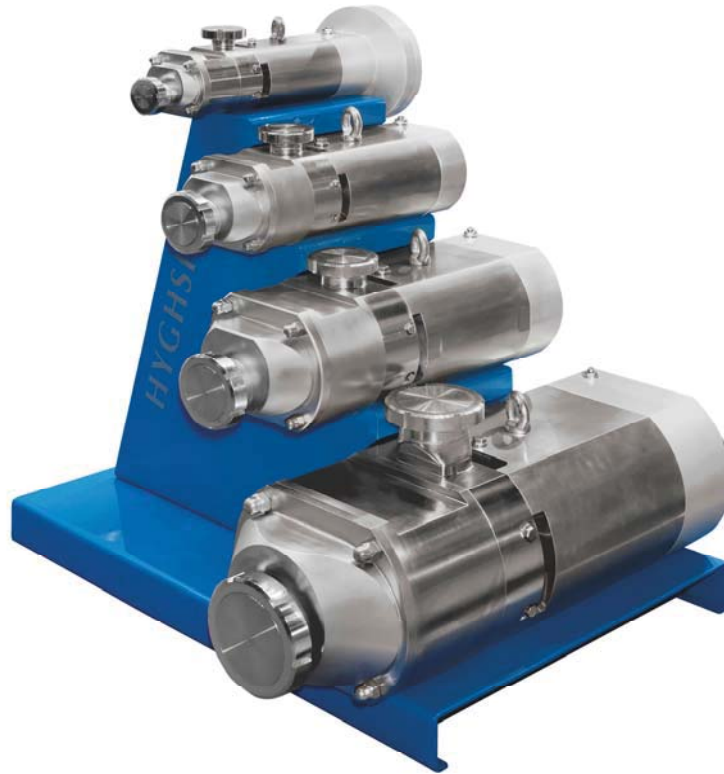


Operating Instructions

AXIFLOW Twin Screw Pump



AXIFLOW 
TECHNOLOGIES, INC.

Axiflow Technologies Inc.
1955 Vaughn Road, Suite 103
Kennesaw, Georgia 30144

Tel.: 1-800-AXIFLOW (294-3569)
Fax: 1-877-569-0775
www.axiflowtechnologies.com

Pump Model: STSC 90-38 DBL Pump Serial Number:

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1. General Information

1.1 Information about these operating instructions

These operating instructions contain basic instructions for installation, operation and servicing. They must read before installation and initial start-up by the responsible user/operator and must always be available at the installation location since no liability will be assumed for any damage or operational malfunctions arising from non-compliance with these operating instructions.

1.2 Intended use

The pump is solely to be used for the pumping of the media agreed in the order datasheet. Any other application that goes beyond the intended use or conversion of the pump without written agreement with the manufacturer shall be deemed to be not in accordance with the intended use.

The pump may only be started up for the first time if it has been ensured that all safety devices are completely fitted and functional.

In areas subject to risk of explosion only pumps designed to the relevant explosion-proof specification may be used.

Intended use also covers compliance with the conditions of operation, servicing and maintenance specified by the manufacturer.

The pump is only capable of dry running for a short time. The occurrence of dry running phases should therefore be avoided or agreed in advance with the manufacturer.

The pump is only to be put into operation filled with medium to be pumped.

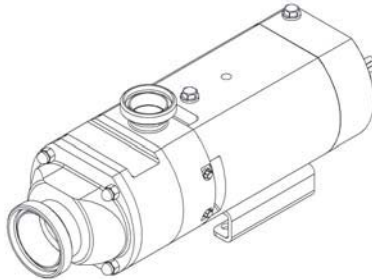
Before starting up ensure that:

- the valves on the inlet side open completely (to avoid cavitation)
- the valves on the outlet side open completely (to avoid exceeding the permitted differential pressure of the pump)
- outlet-side safety measures are taken (e.g. safety valve) to protect the pump from non-permitted excess pressure

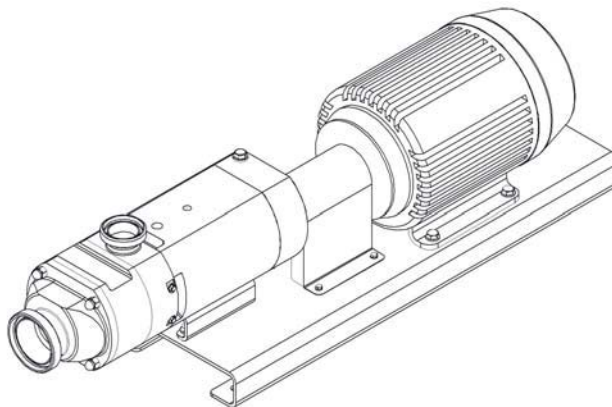
1.3 Scope of supply

The pump can:

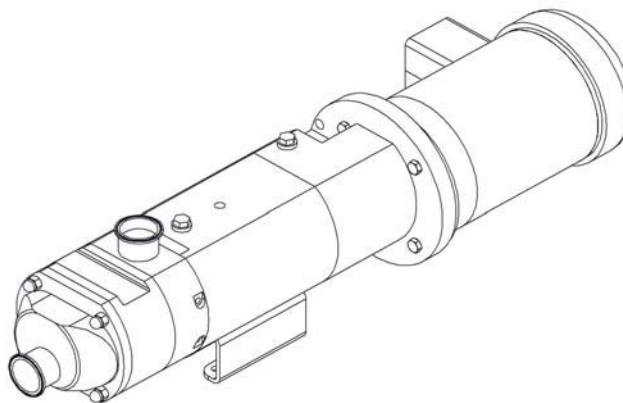
- be ordered with a free shaft end, i.e. the pump is supplied without motor or baseplate,



- be ordered as an assembled unit, i.e. ready-assembled on baseplate with drive motor, coupling and coupling protection



- with Nema C-Face design, i.e. pump with flange-fitted motor



Immediately on receipt of the pump, ensure it is complete and report any damage or defects to the delivery company.

1.4. Other applicable documents

Pump datasheet	Technical data, conditions for use, performance and operating limits
Dimensional drawing	Designation of components and connections
Spare parts lists	Spare parts ordering
Supplementary sheet	Mechanical seal system technical data
Disassembly/assembly instructions	Disassembly and assembly of the pump
Vendor documentation	Technical documentation for vendor parts

2 Safety

2.1 General information

The pump is only to be operated when in perfect working order. It is also only to be operated in accordance with its intended use and with regard to safety and risk aspects in compliance with these instructions.

Instructions attached to the machine shall be maintained in their entirety and legibly.

Working methods that endanger personnel or non-involved third parties shall be avoided.

In the event of safety-relevant malfunctions, the pump shall be shut down immediately and the malfunction shall be rectified by the responsible person.

The safety regulations of the relevant operator country also apply.

The pump has to be protected against access by non-qualified personnel.

2.2 Risks resulting from non-compliance with the safety instructions

Non-compliance with the safety instructions can cause a risk to individuals, the environment and to the pump itself.

2.3 Installation, operating and maintenance personnel

Installation, operating and maintenance personnel are those persons who are responsible for the shipment, assembly, installation, operation, cleaning and correction of problems.

The operator must ensure that authorized and properly qualified personnel perform all maintenance, operating and installation activities.

Work on the system should only be performed when it is shut down. Immediately following the conclusion of such work, all safety and protective devices must be made functional.

2.4 Safety devices

Ensure provision of the following safety devices and their functionality:

- For hot, cold and moving parts: provide on-site protection against accidental contact with the pump, which must not be removed during operation
- For possible electrostatic discharge: provide relevant grounding system
- Provide suitable pressure relief devices to prevent outlet-side excess pressure between the pump and the first shut-off device

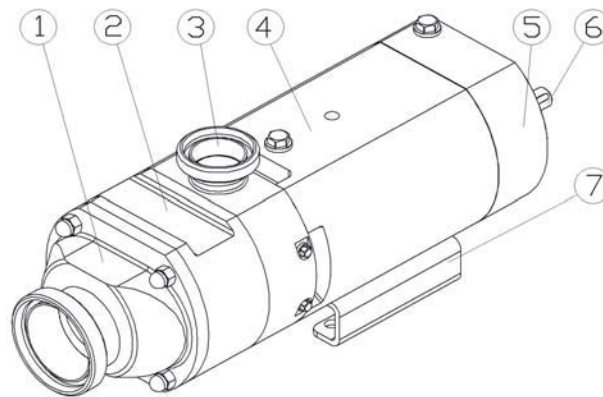
2.5 Conversion of the system/pump and use of spare parts

Modifications or conversions of the system/pump will only be warranted following agreement with the manufacturer.

For safety and functional reasons, spare parts from the manufacturer shall only be used. The use of other parts voids any warranty and excludes liability for any resulting consequences.

3 Design and Mode of Operation

3.1 Pump design



The following parts of the pump are visible externally:

1 – Cover with connector (normally inlet)

2 – Pump casing

3 – Intermediate flange with connector (normally outlet)

4 – Bearing casing

5 – Gear casing

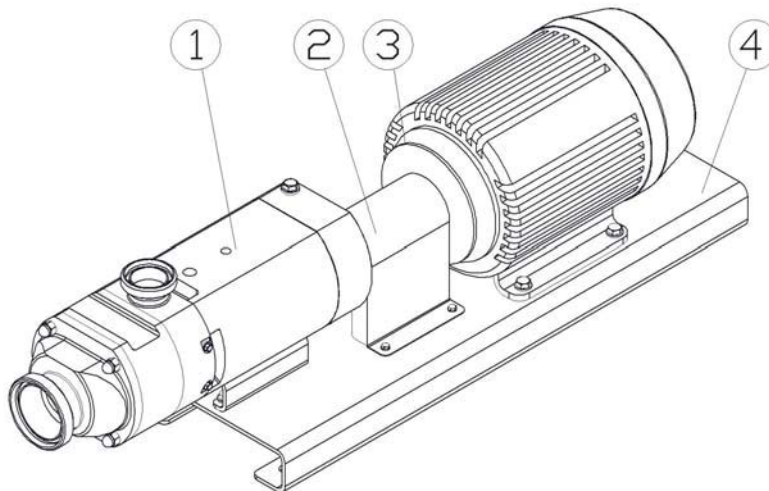
6 – Drive shaft

7 – Pump console

With Nema C-Face type pumps, the drive shaft is not visible as the drive unit is flange-mounted directly to the gear casing.

Under certain circumstances, the direction of flow can be reversed. In such cases, #1 is the outlet nozzle and #3 is the inlet nozzle.

3.2 Design of the pump assembly unit



A pump assembly unit consists of the following parts:

1 – Pump

2 – Coupling and coupling protection

3 – Drive unit

4 – Console

3.3 Mode of operation of the pump

AXIFLOW pumps are externally mounted bearings, single entry, twin-screw pumps. The pumping elements move the medium from the pump inlet to the outlet without coming into contact with it. Reverse operation is possible (see assembly/disassembly instructions).



The product chamber is separated from the environment by shaft seals.

