



INSTALLATION AND OPERATION OF STERLING ELECTRIC STERLI-SEAL (WASHDOWN) WAFERTHIN MOTORS WITH TAPERED DRIVE END AND INPRO SEAL

DANGER

ONLY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THE EQUIPMENT AND THE HAZARDS INVOLVED SHOULD INSTALL, ADJUST, OPERATE, AND/OR SERVICE THIS EQUIPMENT. READ AND UNDERSTAND THIS MANUAL IN ITS ENTIRETY BEFORE PROCEEDING. FAILURE TO OBSERVE THIS CAUTION RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

DESCRIPTION

Your Sterling AC squirrel cage induction motor is design and manufactured to give you years of trouble-free operation as well as outstanding performance. While little or no maintenance is required under normal conditions, standard practices of storage, installation, and operation should be followed in order to ensure the best results.

Design Features for Sterli-Seal (Washdown) Wafertthin Motors:

- Tapered drive end bracket to allow ease of cleaning and prevent accumulation of water and debris.
- Cast Iron frame and end brackets.
- Steel fan cover.
- Cast Iron Conduit box is provided with lead seal and gasket supported with a steel ring clamp.
- Class F insulation with Encapsulated windings.
- Epoxy spray coated rotor.
- Totally Enclosed, Fan Cooled motor with 1.15 service factor.
- Water proof per NEMA 1-1.26E.
- Double row angular contact bearing on drive end, single row double sealed ball bearing on fan end.
- Drive end bearing locked to prevent axial movement of the motor shaft.
- Stainless steel nameplate.
- Stainless steel hardware.
- INPRO/SEAL® bearing isolator in drive end. Double lip seal on fan end.
- All machined fits sealed with RTV sealant.
- 3-layer FDA / USDA approved stainless steel impregnated epoxy finish for severe duty applications.

RECEIVING

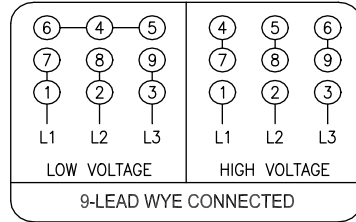
1. Check nameplate data.
2. Check whether any damage has occurred during transportation. If there is evidence of rough handling or potential damage in shipment, file a claim immediately with the carrier.
3. Notify your Sterling Electric sales representative.
4. Turn motor shaft by hand to check that it turns freely.

POWER SUPPLY AND CONNECTIONS

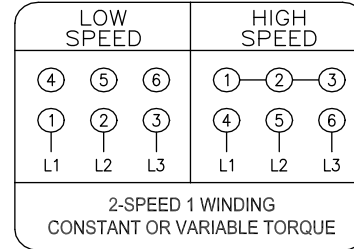
1. Nameplate voltage and frequency should agree with power supply. Motor will operate satisfactorily on line voltage within 10% of nameplate value; or frequency within 5%; combined variation not to exceed 10%. 230-volt motors can be used on 208-volt network systems, but with slightly modified performance characteristics.
2. Dual voltage motors can be connected for the desired voltage by following the connection diagram on the nameplate or the connection diagram on the inside of the terminal box cover.
3. Multi-speed motors are single voltage only. Check the nameplate to ensure proper voltage and connect per the connection diagram on the inside of the terminal box cover.
4. Wiring of motor and motor control, overload protection and grounding should be in accordance with the National Electric Code and/or local building codes.

CONNECTION INFORMATION

SINGLE SPEED



MULTI SPEED



START UP

1. Dry the motor windings if motor has been stored in a damp location. In drying, DO NOT exceed 194 degrees F (90 degrees C).
2. Disconnect load and start motor. Check direction of rotation. Interchange any two line leads to reverse rotation on three phase motors. Fans, on fan cooled motors that have directional rotation nameplates, must be changed if rotation is changed.
3. Connect motor to load. The motor should start up quickly and run smoothly. If not, shut power off at once. Recheck the assembly including all connections before restarting.
4. Operate under load for at least one hour. Observe whether any unusual noise or heating has developed and check operating current against nameplate data.
5. If excessive vibration is noted, check for loose mounting bolts, too flexible motor support structure, or transmitted vibration from adjacent machinery.

