~	~~W BASF85x110x12/10-FKM~~	~~00178101~~	~~1~~
184	Oil seal	Double sealing; ATEX model according to category II2G, II2D, II3G, II3D; ASEPTICplus	W4562 B1-SF85x134x10/16,5-FKM	0017369X	1
506	Shim		DIN988 75x90x0,1-ST	00120545	X)
507	Shim		DIN988 75x90x0,3-ST	00120553	X)
508	Shim		DIN988 75x90x0,5-ST	00120561	X)
515	Shim		DIN988 50x62x0,1-ST	00103764	X)
516	Shim		DIN988 50x62x0,3-ST	00104000	X)
517	Shim		DIN988 50x62x0,5-ST	00104183	X)
~~521~~	~~Shim~~		~~DIN988 110x140x0,1-ST~~	~~00113263~~	~~X)~~
521	Shim	Reinforced bearings; FHZ87 in reduced backlash design	W4140 125x140x0,1-St	00179132	X)
~~522~~	~~Shim~~		~~DIN988 110x140x0,3-ST~~	~~00113409~~	~~X)~~
522	Shim	Reinforced bearings; FHZ87 in reduced backlash design	W4140 125x140x0,3-St	00179140	X)
~~523~~	~~Shim~~		~~DIN988 110x140x0,5-ST~~	~~00113514~~	~~X)~~
523	Shim	Reinforced bearings; FHZ87 in reduced backlash design	W4140 125x140x0,5-St	00179159	X)
990	Contact corrosion inhibitor			09107819	1

X) if required
When ordering spare parts always quote nameplate data with serial number and designation with part number!
Mount-on gear units have motors, variable speed gear units or special input shaft assemblies mounted on the drive end. For parts see appropriate parts list.

Solenoid Valve Data

Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage
- High Flow Valves for liquid, corrosive, and air/inert gas service
- Industrial applications include:
  - Car wash
  - Laundry equipment
  - Air compressors
  - Industrial water control
  - Pumps



Construction

Valve Parts in Contact with Fluids		
Body	Brass	~~304 Stainless Steel~~
Seals and Discs	NBR ~~or PTFE~~	
Disc-Holder	PA	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	~~Silver~~

Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
		AC			General Purpose		Explosionproof	
	DC Watts	Watts	VA Holding	VA Inrush	AC	DC	AC	DC
~~F~~		~~6.1~~	~~16~~	~~40~~	~~238210~~		~~238214~~	
F	~~11.6~~	10.1	25	70	238610	~~238710~~	~~238614~~	~~238714~~
~~F~~	~~16.8~~	~~16.1~~	~~35~~	~~180~~	~~272610~~	~~97617~~	~~272614~~	~~97617~~
F	-	17.1	40	93	238610	-	238614	-
F	-	20	43	240	99257	-	99257	-
F	-	20.1	48	240	272610	-	272614	-
H	30.6	-	-	-	-	74073	-	74073
H	40.6	-	-	-	-	238910	-	238914

Standard Voltages: ~~24,~~ 120, ~~240, 480~~ volts AC, ~~60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC.~~ Must be specified when ordering.
Other voltages available when required.

Solenoid Enclosures

Standard: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

~~**Optional:** RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.~~

~~(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)~~

See Optional Features Section for other available options.

Nominal Ambient Temp. Ranges

RedHat II/
RedHat AC: 32˚F to 125˚F (0˚C to 52˚C)

~~RedHat II DC: 32˚F to 104˚F (0˚C to 40˚C)~~
~~RedHat DC: 32˚F to 77˚F (0˚C to 25˚C)~~
~~(104˚F/40˚C occasionally)~~

Refer to Engineering Section for details.

Approvals

CSA certified. RedHat II meets applicable CE directives.
Refer to Engineering Section for details.

2/2 SERIES 8210

ASCO®

Specifications (English units)