The following shaft seals can be fitted:

- Single-acting mechanical seal without shaft seal ring
- Single-acting mechanical seal with shaft seal ring and pressureless quench
- Double-acting mechanical seal with quench or barrier system

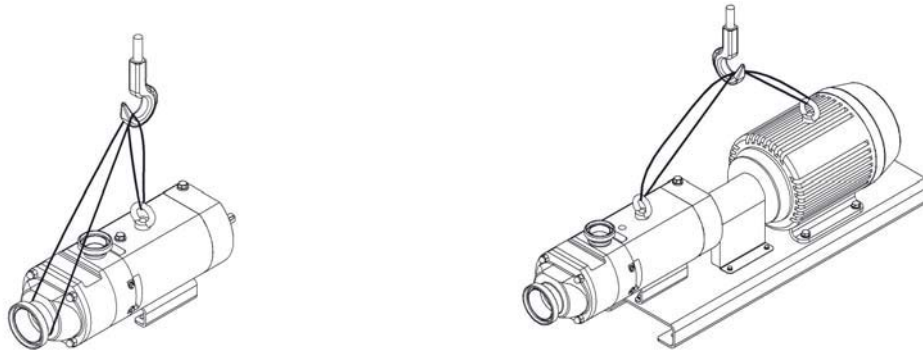
3.4 Nameplate

The nameplate is fixed to the bearing casing. Example:

AXIFLOW  TECHNOLOGIES, INC. www.axiflowtechnologies.com		1955 VAUGHN ROAD SUITE 103 KENNESAW, GEORGIA 30144 TELEPHONE: (800) 889-5699 FAX: (877) 569-0775		 02-10
Order No.		Serial No.		
PTS 1111013		11211-001		
Model No.		Tag No.		
STS 90-38		Barbecue Sauce Transfer		
Product		Viscosity		
Barbecue Sauce/CIP		1 - 1,500 CST		
Flowrate		Speed		
60 - 125 GPM		747 - 1,770 RPM		
Power Requirement		Max. Differential Pressure		
7.3 HP		40 PSIG		
Max. NPSH Requirement		Temperature		
2.86 FEET		80 - 180 DEG. F		

4 Transportation and Interim Storage

The pumps need to be transported and secured with care to ensure no damage is caused. Lifting equipment and load securing straps must be placed for the total weight of the pump/assembly unit. Attach lifting device as shown in the following diagrams:



Make sure you set the pump down on a sufficiently stable, horizontal surface.

If stored temporarily, the pump must not be exposed to the weather for any significant period of time. All openings shall be closed with blind flanges, blind plugs or plastic covers. Rotate shaft once a month to change the position of the bearings.

5 Erection and Installation

The NEMA additional instructions apply for pumps in areas subject to the risk of explosion.

Before fitting the motor, check the direction of rotation.

5.1 Fitting the pump on the unit console

Misalignments of the shafts of the pump and drive unit lead to increased wear for bearings, mechanical seals, shaft seal rings, elastic coupling elements and cause the unit to run unevenly.

The pump is aligned with the aid of a spirit level at the drive shaft and at the connecting piece of the intermediate flange.

When assembling the coupling, fit the keys and slide on the coupling halves without tilting.

Do not subject pump or motor components to any jolts or impacts.

Tighten the threaded pins at the coupling halves.

If there is any vertical, horizontal or angular displacement, align the motor precisely to the pump. For detailed information and for special couplings, please refer to the manufacturer's instructions.

Check the light gap over the two coupling halves at the circumference in two planes (at 90° to each other).

If there is a light gap, align the motor at the external diameter.

Check the axial gap between the coupling halves with a feeler gauge, compare with the permitted gap (dimensional drawing) and align if not correct. The axial gap between the coupling halves must be identical measured along the entire circumference.

Fit the coupling guard. If using a protective cover, ensure that there is a gap for ventilating the unit.

5.2 Piping

The installation of the piping must be stress-free and pressure-tight. It needs to be connected so that no forces or moments are transferred to the pump connections. The pump must not be used as a fixing point for the piping. The pipes shall be supported directly before the pump and connected without stress. Any changes in the length of piping resulting from temperature changes shall be compensated by suitable measures in order not to put load on the pump.

In order to avoid the formation of air pockets, the intake line shall be installed ascending, in case of positive intake pressure descending. The intake line shall be dimensioned so that as far as possible the flow speed does not exceed 1.5 m/sec in production mode.

Venting elements shall be provided at the intake and discharge sides.

Sudden changes to the cross-section and direction of the piping run are to be avoided.

Adapters to larger nominal widths should be designed with approx. 8° expansion angle in order to avoid increased pressure losses.

Before initial startup the tanks/containers, piping and connections shall be cleaned thoroughly in order to remove residual weld spatter, scale and other contaminants.

A non-return valve between the pressure nozzle and gate valve shall be used to ensure that the medium does not flow back after switching off the pump.

5.3 Electrical connection

A trained electrician shall perform the electrical connection.

Ensure correct direction of rotation

Before starting any works at the electrical equipment, the pump has to be de-energized and locked out against re-starting.

Connect the motor with suitable cable bushings in accordance with the wiring diagram – use of cable transversal sections according to the motor parameters.

The connecting cables have to be laid with protection devices. To avoid overheating, connect PTC thermistors of the standard motors, in case of need assemble motor protection switches.

When using other motors than those supplied, the user is self-responsible for safety and function.

6 Pump/System Operation

6.1 Initial startup

- Check gear lubrication and top up if necessary
- Prepare auxiliary operating systems if present
- Check seal system – follow additional instructions of the seal manufacturer
- Connect heating if present
- Connect cooling system if present
- If necessary, clean/sterilize pump
- Open valves in the intake and discharge lines
- Fill pump with pumping medium and check visually for leaks
- Vent lines
- Switch on motor and set operating speed
- After achieving the operating speed, check visually for leaks

6.2 Shutting down

- Switch off motor
- Check that it slows down smoothly
- If present, maintain the following functions
 - with double mechanical seals: barrier pressure until pump is depressurised
 - cooling water feed until pump operating temperature < 210 °F

- If the pump is not going to be used for a relatively lengthy period, close intake and discharge-side valves
- Switch off heating system if present
- If necessary, clean/sterilize pump

6.3 Restarting

Before restarting, check that the pump is running smoothly.

7 Servicing and Cleaning

The pump has to be de-energized during maintenances and repairs and locked out against re-starting.

7. 1 Maintenance

The pump should always operate smoothly and free of vibrations. The following conditions must be met for problem-free operation:

- Avoid dry running unless fitted with the proper seal flush
- Avoid cavitation – always keep shut-off devices in the intake line open during operation
- Ensure there are no leaks from the pump
- Ensure functionality of the auxiliary systems

The following has to be checked at regular intervals:

- Temperature of the bearing support (Alarm: 230°F, switching off: 250°F)
- No change of operating conditions
- No change of noise level
- Condition and level of barrier medium

7.2 Inspection and maintenance table

Inspection interval	Subassembly	Maintenance activity
Hourly during the start-up phase	Barrier pressure system	Check barrier medium level, adjust if necessary
Daily	Barrier pressure system	Check barrier medium level, adjust if necessary
Daily	Gear casing	Check gear oil level, top up if necessary
Daily	Mechanical seal	Check for leaks, if leaks are present, contact the manufacturer and replace if necessary.
Daily	Shaft seal rings	Check for leaks, if leaks are present, contact the manufacturer and replace if necessary.
Daily	Barrier/quench system	Check function, top off if necessary. If contamination is present, check mechanical seal and replace barrier/quench fluid
Daily	Heating/cooling system	Check function and freedom from leaks
Weekly	Drive unit	Check for wear in accordance with manufacturer's instructions
Initially after 300 operating hours or 3 months	Gear casing	Change gear oil
With non-continuous operation, every 2000 hours or after 3 months	Gear casing	Change gear oil
With continuous operation, every 3000 operating hours	Gear casing	Change gear oil
6 months	Barrier pressure system	Change barrier medium

7.2.1 Changing the lube oil

- Undo drain screw on the gear casing and drain lube oil at warm operating temperature
- Refit drain screw with new seal
- Undo locking screw on bearing casing and venting screw on gear casing and top up with lube oil until the oil level reaches the middle of the oil level eye
- Refit locking screw on bearing casing and venting screw on gear casing.

The following gear oils are suitable for foodstuff and pharmacy products:

Gear oil with NSF or USDA HI certification

Synthetic oil with polyalpholefin, not mixable with mineral oils

CAUTION

Risk of damage to equipment is possible if non-compatible lubricants are used!

Only use one type of lubricant. Do not mix lubricants.

7.2.2 Lubricant table

Manufacturer	Gear oil
Aral/Castrol/Opti	Optileb GT100
Esso	See Mobil
Fuchs/DEA	Geralyn SF100/Cassida HF 100
Klüber	Klüberoil 4 UH1-100N
Mobil	MOBIL DTE FM100

7.3 Cleaning/sterilising

7.3.1 CIP cleaning at CIP temperature < 180 °F

- The pump is switched off
- In the case of pumps with barrier system: barrier system in operation
- Switch piping system to CIP medium

- Start pump
- Clean piping system and pump
- Switch off pump
- Remove CIP medium, ensure no residues are left
- If necessary, flush and neutralise system

7.3.2 CIP cleaning/sterilizing at CIP temperature > 180 °F with barrier system or quench system

- The pump is switched off
- Start barrier/quench system
- Warm up pump when at standstill
- Switch piping system to CIP medium
- Wait till casing temperature > 140 °F
- Start the pump
- Clean piping system and pump
- Switch off pump
- Remove CIP medium, ensure no residues are left
- If necessary, flush and neutralize system

7.3.2 CIP cleaning/sterilizing at CIP temperature > 180 °F without barrier system or quench system

- The pump is switched off
- Only clean/sterilise pump when at standstill
- Cleaning duration < 30 minutes
- When cleaning/sterilising using steam, block the pump as a turbine effect can occur
- Switch piping system to CIP medium
- Clean piping system and pump
- Remove CIP medium, ensure no residues are left

- Undo block
- If necessary, flush and neutralize system

7.3.4 Mechanical cleaning/sterilizing

- Switch off pump and make sure it cannot be switched on again
- Close intake and discharge-side valves
- Switch off heating/cooling system if present, make sure it cannot be switched on again
- Switch off auxiliary operating systems if present, make sure they cannot be switched on again
- Depressurise pump and auxiliary operating systems
- Undo intake and discharge lines from pump casing
- Remove pump casing
- Undo fixing bolts
- Remove form sealing rings from the intermediate flange and cover
- Clean/sterilize pump casing and pump internals with suitable cleaning agent
- Fit form sealing rings
- Tighten fixing bolts
- Slide pump casing over the screws and tighten down cover.

8 Malfunctions / causes / rectification

No delivery volume	Delivery volume too low	Delivery volume too large	No pump suction	Not running smoothly	Pump will not rotate	Pump has leak	Power input for motor too high	Non-permitted temperature increase	Cause	Rectification
x	x			x			x	x	Pressure difference too great	Modify operating data
x	x		x					x	Clearance between pumping elements and casing too great	Replace worn parts
x			x						Incorrect direction of rotation	Change direction of rotation
x	x		x					x	Speed too low	Increase speed
x	x		x	x					Feed line closed	Open feed line (valve)
x	x		x						Air is sucked in	Seal intake Increase speed
x	x		x	x					Pump cavitation: $NPSH_r < NPSH_a$	Improve feed line Reduce speed
x			x	x			x	x	Pressure line closed	Open pressure line
x			x		x		x		Pump blocked by solid matter	Clean pump Coordinate with manufacturer
x	x	x	x	x			x	x	Operating conditions deviate from datasheet	Coordinate with manufacturer
		x		x			x	x	Speed too high	Reduce speed
x	x		x			x			Shaft seal defective	Replace shaft seal
x			x						Pump not filled before start	Fill pump
				x					Oil level in gear casing too low	Correct oil level
			x			x			Casing moulded ring defective	Replace moulded ring
				x	x		x		Piping and pump twisted	Optimise piping
				x	x		x		Pumping elements dirty	Clean pumping elements
				x	x				Coupling not aligned	Align coupling
				x	x		x		Thermal expansion of pumping elements because of rapid temperature fluctuations	Wait for temperature equalisation
					x		x		Roller bearings defective	Replace roller bearings

9 Servicing, spare parts, accessories

Spare parts not supplied by the manufacturer directly or through distribution are not approved. The use of such parts can change the characteristics of the pump and will void any warranty.