GENERAL MAINTENANCE

1. Inspect motor at regular intervals. Keep motor clean and ventilating openings clear of any obstructions.
2. Pre-lubricated, double sealed bearings have been installed with extra lubrication in the bearing housing. No further lubrication is required.

WASHDOWN APPLICATIONS MAINTAINENCE

These motors are supplied with a one-way condensation drain plug located on the motor fan end and visible through the fan cover. When washing down of the motor occurs, care should be taken to avoid introducing water, steam, or detergent into the motor. Drain areas should be checked periodically for debris and cleaned as required. Clogged drains can allow moisture to accumulate on the lower parts of the motor, to the point of bearing and /or winding failure.

TROUBLE SHOOTER'S GUIDE BASED ON SYMPTOMS

SYMPTOMS	CAUSE	RESULT	REMEDY
1. Motor does not start.	a. Incorrectly connected.	a. Burnout	a. Connect correctly per diagram on motor.
	b. Incorrect power supply.	b. Burnout	b. Use only with correct rated power supply.
	c. Fuse out, loose or open connection.	c. Burnout	c. Correct open circuit condition.
	d. Open control circuit.	d. None	d. Correct open circuit condition.
	e. Rotating parts of motor may be jammed mechanically.	e. Burnout	e. Check and correct: 1. Bent shaft 2. Broken housing 3. Damaged bearing 4. Jammed or broken fan 5. Foreign material in motor
	f. Driven machine may be jammed.	f. Burnout	f. Correct jammed condition.
	g. No power supply.	g. None	g. Check voltage at motor and work back to power supply.
2. Motor starts, but does not come up to speed.	a. Same as 1-a, b, c above.		
	b. Overload	b. Burnout	b. Reduce load to bring current to rated limit. Use proper fuses and overload protection.
3. Motor noisy electrically	a. Same as 1-a, b, c above.		
4. Motor runs hot. Exceeds rating.	a. Same as 1-a, b, c above.		
	b. Overload	b. Burnout	b. Reduce load.
	c. Impaired ventilation.	c. Burnout	c. Remove obstruction.
	d. Frequent start or stop.	d. Burnout	d. 1. Reduce number of starts or reversals. 2. Secure proper motor for this duty.
	e. Imbalance in voltage or frequency of power supply.	e. Burnout	e. Check and correct power supply.
SYMPTOMS-CONT.	CAUSE	RESULT	REMEDY
5. Motor noisy (mechanically)	a. Misalignment of coupling or sprocket.	a. Bearing failure, broken shaft, burnout due to rotor drag.	a. Correct misalignment.
	b. Mechanical unbalance of rotating parts.	b. Same as 5-a	b. Find unbalanced part, then rebalance.
	c. Lack of or improper lubricant.	c. Bearing failure	c. Use correct lubricant, and replace parts as necessary.
	d. Foreign material in lubricant.	d. Same as 5-c	d. Clean out or replace bearing.
	e. Overload	e. Same as 5-c	e. Remove overload condition. Replace damaged parts.
5. Motor noisy (mechanically)	f. Shock load.	f. Same as 5-c	f. Correct causes and replace damaged parts.
	g. Mounting acts as amplifier of normal noise.	g. Annoying	g. Isolate motor from base.
	h. Rotor dragging due to worn bearings, shaft or bracket	h. Burnout	h. Replace bearings, shaft or bracket as needed.
6. Bearing failure	a. Same as 5-a, b, c, d, e above.	a. Burnout, damaged shaft or housing	a. Replace bearings and follow 5-a, b, c, d, e above.
	b. Entry of water or foreign material into bearing housing.	b. Same as 6-a above	b. Replace bearings and shield against entry of foreign material (water, dust, etc.) Use proper motor.

