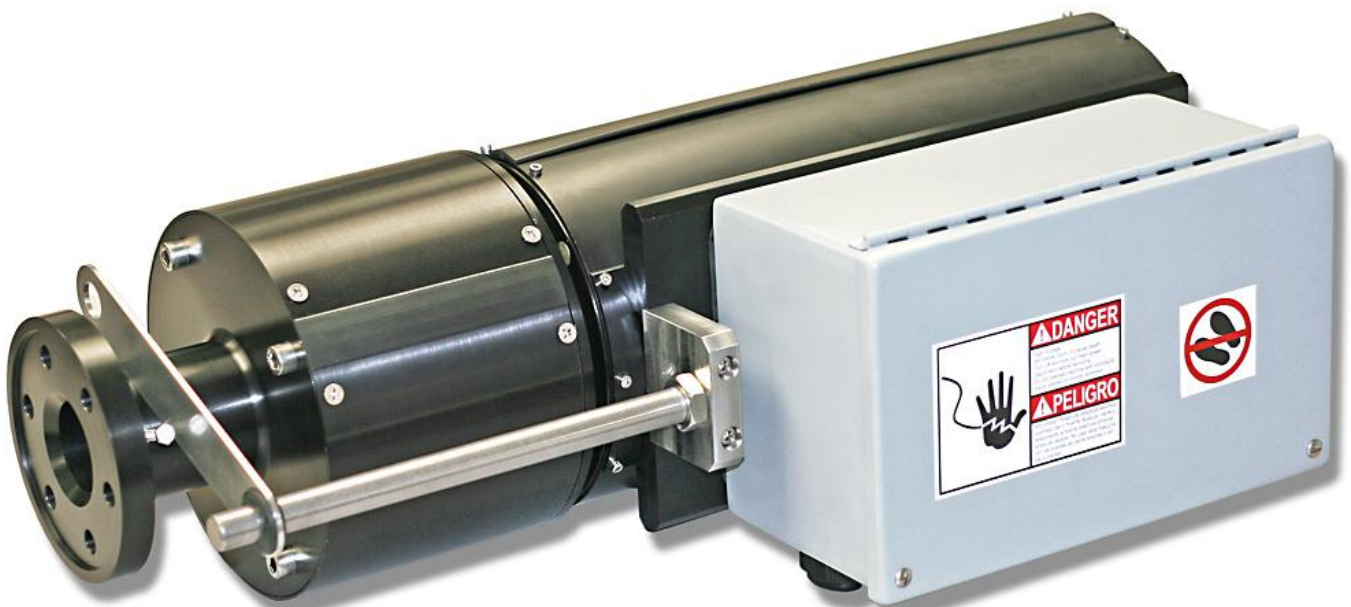


# Operation Manual for AC7008 Slip Ring Assembly

## Pitch Control Slip Ring Assembly



### Revision History

Date	Revision #	Description
1/27/2009	0	New Issue
6/23/09	1	Updates
8/17/09	2	Electrical Configuration Table Update and Photo
9/08/09	3	Outline Drawing
10/12/09	4	New Slip Ring Electrical Configuration Table
10/19/09	5	Updated Technical Specification
1/04/2012	6	Updated Mechanical Outline Drawings and Photo
1/18/2012	7	Updated Junction Box Photo