No liability or warranty claims shall be accepted for any damage arising from the use of non-original spare parts and accessories. The service department of the manufacturer may only rectify malfunctions that cannot be rectified by the user.

Spare parts can be ordered either through distribution or directly. The supplied drawings are designed only for the identification of spare parts and spare part procurement. They must not be used as installation instructions.

Appendix

This certificate must be filled out and sent with any repair in order to ensure that the pump is dealt with correctly.

Compliance certificate

The pump and its accessories sent for repair/inspection together with this compliance certificate:

Type:

Serial no.:

Reason for request for inspection/repair:

- ☐ has not been used for / in fluids that are dangerous to health
- ☐ was used for and came into contact with fluids subject to mandatory labelling or were contaminated with harmful substances.

Please state last pumping medium:

The pump was carefully emptied before shipping / dispatch and has been cleaned inside and outside using the following cleaning agent

- ☐ No special safety precautions are necessary for subsequent handling.
- ☐ The following safety precautions with regard to rinsing liquids, residual fluids and disposal are required:

We assure that the above statements are correct and complete and that the pump is being shipped in accordance with statutory regulations.

Company:

Department/contact person:

Tel:

Fax:

Address:

Street:

Town/postcode:

Declaration of Conformity

In terms of CE Machine's Directive 2006/42/EG, Appendix II A

Company: Jung Process Systems GmbH
Auweg 2
25495 Kummerfeld
Germany

Pump Series: HYGHSPIN (AXIFLOW)

We herewith declare that the pump delivered with already assembled electrical drive motor corresponds to the following relevant regulations:

CE Machine's Directive 2006/42/EG

CE Low Voltage Directive 73/23/EWG

The following harmonized norms have been applied:

EN 12100 Safety of Machines

EN 60204 Electrical Equipment of Machines

This declaration expires in case modifications of the pump unit have been effected without our prior acceptance.



(Signature)

Declaration of Incorporation
In terms of CE Machine's Directive 2006/42/EG, Appendix II B

Company: Jung Process Systems GmbH
Auweg 2
25495 Kummerfeld
Germany

Pump Series: HYGHSPIN (AXIFLOW)

We herewith declare that the pump delivered without drive motor is dedicated for assembly into a machine or for assembly to a complete unit with other machines.

The commissioning of this pump is prohibited until that date when it has been confirmed that the machine - into this pump was integrated – corresponds to the regulations of the CE Directive 2006/42/EG .

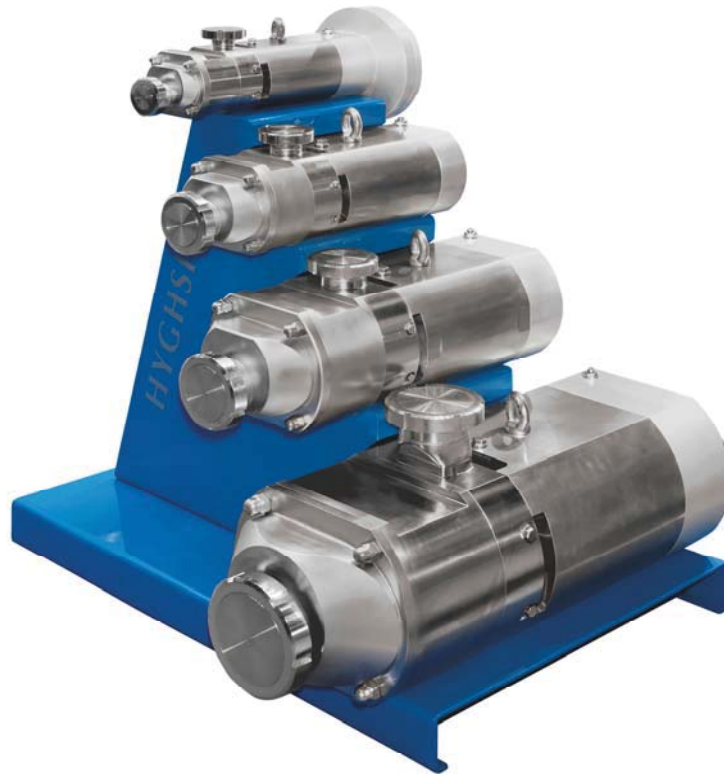
This declaration expires in case modifications of the pump have been effected without our prior acceptance.


(Signature)

Disassembly & Assembly Instructions

AXIFLOW

Twin Screw Pump



AXIFLOW 
TECHNOLOGIES, INC.

Axiflow Technologies Inc.
1955 Vaughn Road, Suite 103
Kennesaw, Georgia 30144

Tel.: 1-800-AXIFLOW (294-3569)
Fax: 1-877-569-0775
www.axiflowtechnologies.com

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2 Removal of the pump from the unit.....	3
3 Disassembling the feed screws and mechanical seals	3
4 Assembling the feed screws and mechanical seals	4
5 Removing the bearing support.....	6
6 Assembling bearing support.....	7
Appendix A	10

1 General information

These instructions are designed to be used in conjunction with the sectional drawing.

For reasons of economy and operational safety the following parts should not be reused:

- Flat gaskets (item 128)
- O-rings (at the mechanical seal)
- Shaped rings (items 103, 126 and the mechanical seal)
- Radial shaft seals (items 106, 117)
- Locking washers (item 109)
- Locking plate (item 119)
- Spring washers (items 113 and 114)

The materials and product compatibility of all ancillary products used (lubricants, cleaning agents, adhesives and securing devices) must be checked before use.

2 Removal of the pump from the unit

Switch off unit and make sure it cannot be switched on again.

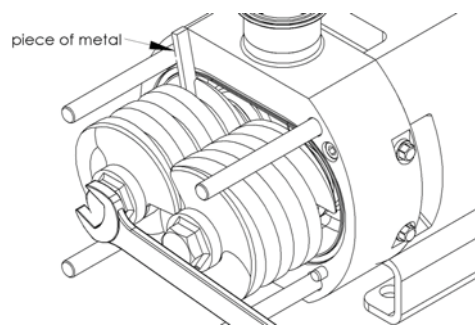
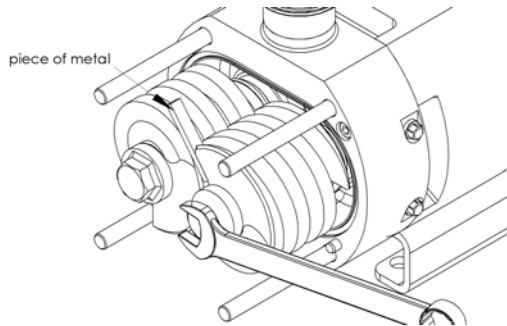
Important: Make sure you read the Safety Section in the Operating Instructions!

- Remove piping on the discharge and intake sides
- Remove the coupling protection
- Undo the pump-side coupling half from the drive shaft and pull the coupling apart
- Fix pump to crane with eye bolt or secure with crane harness
- Undo pump foot from baseplate. Caution – risk of tipping over!
- Lift pump and put down on a suitable surface
- Remove lifting gear.

3 Disassembling the feed screws and mechanical seals

- Remove cap nuts (item 100) and cover (item 1) and pump casing (item 2)
- Remove casing shaped rings (item 103)

- Block feed screws with the aid of a piece of soft metal (copper, aluminium etc.)



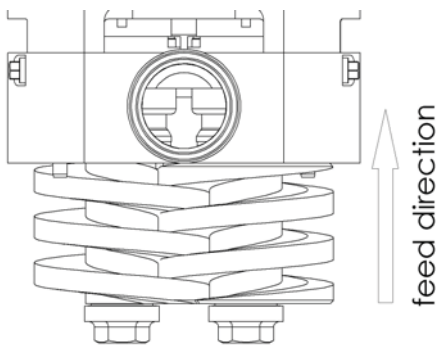
- Undo clamping nuts (item 18) by turning counter-clockwise
- Remove bottom stud bolts (item 9)
- Remove pair of feed screws (item 6)
- Upon removal of feed screws, inspect clamping nuts, stud bolts and shafts for the presence of the soil and/or product residue. See Appendix A, Item 2 for the cleaning procedure.
- Remove rotating units of the mechanical seals
- Remove socket head bolts (item 102)
- Remove intermediate flange (item 3)
- Remove top stud bolts (item 9)
- In the case of double-acting mechanical seals (item 104), remove seal rings from the shafts
- Remove socket-head bolts for mechanical seals at the intermediate flange (item 3)
- Remove mechanical seals (item 104) from the intermediate flange (item 3). If necessary, use set/jacking screws

4 Assembling the feed screws and mechanical seals

For tightening torques, see table (page 10).

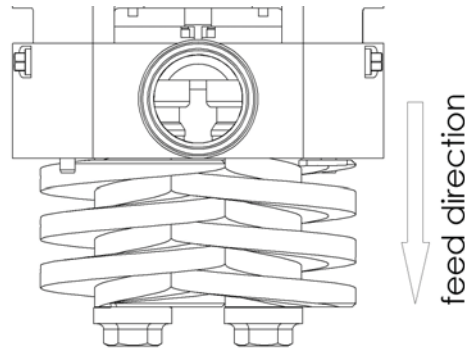
- Check sliding surfaces of the mechanical seals for score marks and cracks
- Insert mechanical seals (item 104) in the intermediate flange (item 3)
- Screw mechanical seal Housings to intermediate flange (item 3) with socket-head bolts
- In the case of double-acting mechanical seals (item 104), mount rotating seal rings on the shafts

- Screw in 2 stud bolts (item 9) for guidance of the intermediate flange (do not insert completely)
- Fit casing shaped ring (item 103)
- Mount intermediate flange (item 3)
- Remove stud bolts again (item 9)
- Mount rotating units of the mechanical seals
- Position feed screws on a level surface so that they intermesh and rotate them against each other until both faces lie completely even on the surface



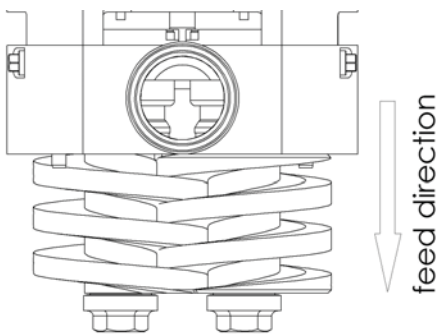
Type NR

Feed screws with rightward rotation with mechanical seal on the discharge side, "VS" on bottom of the pump casing



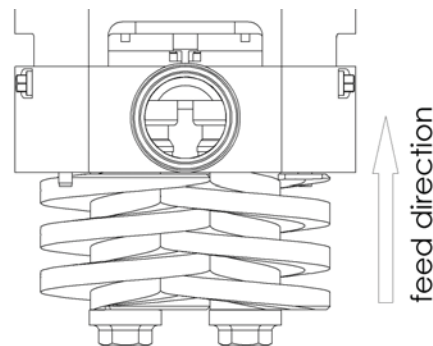
Type SR

Feed screws with rightward rotation with mechanical seal on the intake side, "VS" on bottom of the pump casing



Type SL

Feed screws with leftward rotation with mechanical seal on the intake side, "VS" on top of the pump casing



Type NL (Standard)

Feed screws with leftward rotation with mechanical seal on the discharge side, "VS" on top of the pump casing

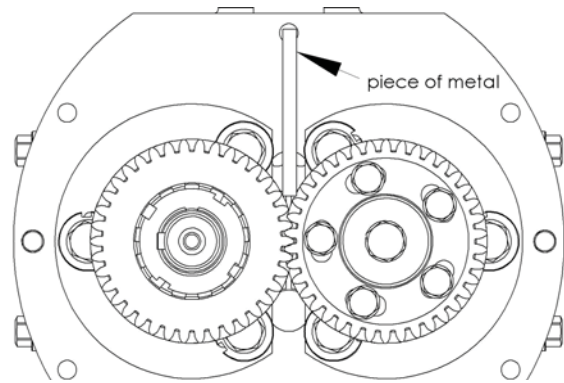
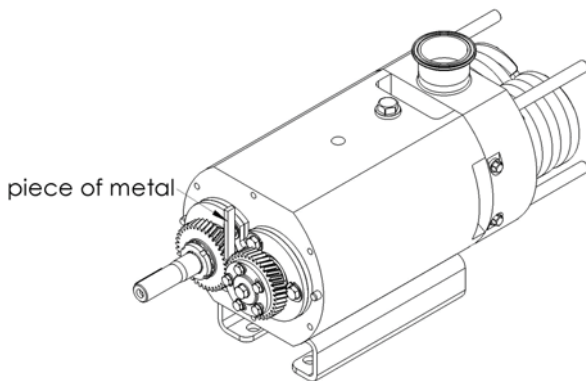
Important: All rotation references are as if you are facing the shaft end of the pump.