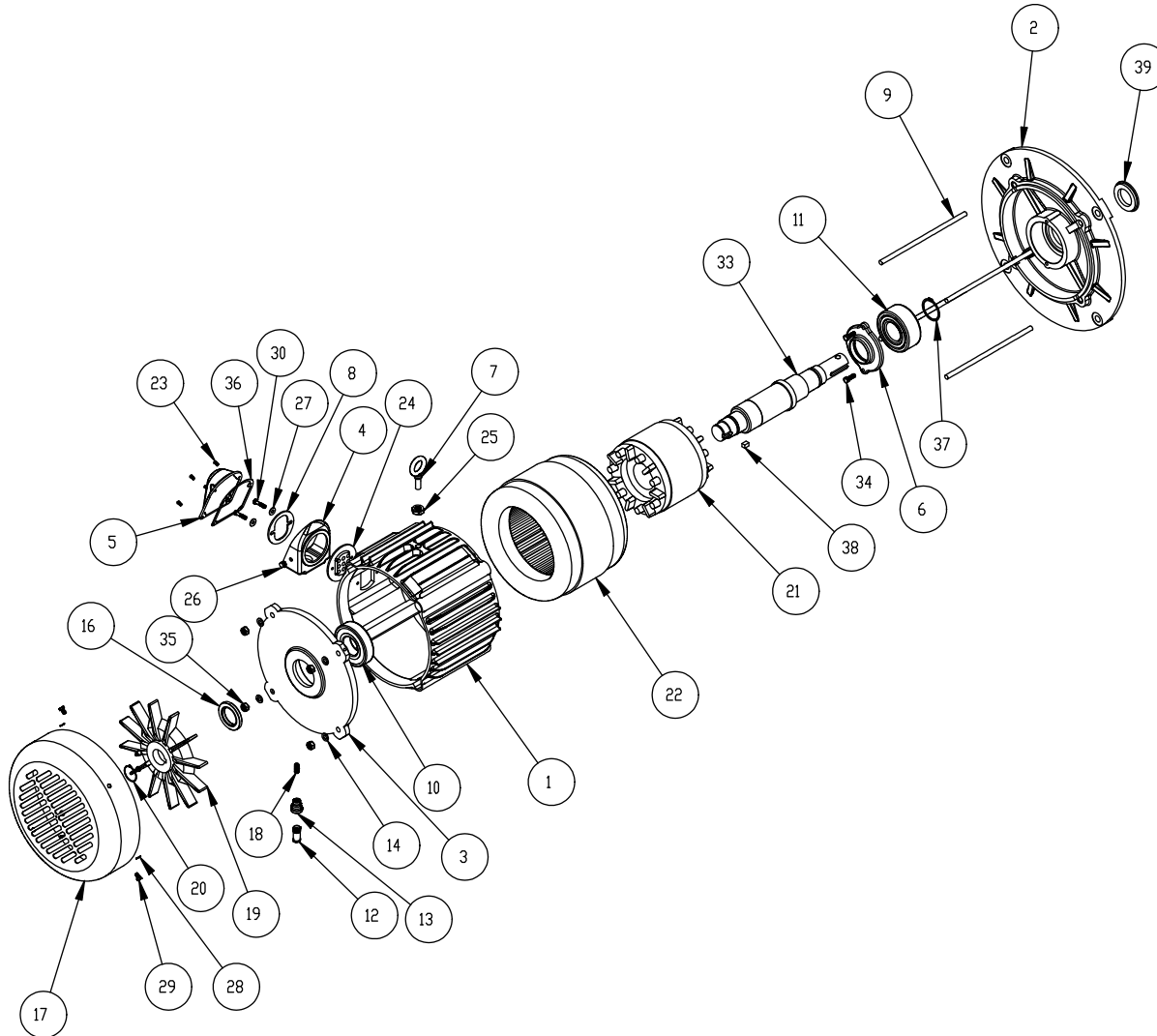
TYPICAL BURNOUT PATTERNS

SYMPTOM	CAUSED BY	APPEARANCE
1. Shorted coil	a. Moisture, chemicals, foreign material in motor, damage winding.	a. Black or burned coil with remainder of winding good.
2. 100% Burnout	a. Overload.	a. Burned equally all around winding.
	b. Stalled.	b. Burned equally all around winding.
	c. Impaired ventilation.	c. Burned equally all around winding.
	d. Frequent reversal or starting.	d. Burned equally all around winding.
	e. Incorrect power.	e. Burned equally all around winding.
3. Single phase condition.	a. Open circuit in one line. The most common causes are loose connection, one fuse out, loose contact in switch or contactor.	a. If 1800 RPM motor-four equally burned groups at 90° intervals. b. If 1200 RPM motor-six equally burned groups at 60° intervals. c. If 3600 RPM motor-two equally burned groups at 180° apart. NOTE: If WYE connected each burned group will consist of two adjacent phase groups. If DELTA connected each burned group will consist of one phase group.
4. Other	a. Improper connection.	a. Irregular burned groups or spot burns.
	b. Ground	b. Badly damaged burn spot.