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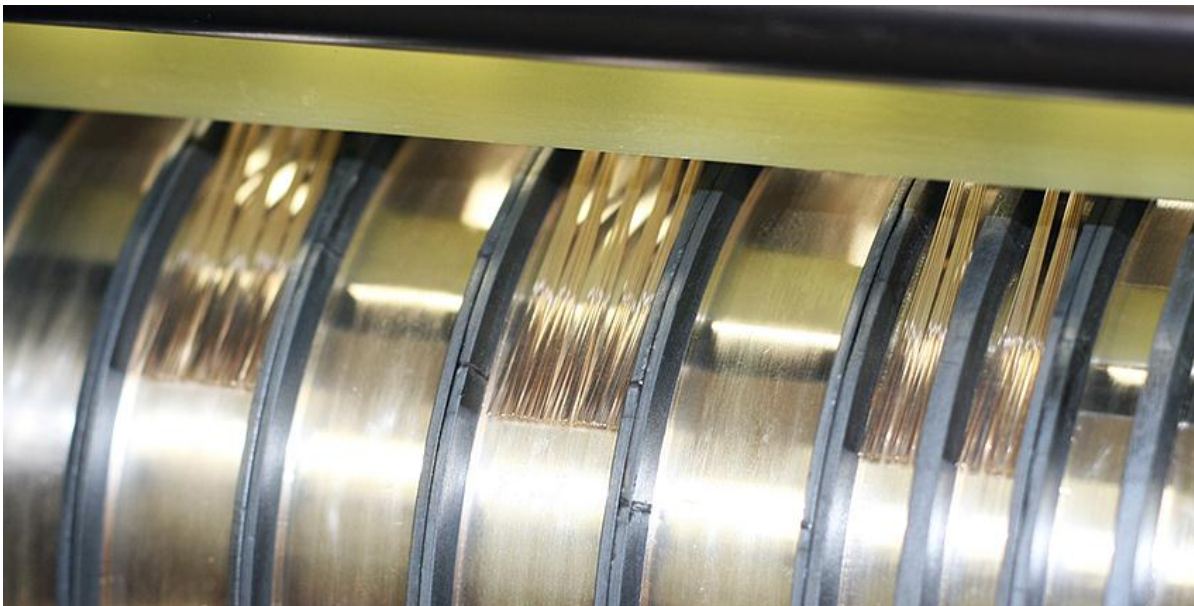
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## 1. Description of the Slip Ring

The Moog Components Group AC7008 slip ring is designed as a highly reliable, maintenance free product for use in the GE 1.5 MW pitch control system. The design uses fiber brush technology developed by Moog for critical military and space applications, and now used throughout our commercial / industrial and wind energy products.

The fiber brush technology involves the bundling of multiple metal filaments into a compact “brush” (Figure 1). Typically, these fibers are noble metal and the ring is noble metal plated. The noble metal surfaces prevent the formation of oxides from forming on the metal surfaces. The low contact forces achieved by the fiber brush technology, results in a very low wear rate, and eliminates the use of a contact lubricant. The multiple fibers provide very good conductivity and very high current densities, so the fiber brush can be used of both power and signal. As a final benefit, the fiber brush produces negligible wear debris, eliminating the need for maintenance to clean the assembly. Maintenance-free operation in excess of 100 million revolutions is expected.

The slip ring housing and junction box are black anodized for environmental protection and is sealed to IP54.



**Fiber Brush Contact Technology  
Figure 1**

## 2. Technical Specifications

Technical Specifications	
Weight	60 pounds
Brush Material	Silver alloy
Ring Material	Silver plate
Brush Life	> 100 million revolutions
Ring Life	> 100 million revolutions
Lubrication	No lubrication required
Cleaning / Maintenance Interval	No maintenance required
Power Circuit Rating	65 amps at 600 volts
Communication Lines	100 Mbps
Operating Temperature	-40° C to +80° C
Heating Element	13 watt, 240 volts standard
Sealing	IP 54

**Technical Specifications  
Table 1**

### 3. Slip Ring Electrical Configuration

	Group 1	Group 2	Group 3	Group 4
<b>Circuit Numbers</b>	PE, L1, L2, L3, N	1PE, 1L1, 1L2, 1L3, 1N	1 through 10 STOW	11 Through 25
<b>Number of Leads</b>	5	5	11	15
<b>Nominal Current</b>	65 Amps	16 Amps	16 Amps	Data Lines
<b>Max Operating Voltage</b>	600 V	600 V	230 V	24 VDC
<b>Wire Gauge</b>	8 AWG	14 AWG	14 AWG	16 AWG and 20 AWG