Important: The feed screws must not be swapped, as this changes the direction of feed.

- Block feed screws with the aid of a piece of soft metal (copper, aluminium etc.)
- Tighten feed screws (item 6) with clamping nuts
- Screw in stud bolts (item 9) (do not insert completely)
- Mount pump casing (item 2). When the main direction of rotation is rightward, the "VS" stamped on the face must point down towards the cover (clockwise when looking towards the end of the drive shaft)
- Mount pump casing (item 2)
- Insert casing shaped ring (item 103) in cover
- Mount cover (item 1)
- Screw on and tighten capped nuts (item 100) with washers (item 101)

5 Removing the bearing support

- Remove product-contact parts
- Drain gear oil using the oil drain screw (item 19)
- Unscrew socket head bolts (item 122)
- Remove gear hood (item 5), flat gasket (item 128) and shaft seal (item 117)
- Block gearwheels (items 11 and 13) with the aid of a piece of soft metal (copper, aluminium etc.)



- Undo hexagonal bolts (item 12) and remove together with washers (item 111)
- Undo hexagonal bolt (item 115)
- Remove gearwheels (items 11 and 13) together with spring washer (item 114) and clamping sleeve (item 10)
- Remove bearing covers (items 14 and 15) with Nilos ring (item 121)
- Remove spacer sleeves (item 16)
- Pull shafts (items 7 and 8) out of the bearing casing
- Remove front securing V ring (item 125)
- Move spacer sleeve (item 17)
- Remove angular contact ball bearings (item 107) with the aid of an extractor
- Remove spacer sleeves (item 17)
- Remove rear securing V ring (item 125)
- Remove needle bearings (item 123) and bearing internal ring (item 124)
- Remove shaft seal rings (item 106)

6 Assembling bearing support

- Mount one securing V ring (item 125) on each shaft (items 7 and 8)
- Warm bearings before assembly to 195°F with the aid of a suitable device

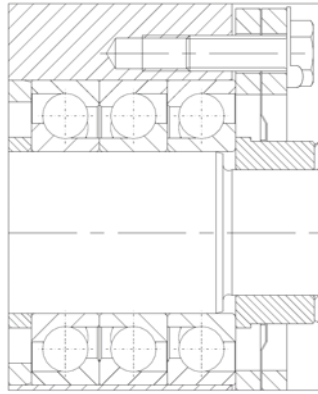
Important: The bearing temperature must NOT exceed 250°F, even partially!

- Pull bearing inner ring (item 124) and needle bearings (item 123) onto shafts (items 7 and 8)

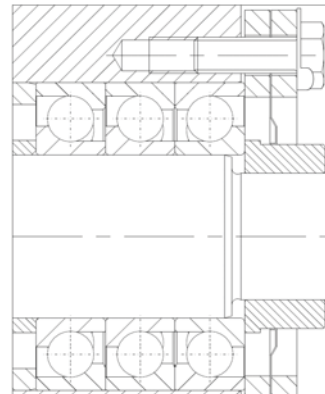
- Mount rear securing V rings (item 125) onto shafts (items 7 and 8)
- Mount spacer sleeves (item 17) with larger diameter on the needle bearings
- Mount angular contact ball bearings (item 107) on the shafts

Important: Make sure the installation position is correct!

Mechanical seal on the discharge side

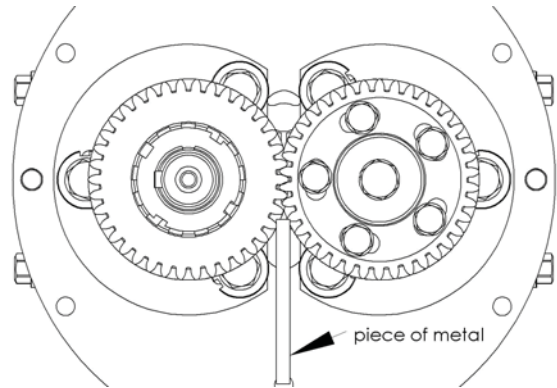
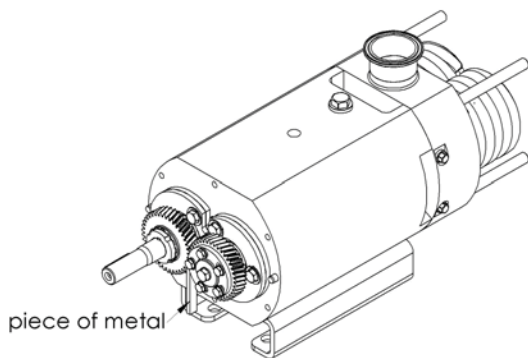


Mechanical seal on the intake side



- Push shafts (items 7 and 8) into the bearing casing. The lubrication holes of the needle bearings should be aligned upwards
- Mount spacer sleeves (item 16)
- Mount bearing cover with groove downward (item 14)
- Mount Nilos ring (item 121) and bearing cover (item 15)
- Mount locking washers (item 109) with hexagonal bolts (item 110)
- Tighten hexagonal bolts (item 110) in accordance with tightening torque table
- Rotate shafts and check that there is no sound of grinding/friction between Nilos rings (item 121) and spacer sleeves (item 16). Adjust if necessary
- Mount gearwheel on drive side (item 13) with locking plate (item 119)
- Mount driven gearwheel (item 11) with clamping sleeve (item 10) and spring washer (item 114)
- Mount hexagonal bolts (item 112) with washers (item 111) and spring washer (113). The hexagonal bolts (item 112) should be centrally positioned in the elongated holes of the gearwheel (item 11)

- Tighten slotted nut (item 118) and hexagonal bolt (item 115), secure with locking plate (item 119)
- Undo hexagonal bolts (item 112) again
- Mount product-contact part of the pump in accordance with instructions "Mounting the feed screws and mechanical seals"
- Set the clearance between the feed screws (item 6) with the aid of the elongated holes in the gearwheel (item 11). If the elongated holes are not sufficient, undo the hexagonal bolt (item 115) and the gearwheel (item 11) in order to move it along by one or more teeth
- Block gearwheels (items 11 and 13) again with the aid of a piece of soft metal (copper, aluminium etc.) and tighten hexagonal bolts (item 112) in accordance with the tightening torque table



- Press shaft seal rings (item 106) into bearing casing (item 4). Use the manufacturer's assembly tools for this
- Press shaft seal ring (item 117) into gear casing
- Mount gear hood (item 5) with flat gasket (item 128)
- Screw in socket head bolts (item 102)
- Press shaft seal ring (item 117) into gear hood (item 5)
- Drive the key (item 116) into the drive shaft
- Screw in oil drain screw (item 19) and fill with gear oil via the locking screw up to the oil level indicator marking
- Finish assembling the product-contact part of the pump in accordance with instructions for "Mounting the feed screws and mechanical seals".

Appendix A

1. Torque tightening table

Designation	Item no.	STSC 50	STS (C) 70	STS (C) 90	STS 125
Clamping nut	18	11 Ft-lbs.	20 Ft-lbs.	82 Ft-lbs. (M16)	148 Ft-lbs. (M24)
Capnut	100	20 Ft-lbs.	37 Ft-lbs.	82 Ft-lbs. (M16)	148 Ft-lbs. (M20)
Hexagonal bolt	110	9 Ft-lbs.	20 Ft-lbs.	40 Ft-lbs. (M10)	40 Ft-lbs. (M10)
Hexagonal bolt	112	6 Ft-lbs.	9 Ft-lbs.	20 Ft-lbs. (M8)	40 Ft-lbs. (M10)
Hexagonal bolt	115	12 Ft-lbs.	12 Ft-lbs.	45 Ft-lbs. (M12)	310 Ft-lbs. (M24)

2. Non-Product Contact Cleaning Procedure

- a. Visually inspect all internal, external threads and enclosed non-product contact cavities.
- b. Clean all threads (internal and external) with a capable soft bristle brush and an approved and suitable cleaner.
- c. Verify all residue has been removed. Reclean as necessary.
- d. Sanitize all surfaces with approved and suitable sanitizer.
- e. Keep all sanitized parts and surfaces protected from contamination prior to reassembly.

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AXIFLOW

TECHNOLOGIES, INC.

1955 Vaughn Road
Kennesaw, GA 30144
www.axiflowtechnologies.com

Pump Model: STSC 90-38 DBL Elastomers: Viton
Pump Serial No.: 16227-001

Position No.	Part No.	Description	Quantity
1	429 20	End Cover - 4" Tri Clamp Connection	1
2	365 56	Pump Casing - Chrome Carbide Coating	1
3	374 86	Intermediate Flange - 3" Tri Clamp Connection	1
4	365 57	Bearing Housing	1
5	439 64	Gear Cover - 25 Hp/1,800 Rpm C-Face - 284TC Frame	1
6	366 90	Feed Screws - 38 Pitch	1
7	370 21	Driven Shaft	1
8	370 21	Drive Shaft	1
9	367 14	Pump Casing Tension Bolts	4
10	367 16	Driven Shaft Gear Bushing	1
11	367 17	Driven Shaft Gear Wheel	1
12	367 18	Spacer Bushing	1
13	391 32	Drive Shaft Gear Wheel	1
14	367 20	Bearing Cover	2
15	367 21	Bearing Cover with Groove	2
16	367 22	Bearing Spacer	2
17	371 24	Bearing Spacer	2
18	365 60	Tension Nut	2
19	365 17	Oil Fill/Drain Plug	2
21	294 57	Plug (Not Used in Double Seal Configuration)	4
22	371 16	Pump Base (Not Used in C-Face Configuration)	1
30	436 41	Gear Housing Cover	1
31	436 43	Gear Housing Cover Gasket	1
32	176 75	Hex Head Bolt	8
33	177 77	Washer	8
100	365 38	Pump Casing Cap Nut	4
101	170 69	Washer	4
102	365 40	Socket Head Cap Screw	6
103	391 75	Pump Casing Form Ring - Viton	2
104	391 67	Complete Double Mechanical Seal - SIC/Carbon/Viton	2
105	365 41	Gamma Ring - (Not Used in Double Seal Configuration)	2
106	365 42	Radial Shaft Seal Ring	2
107	368 42	Tapered Roller Bearing	6
108	177 92	Cylindrical Locating Pin	6
109	231 24	Lock Washer	6
110	369 23	Hex Head Bolt	6
111	235 36	Washer	5
112	348 82	Hex Head Bolt	5

AXIFLOW

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1955 Vaughn Road
Kennesaw, GA 30144
www.axiflowtechnologies.com