The following pages contain parts lists based on the motor frame size. The motor frame size is stamped on the nameplate. Refer to this information when determining what parts list to reference.

PARTS LIST

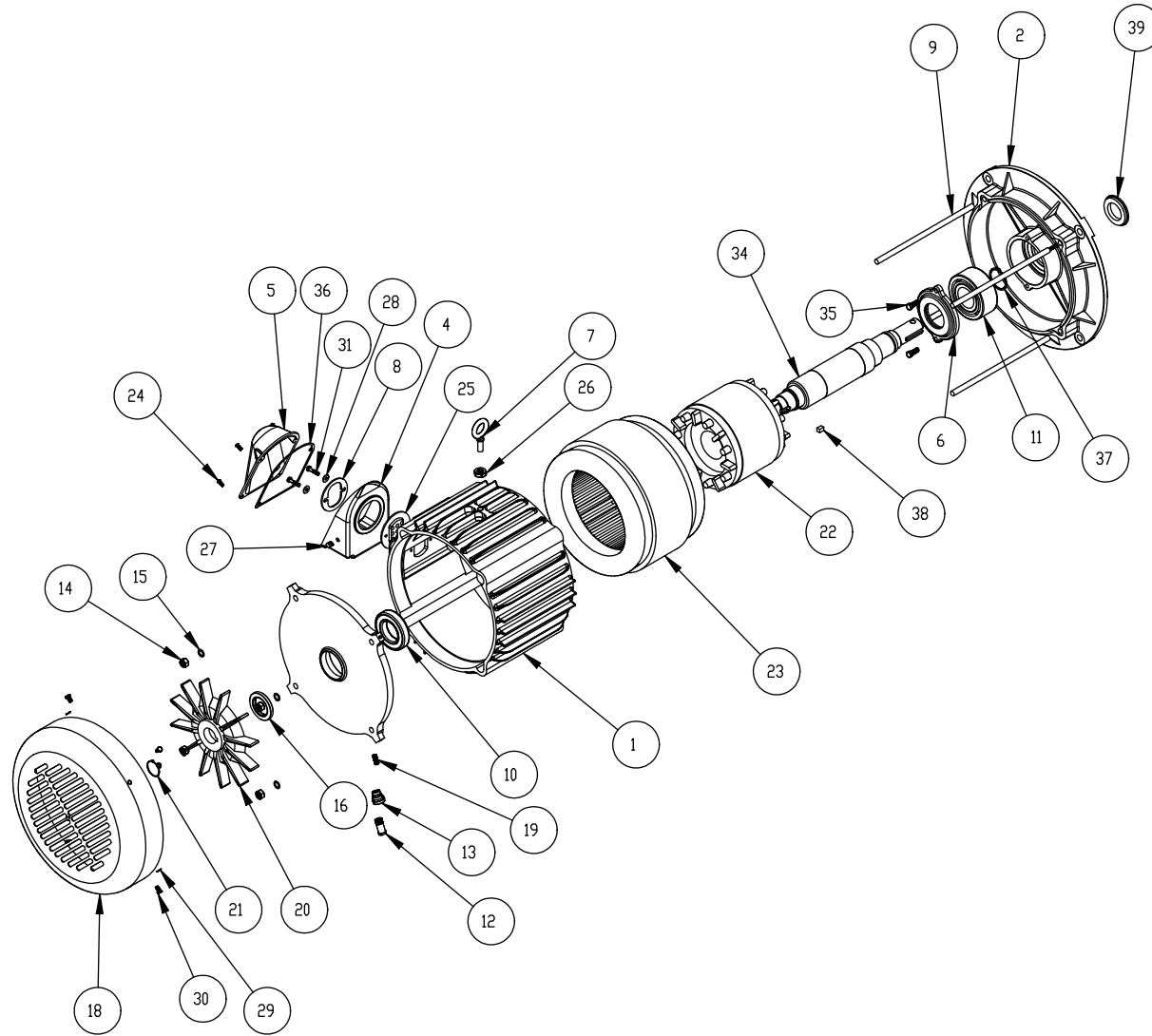
28 FRAME



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	202-0482-8	28, FOOTLESS FRAME TOTALLY ENCLOSED	1
2	204-2078-2	28 FRAME, BRACKET, P.E. - SHORT STACK MOTOR	1
3	204-2002-8	BRACKET, S.E.- SHORT STACK MOTOR	1
4	238-0228-8	TERMINAL BOX *SHORT STACK MOTOR*	1
5	240-0174-1	COVER, TERMINAL BOX	1
6	244-0199-1	BEARING CAP, 5310 DOUBLE ROW BEARING W/ GROOVE FOR FIBER PACKING	1
7	299-0911-3	LIFTING DEVISE	1
8	299-1049-9	TERM. BOX CLAMP	1
9	418-1657-3	7/16-14 x 11.5, 18-8 ROD	4
10	400-0138-7	6310 DBL SEALED BALL BEARING	1
11	400-0163-8	5310 OPEN ANG CONTACT BRG	1
12	499-1593-4	DRAIN & BREATHER	1
13	499-2349-9	3/8 TO 1/8 NPT ADAPTER	1