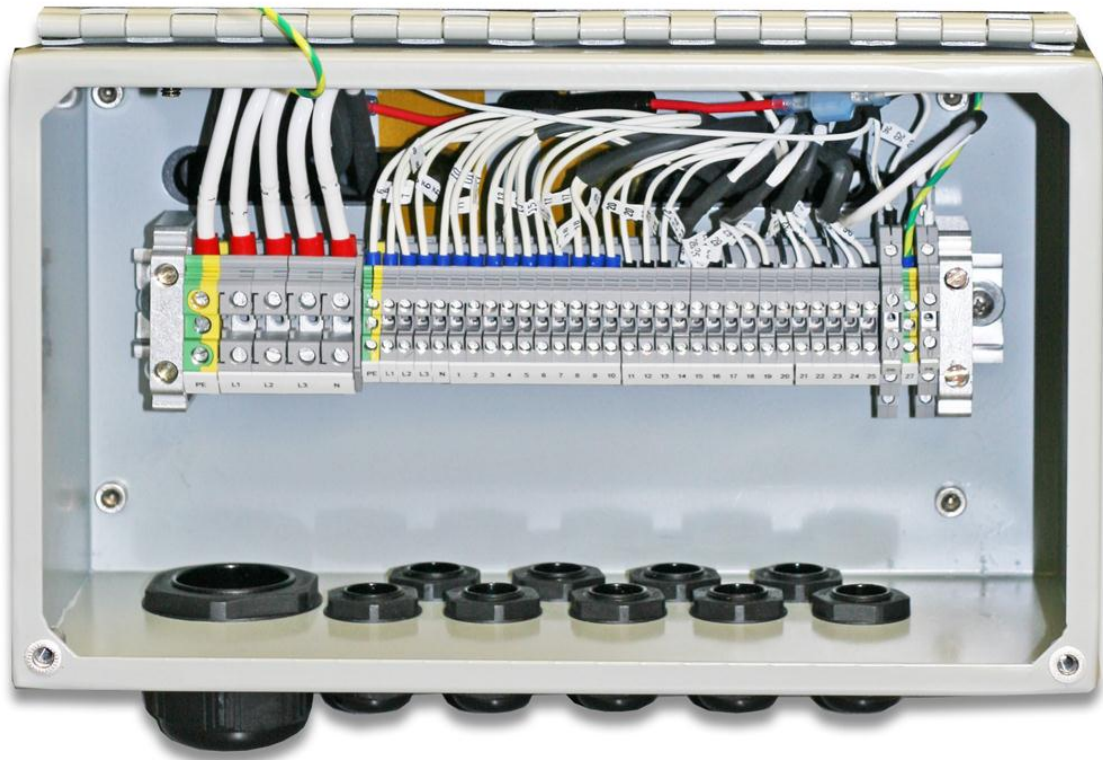
This unit has a heater for condensation reduction. the heater is 30 watt output, 240 V. To connect heater provide 240 V supply to the 3-position terminal #26 in the stator junction box. The heater circuit is fused with a .3 Amp / 250 V MDL buss fuse. Stator 3-position terminal #28 is the connection for the RTD temperature probe.

### 4. Slip Ring Installation

- Ensure power is disconnected from the pitch control system.
- The umbilical harness exiting from the gearbox should be inspected for damaged wires / pins and repaired as required.
  
- Remove split cover from Rotor Junction Box.
- Insert the harness into the slip ring and connect harness wires to the corresponding terminal blocks. Screws in terminal blocks should be securely tightened.



- After installation of wires to terminals, tighten strain relief clamp to retain harness to slip ring.
- Re-install split cover taking care to align seal strips.
- Bolt slip ring securely to the turbine gear box. Tighten bolts to required specification.
- Remove stationary junction box cover.
- Insert stationary wires through the appropriate fitting in the side of the junction box and connect to appropriate terminal blocks.



- Tighten nuts on cable fittings to relieve the strain on the junction box cables. Plugs for cable glands are provided for sealing of any unused fittings.
- Re-install junction box cover.

## 5. Maintenance Procedures

- There is no regular or preventive maintenance required for the Moog AC7008 slip ring capsule.
- Periodic inspection of brushes and rings is not required.