Pump Model: STSC 90-38 DBL Elastomers: Viton
Pump Serial No.: 16227-001

Position No.	Part No.	Description	Quantity
113	361 73	Lock Washer	5
114	365 44	Lock Washer	2
115	372 30	Hex Head Bolt	2
116	365 46	Shaft Key (Not Used in C-Face Configuration)	1
117	365 47	Radial Shaft Seal (Not Used in C-Face Configuration)	1
118	365 48	Locking Nut (Not Used in C-Face Configuration)	1
119	365 49	Locking Washer (Not Used in C-Face Configuration)	1
120	365 50	Shaft Key	2
121	365 51	Nilos-Ring	2
122	394 69	Socket Head Cap Screw - 25 Hp/1,800 Rpm-284TC Frame	6
123	365 52	Needle Roller Bearing - Outer Ring	2
124	365 53	Needle Roller Bearing - Inner Ring	2
125	365 54	Locking Snap Ring	4
126	391 71	Tension Nut Form Ring - Viton	2
127	365 55	Tension Nut Stud	2
128	368 09	Gear Cover Gasket	1
129	368 10	Oil Level Sight Glass	1
130	363 34	De-aeration Valve	1
131	157 81	Oil Level Sight Glass Seal Ring	1
132	375 43	O-Ring	3
202	441 48	Motor Adapt. Flange-25 Hp/1,800 Rpm-284TC Frame	1
203	209 58	Hex Head Bolt	4
208	374 52	Pump Foot	1
209	140 62	Pump Foot Hex Nut	1
300	419 58	Pump Coupling Hub-25 Hp/1,800 Rpm-284TC Frame	1
301	403 12	Locating Pin	1
302	216 25	Hex Head Bolt	4
303	231 84	Lock Washer	4
304	441 61	Motor Coupling Hub-25 Hp/1,800 Rpm-284TC Frame	1
305	419 62	Coupling Insert	1



Integral Horsepower AC Induction Motors

Installation & Operating Manual

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Section 1

General Information

- Overview** This manual contains general procedures that apply to Baldor Motor products. Be sure to read and understand the Safety Notice statements in this manual. For your protection, do not install, operate or attempt to perform maintenance procedures until you understand the Warning and Caution statements. A Warning statement indicates a possible unsafe condition that can cause harm to personnel. A Caution statement indicates a condition that can cause damage to equipment.
- Important:** **This instruction manual is not intended to include a comprehensive listing of all details for all procedures required for installation, operation and maintenance. This manual describes general guidelines that apply to most of the motor products shipped by Baldor. If you have a question about a procedure or are uncertain about any detail, Do Not Proceed. Please contact your Baldor distributor for more information or clarification.**
- Before you install, operate or perform maintenance, become familiar with the following:
- NEMA Publication MG-2, Safety Standard for Construction and guide for Selection, Installation and Use of Electric Motors and Generators.
 - The National Electrical Code
 - Local codes and Practices

Limited Warranty

www.baldor.com/support/warranty_standard.asp

- Safety Notice:** This equipment contains high voltage! Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation and maintenance of electrical equipment.
- Be sure that you are completely familiar with NEMA publication MG-2, safety standards for construction and guide for selection, installation and use of electric motors and generators, the National Electrical Code and local codes and practices. Unsafe installation or use can cause conditions that lead to serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.
- WARNING:** **Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.**
- WARNING:** **Disconnect all electrical power from the motor windings and accessory devices before disassembly of the motor. Electrical shock can cause serious or fatal injury.**
- WARNING:** **Be sure the system is properly grounded before applying power. Do not apply AC power before you ensure that all grounding instructions have been followed. Electrical shock can cause serious or fatal injury. National Electrical Code and Local codes must be carefully followed.**
- WARNING:** **Avoid extended exposure to machinery with high noise levels. Be sure to wear ear protective devices to reduce harmful effects to your hearing.**
- WARNING:** **Surface temperatures of motor enclosures may reach temperatures which can cause discomfort or injury to personnel accidentally coming into contact with hot surfaces. When installing, protection should be provided by the user to protect against accidental contact with hot surfaces. Failure to observe this precaution could result in bodily injury.**
- WARNING:** **This equipment may be connected to other machinery that has rotating parts or parts that are driven by this equipment. Improper use can cause serious or fatal injury. Only qualified personnel should attempt to install operate or maintain this equipment.**
- WARNING:** **Do not by-pass or disable protective devices or safety guards. Safety features are designed to prevent damage to personnel or equipment. These devices can only provide protection if they remain operative.**
- WARNING:** **Avoid the use of automatic reset devices if the automatic restarting of equipment can be hazardous to personnel or equipment.**
- WARNING:** **Be sure the load is properly coupled to the motor shaft before applying power. The shaft key must be fully captive by the load device. Improper coupling can cause harm to personnel or equipment if the load decouples from the shaft during operation.**
- WARNING:** **Use proper care and procedures that are safe during handling, lifting, installing, operating and maintaining operations. Improper methods may cause muscle strain or other harm.**
- WARNING:** **Thermostat contacts automatically reset when the motor has slightly cooled down. To prevent injury or damage, the control circuit should be designed so that automatic starting of the motor is not possible when the thermostat resets.**

Safety Notice Continued

- WARNING:** UL Listed motors must only be serviced by UL Approved Authorized Baldor Service Centers if these motors are to be returned to a hazardous and/or explosive atmosphere.
- WARNING:** Pacemaker danger – Magnetic and electromagnetic fields in the vicinity of current carrying carrying conductors and permanent magnet motors can result result in a serious health hazard to persons with cardiac pacemakers, metal implants, and hearing aids. To avoid risk, stay way from the area surrounding a permanent magnet motor.
- WARNING:** Before performing any motor maintenance procedure, be sure that the equipment connected to the motor shaft cannot cause shaft rotation. If the load can cause shaft rotation, disconnect the load from the motor shaft before maintenance is performed. Unexpected mechanical rotation of the motor parts can cause injury or motor damage.
- WARNING:** Use only UL/CSA listed explosion proof motors in the presence of flammable or combustible vapors or dust.
- WARNING:** Motors that are to be used in flammable and/or explosive atmospheres must display the UL label on the nameplate along with CSA listed logo. Specific service conditions for these motors are defined in NFPA 70 (NEC) Article 500.
- WARNING:** Guards must be installed for rotating parts such as couplings, pulleys, external fans, and unused shaft extensions, should be permanently guarded to prevent accidental contact by personnel. Accidental contact with body parts or clothing can cause serious or fatal injury.
- Caution:** To prevent premature equipment failure or damage, only qualified maintenance personnel should perform maintenance.
- Caution:** Do not over-lubricate motor as this may cause premature bearing failure.
- Caution:** Do not over tension belts. Excess tension may damage the motor or driven equipment.
- Caution:** Do not lift the motor and its driven load by the motor lifting hardware. The motor lifting hardware is adequate for lifting only the motor. Disconnect the load (gears, pumps, compressors, or other driven equipment) from the motor shaft before lifting the motor.
- Caution:** If eye bolts are used for lifting a motor, be sure they are securely tightened. The lifting direction should not exceed a 20° angle from the shank of the eye bolt or lifting lug. Excessive lifting angles can cause damage.
- Caution:** To prevent equipment damage, be sure that the electrical service is not capable of delivering more than the maximum motor rated amps listed on the rating plate.
- Caution:** If a HI POT test (High Potential Insulation test) must be performed, follow the precautions and procedure in NEMA MG1 and MG2 standards to avoid equipment damage.

If you have any questions or are uncertain about any statement or procedure, or if you require additional information please contact your Baldor distributor or an Authorized Baldor Service Center.

Receiving Each Baldor Electric Motor is thoroughly tested at the factory and carefully packaged for shipment. When you receive your motor, there are several things you should do immediately.

1. Observe the condition of the shipping container and report any damage immediately to the commercial carrier that delivered your motor.
2. Verify that the part number of the motor you received is the same as the part number listed on your purchase order.

Handling The motor should be lifted using the lifting lugs or eye bolts provided.

Caution: Do not lift the motor and its driven load by the motor lifting hardware. The motor lifting hardware is adequate for lifting only the motor. Disconnect the load (gears, pumps, compressors, or other driven equipment) from the motor shaft before lifting the motor.

1. Use the lugs or eye bolts provided to lift the motor. Never attempt to lift the motor and additional equipment connected to the motor by this method. The lugs or eye bolts provided are designed to lift only the motor. Never lift the motor by the motor shaft or the hood of a WP11 motor.
2. To avoid condensation inside the motor, do not unpack until the motor has reached room temperature. (Room temperature is the temperature of the room in which it will be installed). The packing provides insulation from temperature changes during transportation.
3. When lifting a WP11 (Weather Proof Type 2) motor, do not lift the motor by inserting lifting lugs into holes on top of the cooling hood. These lugs are to be used for hood removal only. A spreader bar should be used to lift the motor by the cast lifting lugs located on the motor frame.

-
4. If the motor must be mounted to a plate with the driven equipment such as pump, compressor etc., it may not be possible to lift the motor alone. For this case, the assembly should be lifted by a sling around the mounting base. The entire assembly can be lifted as an assembly for installation.
Do not lift the assembly using the motor lugs or eye bolts provided. Lugs or eye bolts are designed to lift motor only. If the load is unbalanced (as with couplings or additional attachments) additional slings or other means must be used to prevent tipping. In any event, the load must be secure before lifting. If the load is unbalanced (as with couplings or additional attachments) additional slings or other means must be used to prevent tipping. In any event, the load must be secure before lifting.

Storage

Storage requirements for motors and generators that will not be placed in service for at least six months from date of shipment.

Improper motor storage will result in seriously reduced reliability and failure. An electric motor that does not experience regular usage while being exposed to normally humid atmospheric conditions is likely to develop rust in the bearings or rust particles from surrounding surfaces may contaminate the bearings. The electrical insulation may absorb an excessive amount of moisture leading to the motor winding failure.

A wooden crate "shell" should be constructed to secure the motor during storage. This is similar to an export box but the sides & top must be secured to the wooden base with lag bolts (not nailed as export boxes are) to allow opening and reclosing many times without damage to the "shell".

Minimum resistance of motor winding insulation is 5 Meg ohms or the calculated minimum, which ever is greater. Minimum resistance is calculated as follows: **$R_m = kV + 1$**

where: (Rm is minimum resistance to ground in Meg-Ohms and
kV is rated nameplate voltage defined as Kilo-Volts.)

Example: For a 480VAC rated motor $R_m = 1.48$ meg-ohms (use 5 MΩ).

For a 4160VAC rated motor $R_m = 5.16$ meg-ohms.

Preparation for Storage

1. Some motors have a shipping brace attached to the shaft to prevent damage during transportation. The shipping brace, if provided, must be removed and stored for future use. The brace must be reinstalled to hold the shaft firmly in place against the bearing before the motor is moved.
2. Store in a clean, dry, protected warehouse where control is maintained as follows:
 - a. Shock or vibration must not exceed 2 mils maximum at 60 hertz, to prevent the bearings from brinelling. If shock or vibration exceeds this limit vibration isolation pads must be used.
 - b. Storage temperatures of 10°C (50°F) to 49°C (120°F) must be maintained.
 - c. Relative humidity must not exceed 60%.
 - d. Motor space heaters (when present) are to be connected and energized whenever there is a possibility that the storage ambient conditions will reach the dew point. Space heaters are optional.
Note: Remove motor from containers when heaters are energized, reprotect if necessary.
3. Measure and record the resistance of the winding insulation (dielectric withstand) every 30 days of storage.
 - a. If motor insulation resistance decreases below the minimum resistance, contact your Baldor District office.
 - b. Place new desiccant inside the vapor bag and re-seal by taping it closed.
 - c. If a zipper-closing type bag is used instead of the heat-sealed type bag, zip the bag closed instead of taping it. Be sure to place new desiccant inside bag after each monthly inspection.
 - d. Place the shell over the motor and secure with lag bolts.
4. Where motors are mounted to machinery, the mounting must be such that the drains and breathers are fully operable and are at the lowest point of the motor. Vertical motors must be stored in the vertical position. Storage environment must be maintained as stated in step 2.