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Operating Pressure Differential (psi)							Max. Fluid Temp. °F		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ⑦	
				Max. AC			Max. DC												
			Min.	Air-Inert Gas	Water	Light Oil @ 300 SSU	Air-Inert Gas	Water	Light Oil @ 300 SSU	AC	DC	Catalog Number	Const. Ref. ④	UL ⑤ Listing	Catalog Number	Const. Ref. ④	UL ⑤ Listing	AC	DC
NORMALLY CLOSED (Closed when de-energized), NBR or PTFE ② Seating																			
3/8	3/8	1.5	①	150	125	-	40	40	-	180	150	8210G073 ③	1P	●	8210G036 ③	1P	●	6.1/F	11.6/F
3/8	5/8	3	0	150	150	-	40	40	-	180	150	8210G093	5D	❍	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	200	150	135	125	100	100	180	150	8210G001	6D	❍	-	-	-	6.1/F	11.6/F
3/8	5/8	3	5	300	300	300	-	-	-	175	-	8210G006	5D	❍	-	-	-	17.1/F	-
1/2	7/16	2.2	①	150	125	-	40	40	-	180	150	8210G015 ③	2P	●	8210G037 ③	2P	●	6.1/F	11.6/F
1/2	5/8	4	0	150	150	-	40	40	-	180	150	8210G094	5D	❍	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	40	40	-	175	150	-	-	-	8210G087	7D	●	17.1/F	11.6/F
1/2	5/8	4	5	200	150	135	125	100	100	180	150	8210G002	6D	❍	-	-	-	6.1/F	11.6/F
1/2	5/8	4	5	300	300	300	-	-	-	175	-	8210G007	5D	❍	-	-	-	17.1/F	-
1/2	3/4	4	5	-	300	-	-	300	-	180	125	8210G227	5D	❍	-	-	-	17.1/F	40.6/H
3/4	5/8	4.5	0	150	150	125	40	40	-	175	150	-	-	-	8210G088	7D	●	17.1/F	11.6/F
3/4	3/4	5	5	125	125	125	100	90	75	180	150	8210G009	9D	❍	-	-	-	6.1/F	11.6/F
3/4	3/4	5	0	150	150	-	40	40	-	180	150	8210G095	8D	❍	-	-	-	10.1/F	11.6/F
3/4	3/4	6.5	5	250	150	100	125	125	125	180	150	8210G003	11D	❍	-		-	6.1/F	11.6/F
3/4	3/4	6	0	-	-	-	200	180	180	-	77	8210B026 ② ‡	10P	-	-	-	-	-	30.6/H
3/4	3/4	6	0	350	300	200	-	-	-	200	-	8210G026 ② ‡	40P	●	-	-	-	16.1F	-
1	1	13	0	-	-	-	100	100	80	-	77	8210B054 ‡	31D	-	8210D089	15D	-	-	30.6/H
1	1	13	0	150	125	125	-	-	-	180	-	8210G054	41D	●	8210G089	45D	●	16.1/F	-
1	1	13	5	150	150	100	125	125	125	180	150	8210G004	12D	❍	-	-	-	6.1/F	11.6/F
1	1	13.5	0	300	225	115	-	-	-	200	-	8210G027 ‡	42P	●	-	-	-	20.1/F	-
1	1	13.5	10	300	300	300	-	-	-	175	-	8210G078 ②	13P	-	-	-	-	17.1/F	-
1 1/4	1 1/8	15	0	-	-	-	100	100	80	-	77	8210B055 ‡	32D	-	-	-	-	-	30.6/H
1 1/4	1 1/8	15	0	150	125	125	-	-	-	180	-	8210G055	43D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	5	150	150	100	125	125	125	180	150	8210G008	16D	❍	-	-	-	6.1/F	11.6/F
1 1/2	1 1/4	22.5	0	-	-	-	100	100	80	-	77	8210B056 ‡	33D	-	-	-	-	-	30.6/H
1 1/2	1 1/4	22.5	0	150	125	125	-	-	-	180	-	8210G056	44D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	5	150	150	100	125	125	125	180	150	8210G022	18D	●	-	-	-	6.1/F	11.6/F
2	1 3/4	43	5	150	125	90	50	50	50	180	150	8210G100	20P	●	-	-	-	6.1/F	11.6/F
2 1/2	1 3/4	45	5	150	125	90	50	50	50	180	150	8210G101	21P	●	-	-	-	6.1/F	11.6/F
NORMALLY OPEN (Open when de-energized), NBR Seating (PA Disc-Holder, except as noted)																			
3/8	5/8	3	0	150	150	125	125	125	80	180	150	8210G033	23D	●	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	250	200	200	250	200	200	180	180	8210G011 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	125	125	80	180	150	8210G034	23D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G030	37D	●	10.1/F	11.6/F
1/2	5/8	4	5	250	200	200	250	200	200	180	180	8210G012 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
3/4	3/4	5.5	0	150	150	125	125	125	80	180	150	8210G035	25D	●	-	-	-	10.1/F	11.6/F
3/4	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G038	38D	●	10.1/F	11.6/F
3/4	3/4	6.5	5	-	-	-	250	200	200	-	180	8210C013	24D	●	-	-	-	-	16.8/F
3/4	3/4	6.5	5	250	200	200	-	-	-	180	-	8210G013	46D	●	-	-	-	16.1/F	-
1	1	13	0	125	125	125	-	-	-	180	-	8210B057 ⑥ ⑩	34D	●	-	-	-	20/F	-
1	1	13	5	-	-	-	125	125	125	-	180	8210D014	26D	●	-	-	-	-	16.8/F
1	1	13	5	150	150	125	-	-	-	180	-	8210G014	47D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	0	125	125	125	-	-	-	180	-	8210B058 ⑥ ⑩	35D	●	-	-	-	20/F	-
1 1/4	1 1/8	15	5	-	-	-	125	125	125	-	180	8210D018	28D	●	-	-	-	-	16.8/F
1 1/4	1 1/8	15	5	150	150	125	-	-	-	180	-	8210G018	48D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	0	125	125	125	-	-	-	180	-	8210B059 ⑥ ⑩	36D	●	-	-	-	20/F	-
1 1/2	1 1/4	22.5	5	-	-	-	125	125	125	-	180	8210D032	29D	●	-	-	-	-	16.8/F
1 1/2	1 1/4	22.5	5	150	150	125	-	-	-	180	-	8210G032	49D	●	-	-	-	16.1/F	-
2	1 3/4	43	5	-	-	-	125	125	125	-	150	8210 103	30P	●	-	-	-	-	16.8/F
2	1 3/4	43	5	125	125	125	-	-	-	180	-	8210G103	50P	●	-	-	-	16.1/F	-
2 1/2	1 3/4	45	5	-	-	-	125	125	125	-	150	8210 104	27P	●	-	-	-	-	16.8/F
2 1/2	1 3/4	45	5	125	125	125	-	-	-	180	-	8210G104	51P	●	-			16.1/F	-