14	418-0955-8	7/16 LOCK WASHER 18-8	4
16	404-0108-3	SEAL C/R 18734 (1.875x2.876x.312)	1
17	49926855	28 FRAME FAN COVER	1
18	499-2349-9C	CDUPLING	1
19	206-0249-9	FAN, SHORT STACK MOTOR (BREDDO)	1
20	499-1348-6	5100-162 SNAP RING	1
21	PER HP RATING	ROTOR CORE	1
22	PER HP RATING	WOUND STATOR CORE	1
23	418-0472-6	8-32 x .375 RDHD SCREW	4
24	499-0674-9	LEAD SEAL ENCLOSURE A	1
25	418-0042-9	NUT-HEX.JAM 5/8-11	1
26	418-1116-1	DRAIN BRTHR PLUG 1/8 NPT	1
27	418-1400-0	5/16 x 3/4 x 1/16 WASHER	2
28	418-1569-1	1/4IN. LOCK WASHER	4
29	418-1613-7	1/4-20 x 1/2 HEX HD 18-8	4
30	418-0169-7	1/4-20 x 1 1/4 HXHD SCREW	2
33	220-6198-4	28, TEFC 15/20HP 4P	1
34	418-1577-3	5/16-18 x 1LG HEX HD BOLT	2
35	418-1707-3	7/16-14 HEX NUT 18-8	4
36	499-1566-7	GASKET TERM BOX COV. A	1
37	499-2284-4	5100-215 SNAP RING	1
38	402-0281-1	3/8 SQ x 9/16LG KEY	1
39	404-0409-1	INPRD SEAL	1