-
5. Motors with anti-friction bearings are to be greased at the time of going into extended storage with periodic service as follows:
 - a. Motors marked "Do Not Lubricate" on the nameplate do not need to be greased before or during storage.
 - b. Ball and roller bearing (anti-friction) motor shafts are to be rotated manually every 3 months and greased every 6 months in accordance with the Maintenance section of this manual.
 - c. Sleeve bearing (oil lube) motors are drained of oil prior to shipment. The oil reservoirs must be refilled to the indicated level with the specified lubricant, (see Maintenance). The shaft should be rotated monthly by hand at least 10 to 15 revolutions to distribute oil to bearing surfaces.
 - d. "Provisions for oil mist lubrication" – These motors are packed with grease. Storage procedures are the same as paragraph 5b.
 - e. "Oil Mist Lubricated" – These bearings are protected for temporary storage by a corrosion inhibitor. If stored for greater than 3 months or outdoor storage is anticipated, connected to the oil mist system while in storage. If this is not possible, add the amount of grease indicated under "Standard Condition" in Section 3, then rotate the shaft 15 times by hand.
 6. All breather drains are to be fully operable while in storage (drain plugs removed). The motors must be stored so that the drain is at the lowest point. All breathers and automatic "T" drains must be operable to allow breathing and draining at points other than through the bearings around the shaft. Vertical motors should be stored in a safe stable vertical position.
 7. Coat all external machined surfaces with a rust preventing material.
An acceptable product for this purpose is Exxon Rust Ban # 392.

Non-Regreaseable Motors

Non-regreaseable motors with "Do Not Lubricate" on the nameplate should have the motor shaft rotated 15 times to redistribute the grease within the bearing every 3 months or more often.

All Other Motor Types

Before storage, the following procedure must be performed.

1. Remove the grease drain plug, if supplied, (opposite the grease fitting) on the bottom of each bracket prior to lubricating the motor.
2. The motor with regreaseable bearing must be greased as instructed in Section 3 of this manual.
3. Replace the grease drain plug after greasing.
4. The motor shaft must be rotated a minimum of 15 times after greasing.
5. Motor Shafts are to be rotated at least 15 revolutions manually every 3 months and additional grease added every nine months (see Section 3) to each bearing.
6. Bearings are to be greased at the time of removal from storage.

Removal From Storage

1. Remove all packing material.
2. Measure and record the electrical resistance of the winding insulation resistance meter at the time of removal from storage. The insulation resistance must not be less than 50% from the initial reading recorded when the motor was placed into storage. A decrease in resistance indicates moisture in the windings and necessitates electrical or mechanical drying before the motor can be placed into service. If resistance is low, contact your Baldor District office.
3. Regrease the bearings as instructed in Section 3 of this manual.
4. Reinstall the original shipping brace if motor is to be moved. This will hold the shaft firmly against the bearing and prevent damage during movement.

Section 2

Installation & Operation

Overview

Installation should conform to the National Electrical Code as well as local codes and practices. When other devices are coupled to the motor shaft, be sure to install protective devices to prevent future accidents. Some protective devices include, coupling, belt guard, chain guard, shaft covers etc. These protect against accidental contact with moving parts. Machinery that is accessible to personnel should provide further protection in the form of guard rails, screening, warning signs etc.

Location

It is important that motors be installed in locations that are compatible with motor enclosure and ambient conditions. Improper selection of the motor enclosure and ambient conditions can lead to reduced operating life of the motor.

Proper ventilation for the motor must be provided. Obstructed airflow can lead to reduction of motor life.

1. **Open Drip-Proof/WPI** motors are intended for use indoors where atmosphere is relatively clean, dry, well ventilated and non-corrosive.
2. **Totally Enclosed and WPII** motors may be installed where dirt, moisture or dust are present and in outdoor locations.

Severe Duty, IEEE 841 and Washdown Duty enclosed motors are designed for installations with high corrosion or excessive moisture conditions. These motors should not be placed into an environment where there is the presence of flammable or combustible vapors, dust or any combustible material, unless specifically designed for this type of service.

Hazardous Locations are those where there is a risk of ignition or explosion due to the presence of combustible gases, vapors, dust, fibers, or flyings. Facilities requiring special equipment for hazardous locations are typically classified in accordance with local requirements. In the US market, guidance is provided by the National Electric Code.

Caution:

Do not lift the motor and its driven load by the motor lifting hardware. The motor lifting hardware is adequate for lifting only the motor. Disconnect the load (gears, pumps, compressors, or other driven equipment) from the motor shaft before lifting the motor.

Mounting

The motor must be securely installed to a rigid foundation or mounting surface to minimize vibration and maintain alignment between the motor and shaft load. Failure to provide a proper mounting surface may cause vibration, misalignment and bearing damage.

Foundation caps and sole plates are designed to act as spacers for the equipment they support. If these devices are used, be sure that they are evenly supported by the foundation or mounting surface.

After installation is complete and accurate alignment of the motor and load is accomplished, the base should be grouted to the foundation to maintain this alignment.

The standard motor base is designed for horizontal or vertical mounting. Adjustable or sliding rails are designed for horizontal mounting only. Consult your Baldor distributor or authorized Baldor Service Center for further information.

Alignment

Accurate alignment of the motor with the driven equipment is extremely important. The pulley, sprocket, or gear used in the drive should be located on the shaft as close to the shaft shoulder as possible.

It is recommended to heat the pulley, sprocket, or gear before installing on the motor shaft.

Forcibly driving a unit on the motor shaft will damage the bearings.

1. **Direct Coupling**

For direct drive, use flexible couplings if possible. Consult the drive or equipment manufacturer for more information. Mechanical vibration and roughness during operation may indicate poor alignment. Use dial indicators to check alignment. The space between coupling hubs should be maintained as recommended by the coupling manufacturer.

2. **End-Play Adjustment**

The axial position of the motor frame with respect to its load is also extremely important. The motor bearings are not designed for excessive external axial thrust loads. Improper adjustment will cause failure.

3. **Pulley Ratio**

The pulley ratio should not exceed 8:1.

Caution:

Do not over tension belts. Excess tension may damage the motor or driven equipment.

4. **Belt Drive**

Align sheaves carefully to minimize belt wear and axial bearing loads (see End-Play Adjustment). Belt tension should be sufficient to prevent belt slippage at rated speed and load. However, belt slippage may occur during starting.

5. Sleeve bearing motors are only suitable for coupled loads.

- Doweling & Bolting**

After proper alignment is verified, dowel pins should be inserted through the motor feet into the foundation. This will maintain the correct motor position should motor removal be required. (Baldor motors are designed for doweling.)

1. Drill dowel holes in diagonally opposite motor feet in the locations provided.

2. Drill corresponding holes in the foundation.

3. Ream all holes.

4. Install proper fitting dowels.

5. Mounting bolts must be carefully tightened to prevent changes in alignment. Use a flat washer and lock washer under each nut or bolt head to hold the motor feet secure. Flanged nuts or bolts may be used as an alternative to washers.
- WARNING:**

Guards must be installed for rotating parts such as couplings, pulleys, external fans, and unused shaft extensions, should be permanently guarded to prevent accidental contact by personnel. Accidental contact with body parts or clothing can cause serious or fatal injury.
- Guarding**

Guards must be installed for rotating parts such as couplings, pulleys, external fans, and unused shaft extensions. This is particularly important where the parts have surface irregularities such as keys, key ways or set screws. Some satisfactory methods of guarding are:

1. Covering the machine and associated rotating parts with structural or decorative parts of the driven equipment.

2. Providing covers for the rotating parts. Covers should be sufficiently rigid to maintain adequate guarding during normal service.
- Power Connection**

Motor and control wiring, overload protection, disconnects, accessories and grounding should conform to the National Electrical Code and local codes and practices. Flying leads must be insulated with two full wraps of electrical grade insulating tape or heat shrink tubing.
- Conduit Box**

For ease of making connections, an oversize conduit box is provided.
The box can be rotated 360° in 90° increments.
Auxiliary conduit boxes are provided on some motors for accessories such as space heaters, RTD's etc.
- AC Power**

Connect the motor leads as shown on the connection diagram located on the name plate or inside the cover on the conduit box. Be sure the following guidelines are met:

1. AC power is within ±10% of rated voltage with rated frequency. (See motor name plate for ratings).

OR

2. AC power is within ±5% of rated frequency with rated voltage.

OR

3. A combined variation in voltage and frequency of ±10% (sum of absolute values) of rated values, provided the frequency variation does not exceed ±5% of rated frequency.

Performance within these voltage and frequency variations are shown in Figure 2-2.

Figure 2-1 Accessory Connections








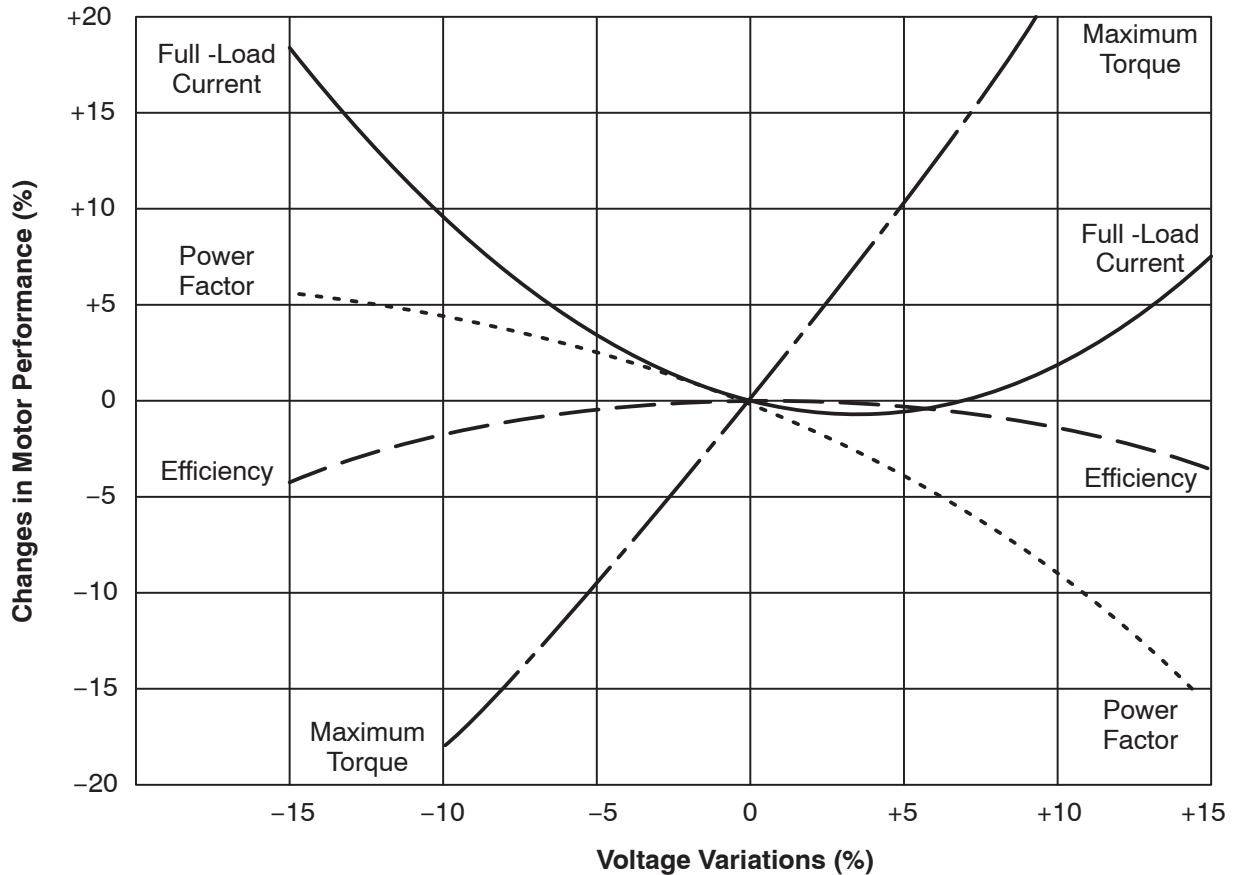
<div><div>HEATERS</div><div><div>H1</div><div></div><div>H2</div></div><div>H1</div><div></div><div>H2</div></div>	<div>One heater is installed in each end of motor.</div> <div>Leads for each heater are labeled H1 & H2.</div> <div>(Like numbers should be tied together).</div>
<div><div>THERMISTORS</div><div><div>T1</div><div></div><div></div><div></div><div>T2</div></div></div>	<div>Three thermistors are installed in windings and tied in series.</div> <div>Leads are labeled T1 & T2.</div>
<div><div>WINDING RTDS</div><div><div>RED</div><div></div><div>RED</div><div>WHITE</div></div></div>	<div>Winding RTDs are installed in windings (2) per phase.</div> <div>Each set of leads is labeled W1, W2, W3, W4, W5, & W6.</div>
<div><div>BEARING RTD</div><div><div>RED</div><div></div><div>RED</div><div>WHITE</div></div></div>	<div>* One bearing RTD is installed in Drive endplate (PUEP), leads are labeled RTDDE.</div> <div>* One bearing RTD is installed in Opposite Drive endplate (FREP), leads are labeled RTDODE.</div> <div>* Note RTD may have 2–Red/1–White leads; or 2–White/1–Red Lead.</div>