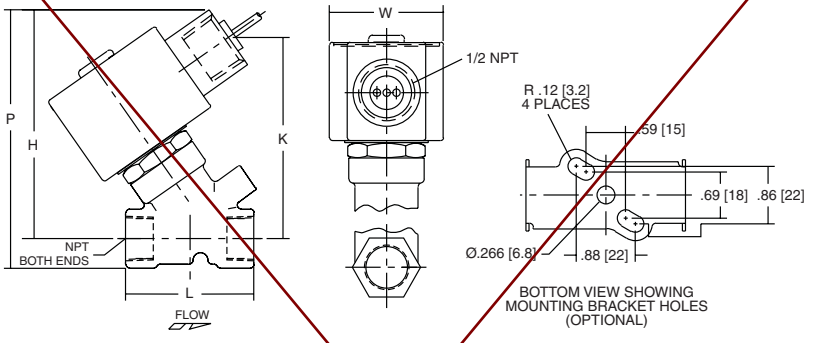
① 5 psi on Air; 1 psi on Water.
② Valve provided with PTFE main disc.
③ Valve includes Ultem (G.E. trademark) piston.
④ Letter "D" denotes diaphragm construction; "P" denotes piston construction.
⑤ ❍ Safety Shutoff Valve; ● General Purpose Valve.
Refer to Engineering Section (Approvals) for details.
⑥ Valves not available with Explosionproof enclosures.
⑦ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts.
⑧ AC construction also has PA seating.
⑨ No disc-holder.
⑩ Stainless steel disc-holder.
‡ Must have solenoid mounted vertical and upright.

Dimensions: inches (mm)

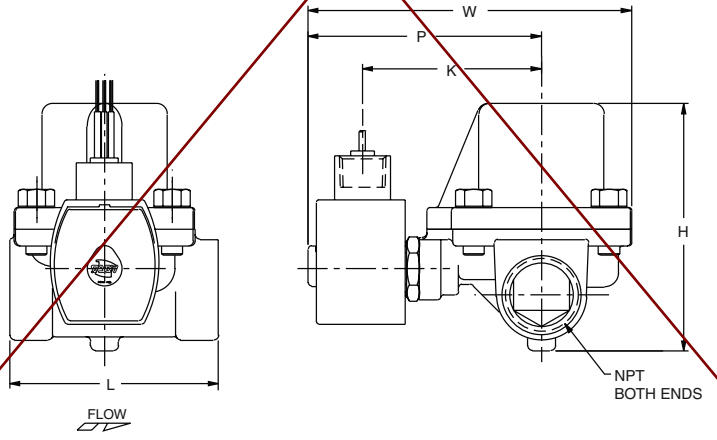
Const. Ref.		H	K	L	P	W
1*	ins.	3.85	3.00	1.91	3.41	1.69
	mm	98	76	49	87	43
2*	ins.	4.17	3.25	2.28	3.63	1.69
	mm	106	83	58	92	43
5	ins.	3.84	2.31	2.75	3.28	2.28
	mm	98	59	70	83	58
6*	ins.	3.38	1.94	2.75	2.80	2.28
	mm	86	49	70	71	58
7	ins.	4.19	2.50	2.81	3.47	2.39
	mm	106	64	71	88	61
8	ins.	4.13	2.47	2.81	3.44	2.29
	mm	105	63	71	87	58
9*	ins.	3.66	2.10	2.81	2.96	2.28
	mm	93	53	71	75	58
10*	ins.	5.25	X	2.81	4.59	2.31
	mm	133	X	71	117	59
11*	ins.	4.16	2.66	3.84	3.52	2.75
	mm	106	68	98	89	70
12	ins.	5.64	3.15	3.75	4.01	3.36
	mm	143	80	95	102	85
13	ins.	4.44	3.22	3.75	4.19	5.81
	mm	113	82	95	106	147
15*	ins.	5.34	X	3.75	4.47	3.84
	mm	136	X	95	114	98
16	ins.	5.64	3.15	3.66	4.01	3.56
	mm	143	80	93	102	90
18	ins.	6.11	3.30	4.38	4.16	3.92
	mm	155	84	111	106	100
20*	ins.	7.33	3.71	5.06	4.57	4.87
	mm	186	94	129	116	124
21*	ins.	7.33	3.71	5.50	4.57	4.87
	mm	186	94	140	116	124
23	ins.	4.35	2.65	2.75	3.79	2.28
	mm	110	67	70	96	58
24	ins.	5.06	X	3.78	4.44	2.75
	mm	129	X	96	113	70
25	ins.	4.64	2.81	2.81	3.94	2.28
	mm	118	71	71	100	58
26	ins.	6.53	X	3.75	4.91	3.19
	mm	166	X	95	125	81
27	ins.	8.22	X	5.50	5.47	4.87
	mm	209	X	140	139	124
28	ins.	6.53	X	3.66	4.91	3.19
	mm	166	X	93	125	81
29	ins.	7.03	X	4.38	5.06	4.40
	mm	179	X	111	129	112

* DC dimensions slightly larger.
IMPORTANT: Valves may be mounted in any position, except as noted in specifications table.