PARTS LIST

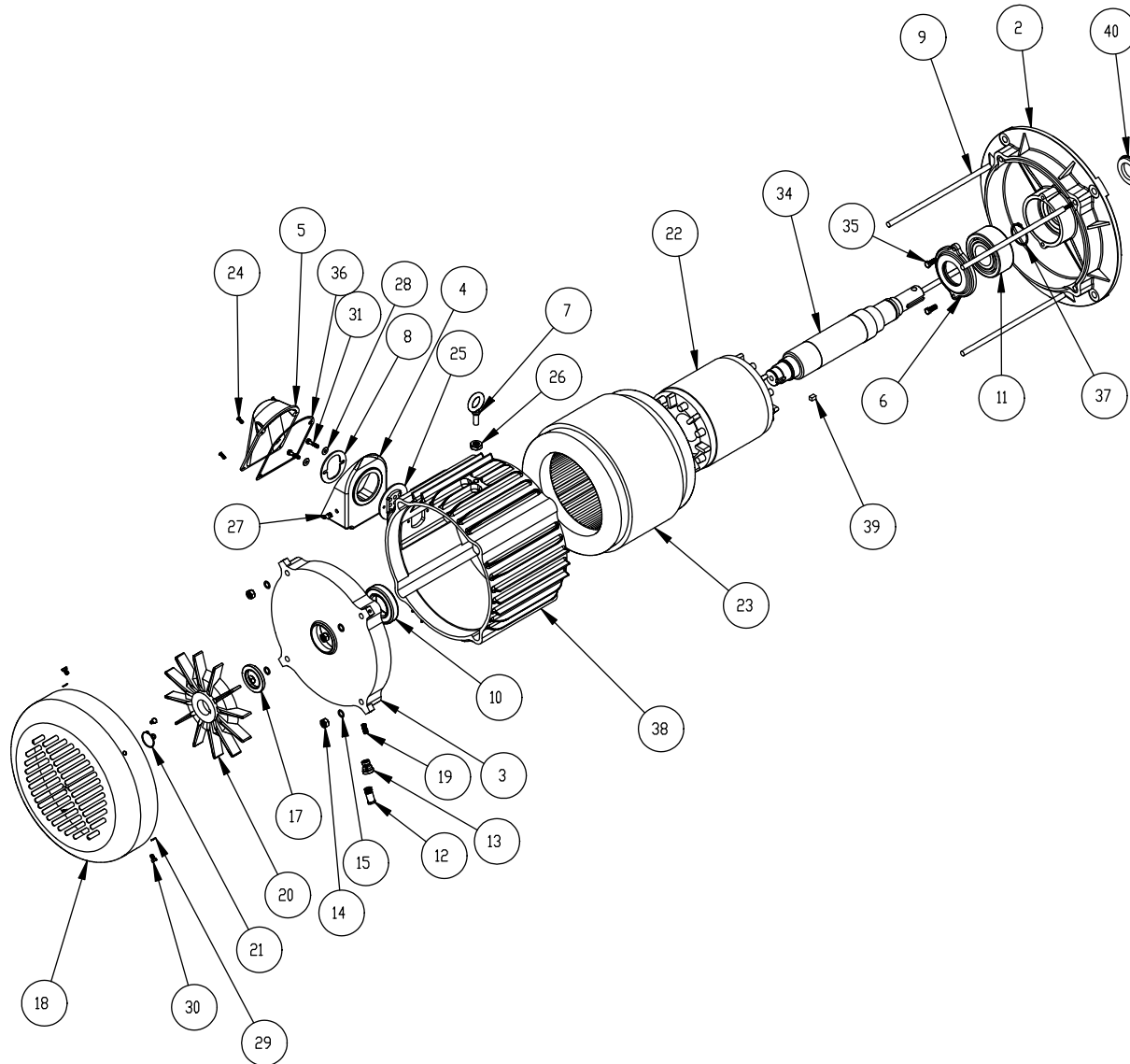
32 FRAME



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	202-0483-7	32, FOOTLESS FRAME TOTALLY ENCLOSED	1
2	204-2076-4	BRACKET, P.E. - SHORT STACK MOTOR	1
3	204-2001-9	BRACKET, S.E.- SHORT STACK MOTOR	1
4	238-0201-5	TERMINAL BOX 'SHORT STACK MOTOR'	1
5	240-0177-6	COVER, TERMINAL BOX	1
6	244-0200-0	BEARING CAP, 5311 DOUBLE ROW BEARING W/ GROOVE FOR FIBER PACKING	1
7	299-0911-3	LIFTING DEVICE	1
8	299-1049-9	TERM. BOX CLAMP	1
9	418-1675-5	1/2-13x13.0 18-8 ROD	4
10	400-0124-7	6211 DBL SEALED BEARING	1
11	400-0426-6	5311 OPEN ANG CONTACT BRG	1
12	499-1593-4	DRAIN & BREATHER	1
13	499-2349-9	3/8 TO 1/8 NPT ADAPTER	1
14	418-1628-2	1/2-13 18-8 HEX NUT	4
15	418-1629-1	1/2IN. 18-8 LOCK WASHER	4
16	404-0108-3	SEAL C/R 18734 (1.875x2.876x.312)	1
18	499-2684-6	FAN COVER 32 & 32XL FRAME SIZE	1
19	499-2349-9C	COUPLING	1
20	206-0249-9	FAN, SHORT STACK MOTOR (BREDDO)	1
21	499-1348-6	5100-162 SNAP RING	1
22	PER HP RATING	ROTOR CORE	1
23	PER HP RATING	WOUND STATOR CORE	1
24	418-0482-3	SCR, RD HD 10-24x5/8	4
25	499-0674-9	LEAD SEAL ENCLOSURE A	1
26	418-0042-9	NUT-HEX.JAM 5/8-11	1
27	418-1116-1	DRAIN BRTHR PLUG 1/8 NPT	1
28	418-1400-0	5/16 x 3/4 x 1/16 WASHER	2
29	418-1569-1	1/4IN. LOCK WASHER	4
30	418-1613-7	1/4-20 x 1/2 HEX HD 18-8	4
31	418-0169-7	1/4-20 x 1 1/4 HXHD SCREW	2
34	220-6197-3	32, TEFC 25/30HP 4P	1
35	418-0186-7	3/8-16 x 1LG HEX HD SCREW	2
36	499-1567-5	GASKET TERM BOX COV. A	1
37	499-2284-4	5100-215 EXTERNAL SNAP RING	1
38	402-0281-1	3/8 SQ x 9/16LG KEY	1