Figure 2-2 Typical Motor Performance VS Voltage Variations



Rotation All three phase motors are reversible. To reverse the direction of rotation, disconnect and lock out power and interchange any two of the three line leads for three phase motors. For single phase motors, check the connection diagram to determine if the motor is reversible and follow the connection instructions for lead numbers to be interchanged. Not all single phase motors are reversible.

Adjustable Frequency Power Inverters used to supply adjustable frequency power to induction motors produce wave forms with lower order harmonics with voltage spikes superimposed. Turn-to-turn, phase-to-phase, and ground insulation of stator windings are subject to the resulting dielectric stresses. Suitable precautions should be taken in the design of these drive systems to minimize the magnitude of these voltage spikes. Consult the drive instructions for maximum acceptable motor lead lengths, and proper grounding.

First Time Start Up Be sure that all power to motor and accessories is off. Be sure the motor shaft is disconnected from the load and will not cause mechanical rotation of the motor shaft.

1. Make sure that the mechanical installation is secure. All bolts and nuts are tightened etc.
2. If motor has been in storage or idle for some time, check winding insulation integrity.
3. Inspect all electrical connections for proper termination, clearance, mechanical strength and electrical continuity.
4. Be sure all shipping materials and braces (if used) are removed from motor shaft.
5. Manually rotate the motor shaft to ensure that it rotates freely.
6. Replace all panels and covers that were removed during installation.
7. Momentarily apply power and check the direction of rotation of the motor shaft.
8. If motor rotation is wrong, be sure power is off and change the motor lead connections. Verify rotation direction before you continue.
9. Start the motor and ensure operation is smooth without excessive vibration or noise. If so, run the motor for 1 hour with no load connected.
10. After 1 hour of operation, disconnect power and connect the load to the motor shaft. Verify all coupling guards and protective devices are installed. Ensure motor is properly ventilated.

Coupled Start Up This procedure assumes a coupled start up. Also, that the first time start up procedure was successful.

1. Check the coupling and ensure that all guards and protective devices are installed.
2. Check that the coupling is properly aligned and not binding.
3. The first coupled start up should be with no load. Apply power and verify that the load is not transmitting excessive vibration back to the motor through the coupling or the foundation. Vibration should be at an acceptable level.
4. Run for approximately 1 hour with the driven equipment in an unloaded condition.

The equipment can now be loaded and operated within specified limits. Do not exceed the name plate ratings for amperes for steady continuous loads.

Jogging and Repeated Starts Repeated starts and/or jogs of induction motors generally reduce the life of the motor winding insulation. A much greater amount of heat is produced by each acceleration or jog than by the same motor under full load. If it is necessary to repeatedly start or jog the motor, it is advisable to check the application with your local Baldor distributor or Baldor Service Center.

Heating - Duty rating and maximum ambient temperature are stated on the motor name plate. Do not exceed these values. If there is any question regarding safe operation, contact your local Baldor District Office or Baldor Service Center.

Section 3

Maintenance & Troubleshooting

WARNING: UL Listed motors must only be serviced by UL Approved Authorized Baldor Service Centers if these motors are to be returned to a hazardous and/or explosive atmosphere.

General Inspection Inspect the motor at regular intervals, approximately every 500 hours of operation or every 3 months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection:

WARNING: Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt the installation, operation and maintenance of this equipment.

1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure.
2. Use a "Megger" periodically to ensure that the integrity of the winding insulation has been maintained. Record the Megger readings. Immediately investigate any significant drop in insulation resistance.
3. Check all electrical connectors to be sure that they are tight.

Relubrication & Bearings Bearing grease will lose its lubricating ability over time, not suddenly. The lubricating ability of a grease (over time) depends primarily on the type of grease, the size of the bearing, the speed at which the bearing operates and the severity of the operating conditions. Good results can be obtained if the following recommendations are used in your maintenance program.

Type of Grease A high grade ball or roller bearing grease should be used. Recommended grease for standard service conditions is **Polyrex EM (Mobil)**. Do not mix greases unless compatibility has been checked and verified.

Equivalent and compatible greases include:

Texaco Polystar, Rykon Premium #2, Pennzoil Pen 2 Lube and Chevron SRI.

Relubrication Intervals Recommended relubrication intervals are shown in Table 3-1. It is important to realize that the recommended intervals of Table 3-1 are based on average use.

Refer to additional information contained in Tables 3-2, 3-3 and 3-4.

Table 3-1 Relubrication Intervals *

NEMA / (IEC) Frame Size	Rated Speed - RPM					
	10000	6000	3600	1800	1200	900
Up to 210 incl. (132)	**	2700 Hrs.	5500 Hrs.	12000 Hrs.	18000 Hrs.	22000 Hrs.
Over 210 to 280 incl. (180)		**	3600 Hrs.	9500 Hrs.	15000 Hrs.	18000 Hrs.
Over 280 to 360 incl. (225)		**	* 2200 Hrs.	7400 Hrs.	12000 Hrs.	15000 Hrs.
Over 360 to 5800 incl. (300)		**	*2200 Hrs.	3500 Hrs.	7400 Hrs.	10500 Hrs.

* Relubrication intervals are for ball bearings.

For vertically mounted motors and roller bearings, divide the relubrication interval by 2.

** For motors operating at speeds greater than 3600 RPM, contact Baldor for relubrication recommendations.

Table 3-2 Service Conditions

Severity of Service	Hours per day of Operation	Ambient Temperature Maximum	Atmospheric Contamination
Standard	8	40° C	Clean, Little Corrosion
Severe	16 Plus	50° C	Moderate dirt, Corrosion
Extreme	16 Plus	>50° C* or Class H Insulation	Severe dirt, Abrasive dust, Corrosion, Heavy Shock or Vibration
Low Temperature		<-29° C **	

* Special high temperature grease is recommended (Dow Corning DC44). Note that Dow Corning DC44 grease does not mix with other grease types. Thoroughly clean bearing & cavity before adding grease.

** Special low temperature grease is recommended (Aeroshell 7).

Table 3-3 Relubrication Interval Multiplier

Severity of Service	Multiplier
Standard	1.0
Severe	0.5
Extreme	0.1
Low Temperature	1.0

Some motor designs use different bearings on each motor end. This is normally indicated on the motor nameplate. In this case, the larger bearing is installed on the motor Drive endplate. For best relubrication results, only use the appropriate amount of grease for each bearing size (not the same for both).

Table 3-4 Bearings Sizes and Types

Frame Size NEMA (IEC)	Bearing Description (These are the “Large” bearings (Shaft End) in each frame size)			
	Bearing	Weight of Grease to add * oz (Grams)	Volume of grease to be added	
			in ³	teaspoon
56 to 140 (90)	6203	0.08 (2.4)	0.15	0.5
140 (90)	6205	0.15 (3.9)	0.2	0.8
180 (100–112)	6206	0.19 (5.0)	0.3	1.0
210 (132)	6307	0.30 (8.4)	0.6	2.0
250 (160)	6309	0.47 (12.5)	0.7	2.5
280 (180)	6311	0.61 (17)	1.2	3.9
320 (200)	6312	0.76 (20.1)	1.2	4.0
360 (225)	6313	0.81 (23)	1.5	5.2
400 (250)	6316	1.25 (33)	2.0	6.6
440 (280)	6319	2.12 (60)	4.1	13.4
5000 to 5800 (315–450)	6328	4.70 (130)	9.2	30.0
5000 to 5800 (315–450)	NU328	4.70 (130)	9.2	30.0
360 to 449 (225–280)	NU319	2.12 (60)	4.1	13.4
AC Induction Servo				
76 Frame 180 (112)	6207	0.22 (6.1)	0.44	1.4
77 Frame 210 (132)	6210	0.32 (9.0)	0.64	2.1
80 Frame 250(160)	6213	0.49 (14.0)	0.99	3.3

* Weight in grams = .005 DB of grease to be added

Note: Not all bearing sizes are listed. For intermediate bearing sizes, use the grease volume for the next larger size bearing.

Caution: To avoid damage to motor bearings, grease must be kept free of dirt. For an extremely dirty environment, contact your Baldor distributor or an authorized Baldor Service Center for additional information.

Relubrication Procedure Be sure that the grease you are adding to the motor is compatible with the grease already in the motor. Consult your Baldor distributor or an authorized service center if a grease other than the recommended type is to be used.

Caution: Do not over-lubricate motor as this may cause premature bearing failure.

With Grease Outlet Plug

1. With the motor stopped, clean all grease fittings with a clean cloth.
2. Remove grease outlet plug.

Caution: Over-lubricating can cause excessive bearing temperatures, premature lubrication breakdown and bearing failure.

3. Add the recommended amount of grease.
4. Operate the motor for 15 minutes with grease plug removed.
This allows excess grease to purge.
5. Re-install grease outlet plug.

Without Grease Provisions

Note: Only a Baldor authorized and UL or CSA certified service center can disassemble a UL/CSA listed explosion proof motor to maintain it's UL/CSA listing.

1. Disassemble the motor.
2. Add recommended amount of grease to bearing and bearing cavity. (Bearing should be about 1/3 full of grease and outboard bearing cavity should be about 1/2 full of grease.)
3. Assemble the motor.

Sample Relubrication Determination

Assume - NEMA 286T (IEC 180), 1750 RPM motor driving an exhaust fan in an ambient temperature of 43° C and the atmosphere is moderately corrosive.

1. Table 3-1 list 9500 hours for standard conditions.
2. Table 3-2 classifies severity of service as "Severe".
3. Table 3-4 shows that 1.2 in³ or 3.9 teaspoon of grease is to be added.

Note: Smaller bearings in size category may require reduced amounts of grease.