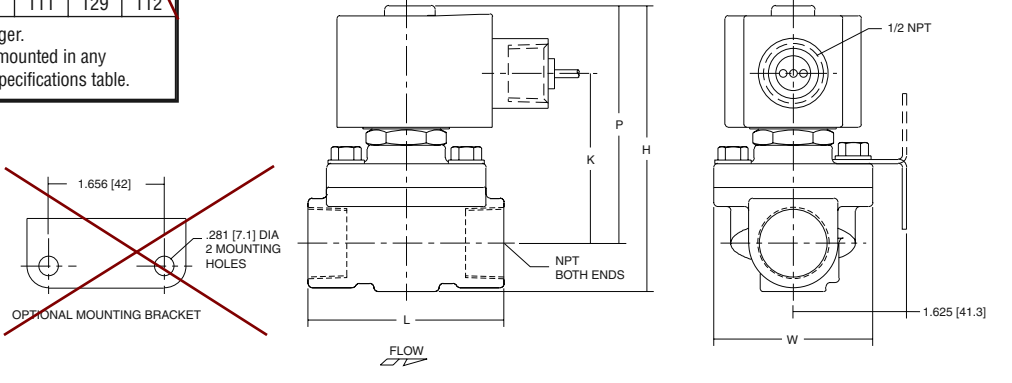
Const. Ref. 1, 2



Const. Ref. 13



Const. Ref. 5-9, ~~11, 20, 21, 23 , 25, 37,38~~



Installation & Maintenance Instructions

2–WAY INTERNAL PILOTED–OPERATED SOLENOID VALVES
NORMALLY CLOSED OPERATION — GENERAL SERVICE
3/8″, 1/2″ OR 3/4″ NPT

SERIES
8210
8211

Form No.V5848R2

NOTICE: See separate solenoid installation and maintenance instructions for information on: Wiring, Solenoid Temperature, Cause of Improper Operation, Coil or Solenoid Replacement.

DESCRIPTION

Series 8210 valves are 2–way normally closed internal pilot–operated solenoid valves designed for general service. Valves are made of rugged forged brass. Series 8210 valves are provided with a general purpose solenoid enclosure.

Series EF8210 and 8211 are the same as Series 8210 except they are provided with an explosionproof or explosionproof/watertight solenoid enclosure.

OPERATION

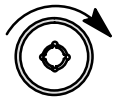
Normally Closed: Valve is closed when solenoid is de–energized; open when energized.

IMPORTANT: Minimum operating pressure differential required is 5 psi.

Manual Operator (optional feature)

Manual operator allows manual operation when desired or during an electrical power outage. To engage manual operator (open the valve), push in knurled cap and rotate stem clockwise 180°. Valve will now be in the same position as when the solenoid is energized. To disengage manual operator (close the valve), turn stem counterclockwise 180°.

Push in and rotate 180° clockwise to operate



⚠ CAUTION: For valve to operate electrically, manual operator stem must be fully rotated counterclockwise.

Relocation of Manual Operator

Manual operator may be relocated at 90° increments by rotating the valve bonnet as follows:

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before relocating manual operator.

1. See separate solenoid installation and maintenance instruction's and follow instructions to loosen solenoid to allow rotation of enclosure.
2. Be sure manual operator stem is fully rotated counterclockwise.
3. Remove bonnet screws from valve body.
4. Lift valve bonnet slightly and rotate to desired position. Do not rotate the diaphragm assembly with the valve bonnet.
5. Replace bonnet screws and torque in a crisscross manner to 95 ± 10 in–lbs [10,7 ± 1,1 Nm].
6. Position and tighten solenoid in place, see separate instructions.

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service.

7. Test operate valve electrically and manually. Be sure valve can be test operated without effecting other equipment.
8. Restore line pressure and electrical power supply to valve.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid after disassembly and reassembly.

Temperature Limitations

For maximum valve ambient and fluid temperatures, refer to chart below. Check catalog number and watt rating on nameplate.

Watt Rating AC or DC	Catalog Number Prefix	Solenoid Class	Max. Amb. Temp. °F	Max. Fluid Temp. °F
6 / AC	None or DF	F	122	180
	HT	H	140	180
6.1 / AC	None, KF, SF, or SC	F	125	180
	HT, KH, ST or SU	H	140	180
11.2 / DC	None or HT	F or H	77	150
11.6 / DC	None, HT, KF, KH, SC, SF or ST	F or H	104	150

Positioning

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub–assembly area.

Mounting

For mounting bracket (optional feature) dimensions, refer to Figure 1.

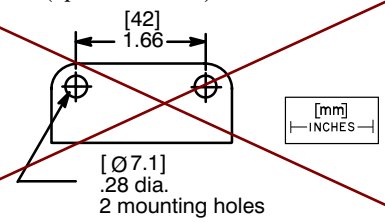


Figure 1. Mounting bracket dimensions

Piping

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

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⚠ CAUTION: To protect the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Clean periodically depending on service conditions. See ASCO Series 8600, 8601 and 8602 for strainers.

MAINTENANCE

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before servicing the valve.

NOTE: It is not necessary to remove the valve from the pipeline for repairs.