39	404-0409-1	INPRD SEAL	1

PARTS LIST

32XL FRAME



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
2	204-2076-4	BRACKET, P.E. - SHORT STACK MOTOR	1
3	204-2074-6	32XL S.E. BRACKET- SHORT STACK MOTOR	1
4	238-0201-5	TERMINAL BOX "SHORT STACK MOTOR"	1
5	240-0177-6	COVER, TERMINAL BOX	1
6	244-0200-0	BEARING CAP, 5311 DOUBLE ROW BEARING W/ GROOVE FOR FIBER PACKING	1
7	299-0911-3	LIFTING DEVISE	1
8	299-1049-9	TERM. BOX CLAMP	1
9	418-1709-1	1/2-13x17.5 18-8 ROD	4
10	400-0124-7	6211 DBL SEALED BEARING	1
11	400-0426-6	5311 OPEN ANG CONTACT BRG	1
12	499-1593-4	DRAIN & BREATHER	1
13	499-2349-9	3/8 TO 1/8 NPT ADAPTER	1
14	418-1628-2	1/2-13 18-8 HEX NUT	4
15	418-1629-1	1/2IN. 18-8 LOCK WASHER	4
17	404-0108-3	SEAL C/R 18734 (1.875x2.876x.312)	1
18	499-2684-6	FAN COVER 32 & 32XL FRAME SIZE	1
19	499-2349-9C	COUPLING	1
20	206-0249-9	FAN, SHORT STACK MOTOR (BREDDO)	1
21	499-1348-6	5100-162 SNAP RING	1
22	PER HP RATING	ROTOR CORE	1
23	PER HP RATING	WOUND STATOR CORE	1
24	418-0482-3	SCR, RD HD 10-24x5/8	4
25	499-0674-9	LEAD SEAL ENCLOSURE A	1
26	418-0042-9	NUT-HEX.JAM 5/8-11	1
27	418-1116-1	DRAIN BRTHR PLUG 1/8 NPT	1
28	418-1400-0	5/16 x 3/4 x 1/16 WASHER	2
29	418-1569-1	1/4IN. LOCK WASHER	4
30	418-1613-7	1/4-20 x 1/2 HEX HD 18-8	4
31	418-0169-7	1/4-20 x 1 1/4 HXHD SCREW	2
34	220-6199-5	32XL, TEFC 40HP 4P	1
35	418-0186-7	3/8-16 x 1LG HEX HD SCREW	2
36	499-1567-5	GASKET TERM BOX COV. A	1
37	499-2284-4	5100-215 EXTERNAL SNAP RING	1
38	202-0483-7	32, FOOTLESS FRAME TOTALLY ENCLOSED	1
39	402-0281-1	3/8 SQ x 9/16LG KEY	1
40	404-0409-1	INPRO SEAL	1