Table 3-5 Troubleshooting Chart

Symptom	Possible Causes	Possible Solutions
Motor will not start	Usually caused by line trouble, such as, single phasing at the starter.	Check source of power. Check overloads, fuses, controls, etc.
Excessive humming	High Voltage.	Check input line connections.
	Eccentric air gap.	Have motor serviced at local Baldor service center.
Motor Over Heating	Overload. Compare actual amps (measured) with nameplate rating.	Locate and remove source of excessive friction in motor or load. Reduce load or replace with motor of greater capacity.
	Single Phasing.	Check current at all phases (should be approximately equal) to isolate and correct the problem.
	Improper ventilation.	Check external cooling fan to be sure air is moving properly across cooling fins. Excessive dirt build-up on motor. Clean motor.
	Unbalanced voltage.	Check voltage at all phases (should be approximately equal) to isolate and correct the problem.
	Rotor rubbing on stator.	Check air gap clearance and bearings.
		Tighten "Thru Bolts".
	Over voltage or under voltage.	Check input voltage at each phase to motor.
	Open stator winding.	Check stator resistance at all three phases for balance.
	Grounded winding.	Perform dielectric test and repair as required.
	Improper connections.	Inspect all electrical connections for proper termination, clearance, mechanical strength and electrical continuity. Refer to motor lead connection diagram.
Bearing Over Heating	Misalignment.	Check and align motor and driven equipment.
	Excessive belt tension.	Reduce belt tension to proper point for load.
	Excessive end thrust.	Reduce the end thrust from driven machine.
	Excessive grease in bearing.	Remove grease until cavity is approximately $\frac{3}{4}$ filled.
	Insufficient grease in bearing.	Add grease until cavity is approximately $\frac{3}{4}$ filled.
	Dirt in bearing.	Clean bearing cavity and bearing. Repack with correct grease until cavity is approximately $\frac{3}{4}$ filled.
Vibration	Misalignment.	Check and align motor and driven equipment.
	Rubbing between rotating parts and stationary parts.	Isolate and eliminate cause of rubbing.
	Rotor out of balance.	Have rotor balance checked and repaired at your Baldor Service Center.
	Resonance.	Tune system or contact your Baldor Service Center for assistance.
Noise	Foreign material in air gap or ventilation openings.	Remove rotor and foreign material. Reinstall rotor. Check insulation integrity. Clean ventilation openings.
Growling or whining	Bad bearing.	Replace bearing. Clean all grease from cavity and new bearing. Repack with correct grease until cavity is approximately $\frac{3}{4}$ filled.

Suggested bearing and winding RTD setting guidelines

Most large frame AC Baldor motors with a 1.15 service factor are designed to operate below a Class B (80°C) temperature rise at rated load and are built with a Class H winding insulation system. Based on this low temperature rise, RTD (Resistance Temperature Detectors) settings for Class B rise should be used as a starting point. Some motors with 1.0 service factor have Class F temperature rise.

The following tables show the suggested alarm and trip settings for RTDs. Proper bearing and winding RTD alarm and trip settings should be selected based on these tables unless otherwise specified for specific applications.

If the driven load is found to operate well below the initial temperature settings under normal conditions, the alarm and trip settings may be reduced so that an abnormal machine load will be identified.

The temperature limits are based on the installation of the winding RTDs imbedded in the winding as specified by NEMA. Bearing RTDs should be installed so they are in contact with the outer race on ball or roller bearings or in direct contact with the sleeve bearing shell.

Winding RTDs – Temperature Limit In °C (40°C Maximum Ambient)

Motor Load	Class B Temp Rise ≤ 80°C (Typical Design)		Class F Temp Rise ≤ 105°C		Class H Temp Rise ≤ 125°C	
	Alarm	Trip	Alarm	Trip	Alarm	Trip
≤ Rated Load	130	140	155	165	175	185
Rated Load to 1.15 S.F.	140	150	160	165	180	185

Note: • Winding RTDs are factory production installed, not from Mod-Express.

• When Class H temperatures are used, consider bearing temperatures and relubrication requirements.

Bearing RTDs – Temperature Limit In °C (40°C Maximum Ambient)

Bearing Type Oil or Grease	Anti-Friction		Sleeve	
	Alarm	Trip	Alarm	Trip
Standard*	95	100	85	95
High Temperature**	110	115	105	110

Note: * Bearing temperature limits are for standard design motors operating at Class B temperature rise.

** High temperature lubricants include some special synthetic oils and greases.

Greases that may be substituted that are compatible with Polyrex EM (but considered as “standard” lubricants) include the following:

- | | | |
|--------------------|---------------------------|-----------------------------|
| – Texaco Polystar | – Rykon Premium #2 | – Chevron SRI #2 |
| – Mobilith SHC-100 | – Pennzoil Pennzlube EM-2 | – Chevron Black Pearl |
| – Darmex 707 | – Darmex 711 | – Petro-Canada Peerless LLG |

See the motor nameplate for replacement grease or oil recommendation.

Contact Baldor application engineering for special lubricants or further clarifications.

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Product Information Packet

CECP4103T

25HP, 1770RPM, 3PH, 60HZ, 286TC, 1046M, TEFC, F

Part Detail									
Revision:	V	Status:	PRD/A	Change #:		Proprietary:	No		
Type:	AC	Prod. Type:	1046M	Elec. Spec:	10WGX209	CD Diagram:			
Enclosure:	TEFC	Mfg Plant:		Mech. Spec:	10G297	Layout:			
Frame:	286TC	Mounting:	F1	Poles:	04	Created Date:			
Base:	RG	Rotation:	R	Insulation:	F	Eff. Date:	08-08-2012		
Leads:	9#10	Literature:		Elec. Diagram:		Replaced By:			
Nameplate NP1260E									
CAT.NO.	CECP4103T								
SPEC.	10G297X209G1								
HP	25								
VOLTS	230/460								
AMP	60/30								
RPM	1770								
FRAME	286TC			HZ	60	PH	3		
SER.F.	1.15			CODE	G	DES	B	CL	F
NEMA-NOM-EFF	93.6			PF	84				
RATING	40C AMB-CONT								
CC	010A			USABLE AT 208V			63.3		
DE	6311			ODE			6311		
ENCL	TEFC			SN					

Parts List		
Part Number	Description	Quantity
SA150174	SA 10G297X209G1	1.000 EA
RA139067	RA 10G297X209G1	1.000 EA
09FN3001C02	EXTERNAL FAN, PLASTIC	1.000 EA
S/P107-000-004	SUPER-E(284 FR. & UP)-CL PLANT,POLYREX E	1.000 EA
10CB1000A09P	CONDUIT BOX, MACH W/EPOXY PRIMER	1.000 EA
09GS1010	GASKET, DWG, LEADWIRE SEPERATOR	1.000 EA
10XN3118K16	5/16-18 X 1" GRADE #5, STL, ZINC PLATE	4.000 EA
HW1001A31	LOCKWASHER 5/16, ZINC PLT .591 OD, .319 I	4.000 EA
WD1000B16	KPA-4C BURNDY TERMINAL	1.000 EA
10XN2520K06	1/4-20 X 3/8" HX HD SCREWGRADE 5, ZINC P	1.000 EA
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	1.000 EA
10XN3816K28	3/8-16 X 1.75 HEX HD CAP SCREW, GRADE 5	4.000 EA
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 EA
HA1005A04SP	SLINGER, OD 3.620, ID 1.98,	1.000 EA
HW1001A38	LOCKWASHER 3/8, ZINC PLT .688 OD, .382 I	4.000 EA
HW5100A13	W4627-047 WVY WSHER	1.000 EA
HA4017A11	1/8 X 2.75 GREASE EXT (F/S)	1.000 EA
HA4017A03	.125 X 1.75 GREASE EXT (F/S)	1.000 EA
HA4024A02	1/8 DOUBLE FEMALE SS CPLG, MCM #4464K351	1.000 EA
10XN3118K36	5/16-18 X 2.25" HEX HD, GRADE 5	4.000 EA
10EP1305A01P	PU ENDPLATE, MACH W/EPOXY	1.000 EA
10XN3816K28	3/8-16 X 1.75 HEX HD CAP SCREW, GRADE 5	4.000 EA
HW4600B40	V-RING SLINGER 2.000 X 2.680 X 0.280	1.000 EA
10XN3118K40	5/16-18 X 2.50" HEX HD, GRADE 5	4.000 EA

Parts List (continued)		
Part Number	Description	Quantity
10FH1007P	FAN COVER, CAST W/EPOXY PRIMER	1.000 EA
10XN3118K20	5/16-18 X 1 1/4 GRADE 5 STEEL ZC PLATED	3.000 EA
HW1001A31	LOCKWASHER 5/16, ZINC PLT .591 OD, .319 I	3.000 EA
10CB1503A01P	CONDUIT BOX LIPPED LID, MACH W/EPXY PRMR	1.000 EA
14GS1003	GASKET CONDUIT BOX LID, NEOP	1.000 EA
10XN2520K16	1/4-20 X 1" HX HD SCRW GRADE 5, ZINC P	4.000 EA
HW1001A25	LOCKWASHER 1/4, ZINC PLT .493 OD, .255 I	4.000 EA
HW2501H28	KEY, 1/2 SQ X 3.250	1.000 EA
MJ5001A01	46-665 RED SEALER	0.031 QT
MJ5001A14	DYNAPRO SEAL, CP MOTORS VC#2508050 (603	0.026 EA
LB1115	LABEL, LIFTING DEVICE	1.000 EA
LB1002	LABEL, MARINE DUTY (ON ROLLS)	1.000 EA
LB5040	INSTRUCTION TAG, AC & DC	1.000 EA
10EP1110A06GP6	FREP, MACH W/PRIMER & GREEN PAINT	1.000 EA
HW4500A21	1618BALEMITE FITTING 825 UNIVERSAL	1.000 EA
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
HA4001A01SP	DRAIN PLUG, PLASTIC (MICRO PLAS)	1.000 EA
HA4051A00	PLASTIC CAP FOR GREASE FITTING	1.000 EA
MJ1000A75	GREASE, POLYREX EM EXXON	0.130 LB
HW4500A17	317400 ALEMITE GREASE RELIEF	1.000 EA
HW4500A03	GREASE FITTING, .125 NPT 1610(ALEMITE) 8	1.000 EA
HA4001A01SP	DRAIN PLUG, PLASTIC (MICRO PLAS)	1.000 EA
HA4051A00	PLASTIC CAP FOR GREASE FITTING	1.000 EA
HW2500A25	WOODRUFF KEY USA #1008 #BLOW CARBON STEE	1.000 EA

Parts List (continued)		
Part Number	Description	Quantity
51XB1214A20	12-14X1.25 HXWSSLD SERTYB	1.000 EA
MG1025N19	PAINT, 778.50 WILKO, RELIANCE ELEC GREEN	0.070 GA
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	2.000 EA
LB1125C02	SUPER-E (STOCK CTN LABEL SUPER-E WITH FL	4.000 EA
LB1357	ENERGY GUIDE LABEL (BOX LABEL)	1.000 SH
LC0005E02	SPL CONN.DIA./WARN.LABEL(LC0005/LB1119)	1.000 EA
NP1260E	SS CP SUPER-E UL CSA CC	1.000 EA
10PA1000	PACKAGING GROUP COMBINED PRINT PK1023A06	1.000 EA

Performance Data at 460V, 60Hz, 25.0HP (Typical performance - Not guaranteed values)

General Characteristics

Full Load Torque:	74.2 LB-FT	Start Configuration:	DOL
No-Load Current:	11.3 Amps	Break-Down Torque:	235.0 LB-FT
Line-line Res. @ 25°C.:	0.307 Ohms A Ph / 0.0 Ohms B Ph	Pull-Up Torque:	98.1 LB-FT
Temp. Rise @ Rated Load:	52 C	Locked-Rotor Torque:	123.0 LB-FT
Temp. Rise @ S.F. Load:	63 C	Starting Current:	186.0 Amps

Load Characteristics

% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor:	50.0	73.0	81.0	85.0	86.0	85.0	86.0
Efficiency:	88.7	92.3	93.5	93.6	93.1	92.0	93.3
Speed:	1793.0	1785.0	1779.0	1771.0	1763.0	1755.0	1766.0
Line Amperes:	13.3	17.6	23.3	29.6	36.5	44.2	33.7

Performance Graph at 460V, 60Hz, 25.0HP Typical performance - Not guaranteed values