Cleaning

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to open or close. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- While in service, the valve should be operated at least once a month to insure proper opening and closing.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve and clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Valve Disassembly

1. Disassemble valve in an orderly fashion using exploded views for identification and placement of parts. Refer to Figure 2 for AC construction; Figure 3 for DC construction.
2. Remove solenoid enclosure. See separate instructions.

- ***For AC construction (standard or with manual operator), proceed as follows:***

3. For standard construction, remove bonnet screws, solenoid base sub−assembly, core spring, core assembly, diaphragm spring, diaphragm assembly and body gasket from valve body.
4. For manual operator constructions, unscrew solenoid base sub−assembly first then follow step 3 for removal of parts.
5. For normal maintenance (cleaning) it is not necessary to disassemble the manual operator unless an ASCO Rebuild Kit is being installed. To disassemble, remove stem pin, manual operator stem, stem spring and stem gaskets (2).

- ***For DC construction (standard or with manual operator), proceed as follows:***

6. Unscrew solenoid base sub−assembly first then follow step 3 and 5 for removal of parts.

Note: Diaphragm spring is omitted for DC construction.

7. All Parts are now accessible for cleaning or replacement. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

Valve Reassembly

1. Lubricate body gasket and solenoid base gasket with DOW CORNING® 200 Fluid lubricant or an equivalent high−grade silicone fluid.
2. Lubricate manual operator stem gaskets (2) with DOW CORNING® 111 Compound lubricant or an equivalent high−grade silicone grease.
3. Replace body gasket and diaphragm assembly. Locate bleed hole in diaphragm assembly approximately 45° from valve outlet.

- ***For AC construction (standard or with manual operator), proceed as follows:***

4. Position diaphragm spring on diaphragm assembly. Be sure ***large end*** of diaphragm spring seats in cup of diaphragm assembly. For manual operator constructions, ***small end*** of diaphragm spring seats in cup of diaphragm assembly.
5. Install wide end of core spring in core assembly first, closed end protrudes from top of core assembly.
6. For standard construction, position core assembly with core spring and solenoid base sub−assembly (integral with bonnet) over diaphragm spring and diaphragm assembly.
7. Install bonnet screws and hand thread screws as far as possible, then torque bonnet screws in a crisscross manner to 95 ± 10 in−lbs [10,7 ± 1,1 Nm].
8. For valve constructions with a manual operator, first install valve bonnet and bonnet screws as described in step 7.
9. Install solenoid base gasket, core assembly with core spring and solenoid base sub−assembly.
10. Torque solenoid base sub−assembly to 175 ± 25 in−lbs [19,8 ± 2,8 Nm].
11. For valves with a manual operator proceed as follows:
    A. Install two manual operator stem gaskets on stem. Refer to Step 2 for lubrication instructions.
    B. Install stem spring and stem assembly with gaskets into valve bonnet.
    C. Push stem assembly into valve bonnet; align stem pin hole and install stem pin.
    D. Operate manual operator to be sure there is no misalignment or binding. Then rotate manual operator stem counterclockwise as far as possible.

- ***For DC construction (standard or with manual operator), proceed as follows:***

12. For standard or manual operator constructions, replace valve bonnet and follow steps 7, 9 and 10. For manual operator constructions, install core spring in core assembly following step 5.
13. Install solenoid. See separate instructions.

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests with a nonhazardous, noncombustible fluid.

14. Restore line pressure and electrical power supply to valve.
15. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic *click* signifies the solenoid is operating.

ORDERING INFORMATION FOR ASCO REBUILD KITS

Parts marked with an asterisk (*) in the exploded view are supplied in Rebuild Kits. When Ordering Rebuild Kits for ASCO valves, order the Rebuild Kit number stamped on the valve nameplate. If the number of the kit is not visible, order by indicating the number of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

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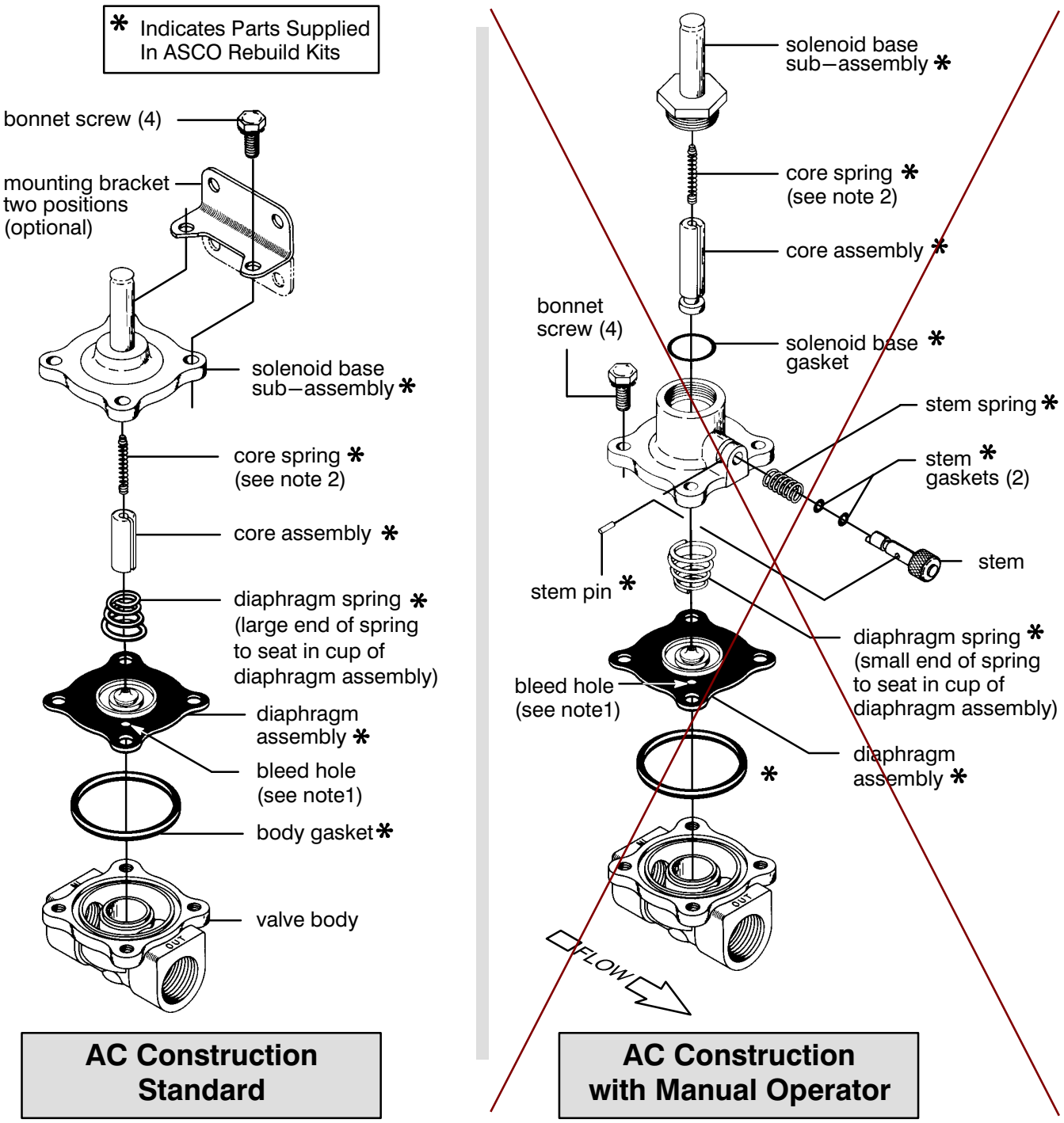
Torque Chart

Part Name	Torque Value Inch–Pounds	Torque Value Newton–Meters
Solenoid base sub–assembly	175 ± 25	19,8 ± 2,8
Bonnet screws	95 ± 10	10,7 ± 1,1



Note:

1. Locate bleed hole in diaphragm assembly approximately 45° from valve outlet.
2. Wide end of core spring in core first, closed end protrudes from top of core.

Figure 2. Series 8210 – AC construction without solenoid.

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GB CE

GENERAL INSTALLATION AND MAINTENANCE INSTRUCTIONS

Note: These General Installation and Maintenance Instructions must be read in conjunction with the Instruction Sheet for the specific product.

INSTALLATION

ASCO/JOUCOMATIC components are intended to be used only within the technical characteristics as specified on the nameplate. Changes to the equipment are only allowed after consulting the manufacturer or its representative. Before installation depressurize the piping system and clean internally.
The equipment may be mounted in any position if not otherwise indicated on the product by means of an arrow.
The flow direction and pipe connection of valves are indicated on the body.

The pipe connections have to be in accordance with the size indicated on the nameplate and fitted accordingly.
Caution:

- Reducing the connections may cause improper operation or malfunctioning.
- For the protection of the equipment install a strainer or filter suitable for the service involved in the inlet side as close to the product as possible.
- If tape, paste, spray or a similar lubricant is used when tightening, avoid particles entering the system.
- Use proper tools and locate wrenches as close as possible to the connection point.
- To avoid damage to the equipment, DO NOT OVERTIGHTEN pipe connections.
- Do not use valve or solenoid as a lever.
- The pipe connections should not apply any force, torque or strain to the product.

ELECTRICAL CONNECTION

In case of electrical connections, they are only to be made by trained personnel and have to be in accordance with the local regulations and standards.
Caution:

- Turn off electrical power supply and de-energize the electrical circuit and voltage carrying parts before starting work.
- All electrical screw terminals must be properly tightened according to the standards before putting into service.
- Dependent upon the voltage electrical components must be provided with an earth connection and satisfy local regulations and standards

The equipment can have one of the following electrical terminals:

- Spade plug connections according to ISO-4400 or 3 x DIN-46244 (when correctly installed this connection provides IP-65 protection).
- Embedded screw terminals in metal enclosure with "Pg" cable gland.
- Spade terminals (AMP type).
- Flying leads or cables.

PUTTING INTO SERVICE

Before pressurizing the system, first carry-out an electrical test. In case of solenoid valves, energize the coil a few times and notice a metal click signifying the solenoid operation.

SERVICE

Most of the solenoid valves are equipped with coils for continuous duty service. To prevent the possibility of personal or property damage do not touch the solenoid which can become hot under normal operation conditions.

SOUND EMISSION

The emission of sound depends on the application, medium and nature of the equipment used. The exact determination of the sound level can only be carried out by the user having the valve installed in his system.

MAINTENANCE

Maintenance of ASCO/JOUCOMATIC products is dependent on service conditions. Periodic cleaning is recommended, the timing of which will depend on the media and service conditions. During servicing, components should be examined for excessive wear. A complete set of internal parts is available as a spare parts or rebuild kit. If a problem occurs during installation/maintenance or in case of doubt please contact ASCO/JOUCOMATIC or authorised representatives.

A separate Declaration of Incorporation relating to EEC-Directive 89/392/EEC Annex II B is available on request. Please provide product identification number and serial numbers of products concerned.
The product complies with the essential requirements of the EMC Directive 89/336/EEC and amendments and the Low Voltage directives 73/23/EEC and 93/68/EEC. A separate Declaration of Conformity is available on request. Please provide product identification number and serial numbers of the products concerned.

FR CE

INSTRUCTIONS GÉNÉRALES D'INSTALLATION ET D'ENTRETIEN

Nota : Ces instructions générales d'installation et d'entretien complètent la notice spécifique du produit.

MONTAGE

Les composants ASCO/JOUCOMATIC sont conçus pour les domaines de fonctionnement indiqués sur la plaque signalétique ou la documentation. Aucune modification ne peut être réalisée sur le matériel sans l'accord préalable du fabricant ou de son représentant. Avant de procéder au montage, dépressuriser les canalisations et effectuer un nettoyage interne.
A moins qu'une flèche ou la notice n'indique un sens de montage spécifique de la tête magnétique, le produit peut être monté dans n'importe quelle position.
Le sens de circulation du fluide est indiqué par repères sur le corps et dans la documentation.

La dimension des tuyauteries doit correspondre au raccordement indiqué sur le corps, l'étiquette ou la notice.
Attention :

- Une restriction des tuyauteries peut entraîner des dysfonctionnements.
- Afin de protéger le matériel, installer une crépine ou un filtre adéquat en amont, aussi près que possible du produit.
- En cas d'utilisation de ruban, pâte, aérosol ou autre lubrifiant lors du serrage, veiller à ce qu'aucun corps étranger ne pénètre dans le circuit.
- Utiliser un outillage approprié et placer les clés aussi près que possible du point de raccordement.
- Afin d'éviter toute détérioration, NE PAS TROP SERRER les raccords des tuyauteries.
- Ne pas se servir de la vanne ou de la tête magnétique comme d'un levier.
- Les tubes de raccordement ne devront exercer aucun effort, couple ou contrainte sur le produit.

RACCORDEMENT ÉLECTRIQUE

Le raccordement électrique doit être réalisé par un personnel qualifié et selon les normes et règlements locaux.
Attention :

- Avant toute intervention, couper l'alimentation électrique pour mettre hors tension les composants.
- Toutes les bornes à vis doivent être serrées correctement avant la mise en service.
- Selon la tension, les composants électriques doivent être mis à la terre conformément aux normes et règlements locaux.

Selon les cas, le raccordement électrique s'effectue par :

- Connecteur débrochable ISO4400 ou 3 x DIN46244 avec degré de protection IP65 lorsque le raccordement est correctement effectué.
- Bornes à vis solidaires du bobinage, sous boîtier métallique avec presse-étoupe "Pg - -".
- Cosses (type AMP).
- Fils ou câbles solidaires de la bobine.

MISE EN SERVICE

Avant de mettre le circuit sous pression, effectuer un essai électrique. Dans le cas d'une électrovanne, mettre la bobine sous tension plusieurs fois et écouter le "clic" métallique qui signale le fonctionnement de la tête magnétique.

FONCTIONNEMENT

La plupart des électrovannes comportent des bobinages prévus pour mise sous tension permanente. Pour éviter toute brûlure, ne pas toucher la tête magnétique qui, en fonctionnement normal et en permanence sous tension, peut atteindre une température élevée.

BRUIT DE FONCTIONNEMENT

Le bruit de fonctionnement varie selon l'utilisation, le fluide et le type de matériel employé. L'utilisateur ne pourra déterminer avec précision le niveau sonore émis qu'après avoir monté le composant sur l'installation.

ENTRETIEN

L'entretien nécessaire aux produits ASCO/JOUCOMATIC varie avec leurs conditions d'utilisation. Il est souhaitable de procéder à un nettoyage périodique dont l'intervalle varie suivant la nature du fluide, les conditions de fonctionnement et le milieu ambiant. Lors de l'intervention, les composants doivent être examinés pour détecter toute usure excessive. Un ensemble de pièces internes est proposé en pièces de rechange pour procéder à la réfection. En cas de problème lors du montage/entretien ou en cas de doute, veuillez contacter ASCO/JOUCOMATIC ou ses représentants officiels.

Conformément à la directive CEE 89/392/CEE Annexe II B, une Déclaration d'incorporation peut être fournie sur demande. Veuillez nous indiquer le numéro d'accusé de réception (AR) et les références ou codes des produits concernés.
Ce produit est conforme aux prescriptions les plus importantes de la directive CEM 89/336/CEE et amendements et aux directives basse tension 73/23/CEE et 94/68/CEE. Une déclaration de conformité peut être fournie sur simple demande. Veuillez nous indiquer le numéro d'accusé de réception (AR) ainsi que les numéros de série des produits concernés.

DE CE

ALLGEMEINE BETRIEBSANLEITUNG

ACHTUNG: Diese Allgemeine Betriebsanleitung gilt in Zusammenhang mit der jeweiligen Betriebsanleitung für die speziellen Produkte.

EINBAU

Die ASCO/JOUCOMATIC-Komponenten dürfen nur innerhalb der auf den Typenschildern angegebenen Daten eingesetzt werden. Veränderungen an den Produkten sind nur nach Rücksprache mit ASCO/JOUCOMATIC zulässig.
Vor dem Einbau der Ventile muß das Rohrleitungssystem drucklos geschaltet und innen gereinigt werden.
Die Einbaulage der Produkte ist generell beliebig. **Ausnahme:** Die mit einem Pfeil gekennzeichneten Produkte müssen entsprechend der Pfeilrichtung montiert werden.
Die Durchflußrichtung und der Eingang von Ventilen sind gekennzeichnet.

Die Rohranschlüsse sollten entsprechend den Größenangaben auf den Typenschildern mit handelsüblichen Verschraubungen durchgeführt werden. **Dabei ist folgendes zu beachten:**

- Eine Reduzierung der Anschlüsse kann zu Leistungs- und Funktionsminderungen führen.
- Zum Schutz der Ventile sollten Schmutzfänger oder Filter so dicht wie möglich in den Ventileingang integriert werden.
- Bei Abdichtung am Gewinde ist darauf zu achten, daß kein Dichtungsmaterial in die Rohrleitung oder das Ventil gelangt.
- Zur Montage darf nur geeignetes Werkzeug verwendet werden.
- Konische Verschraubungen sind sorgfältig anzuziehen. Es ist darauf zu achten, daß beim Anziehen das Gehäuse nicht beschädigt wird.
- Spule und Führungsrohr von Ventilen dürfen nicht als Gegenhalter benutzt werden.
- Die Rohrleitungsanschlüsse sollen fluchten und dürfen keine Spannungen auf das Ventil übertragen.

ELEKTRISCHER ANSCHLUß

Der elektrische Anschluß ist von Fachpersonal entsprechend den geltenden VDE- und CEE-Richtlinien auszuführen. **Es ist besonders auf folgendes zu achten:**

- Vor Beginn der Arbeiten ist sicherzustellen, daß alle elektrischen Leitungen und Netzteile spannungslos geschaltet sind.
- Alle Anschlußklemmen sind nach Beendigung der Arbeiten vorschriftsmäßig entsprechend den geltenden Regeln anzuziehen.
- Je nach Spannungsbereich muß das Ventil nach den geltenden Regeln einen Schutzleiteranschluß erhalten.

Der Magnetantrieb kann je nach Bauart folgende Anschlüsse haben:

- Anschluß für Gerätesteckdose nach DIN 43650 Form A/ISO 4400 oder 3x DIN 46244 (durch ordnungsgemäße Montage der Gerätesteckdose wird Schutzklasse IP 65 erreicht).
- Anschlüsse innerhalb eines Blechgehäuses mittels Schraubklemmen. Kabeleinführung ins Gehäuse mit PG-Verschraubung.
- Offene Spulen mit Flachsteckern (AMP-Fahnen) oder mit eingegossenen Kabelenden.

INBETRIEBNAHME

Vor Druckbeaufschlagung des Produktes sollte eine elektrische Funktionsprüfung erfolgen:
Bei Ventilen Spannung an der Magnetspule mehrmals ein- und ausschalten. **Es muß ein Klicken zu hören sein.**

BETRIEB

Die meisten Ventile sind mit Spulen für Dauerbetrieb ausgerüstet. Zur Vermeidung von Personen- und Sachschäden sollte jede Berührung mit dem Ventil vermieden werden, da die Magnetspule bei längerem Betrieb sehr heiß werden kann.

GERÄUSCHEMISSION

Diese hängt sehr stark vom Anwendungsfall, den Betriebsdaten und dem Medium, mit denen das Produkt beaufschlagt wird, ab. Eine Aussage über die Geräuschemission des Produktes muß deshalb von demjenigen getroffen werden, der das Produkt innerhalb einer Maschine in Betrieb nimmt.

WARTUNG

Die Wartung hängt von den Einsatzbedingungen ab. In entsprechenden Zeitabständen muß das Produkt geöffnet und gereinigt werden. Für die Überholung der ASCO/JOUCOMATIC-Produkte können Ersatzteilsätze geliefert werden. Treten Schwierigkeiten bei Einbau, Betrieb oder Wartung auf, sowie bei Unklarheiten, ist mit ASCO/JOUCOMATIC Rücksprache zu halten.

(ASCO/JOUCOMATIC Produkte sind entsprechend der EG-Richtlinie 89/392/EWG gefertigt.

Eine separate Herstellererklärung im Sinne der Richtlinie 89/392/EWG Anhang IIB ist auf Anfrage erhältlich. Geben Sie bitte für die Produkte die Nummer der Auftragsbestätigung und die Seriennummer an.

Dieses Produkt entspricht den grundlegenden Bestimmungen der EMV-Richtlinie 89/336/EWG, einschl. Nachtrage, sowie den Niederspannungsrichtlinien 73/23/EWG u. 93/68/EWG. Bitte geben Sie die Auftragsbestätigungsnummer und die Seriennummern der betreffenden Produkte an.

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