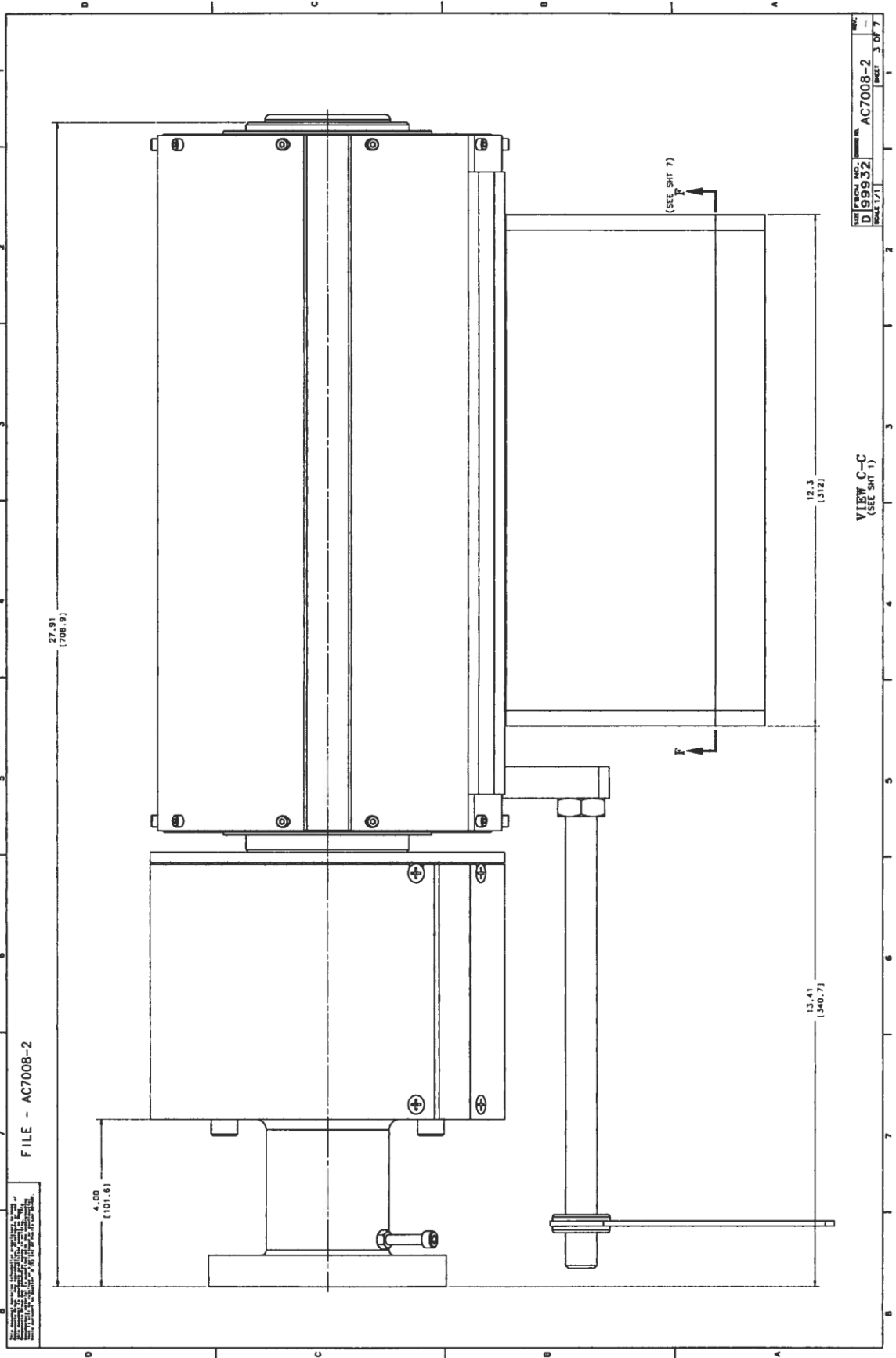
## 6. Storage of Slip Rings

- a. Store slip rings in a dry location.
- b. Slip ring weighs approximately 60 pounds. Use caution when lifting.

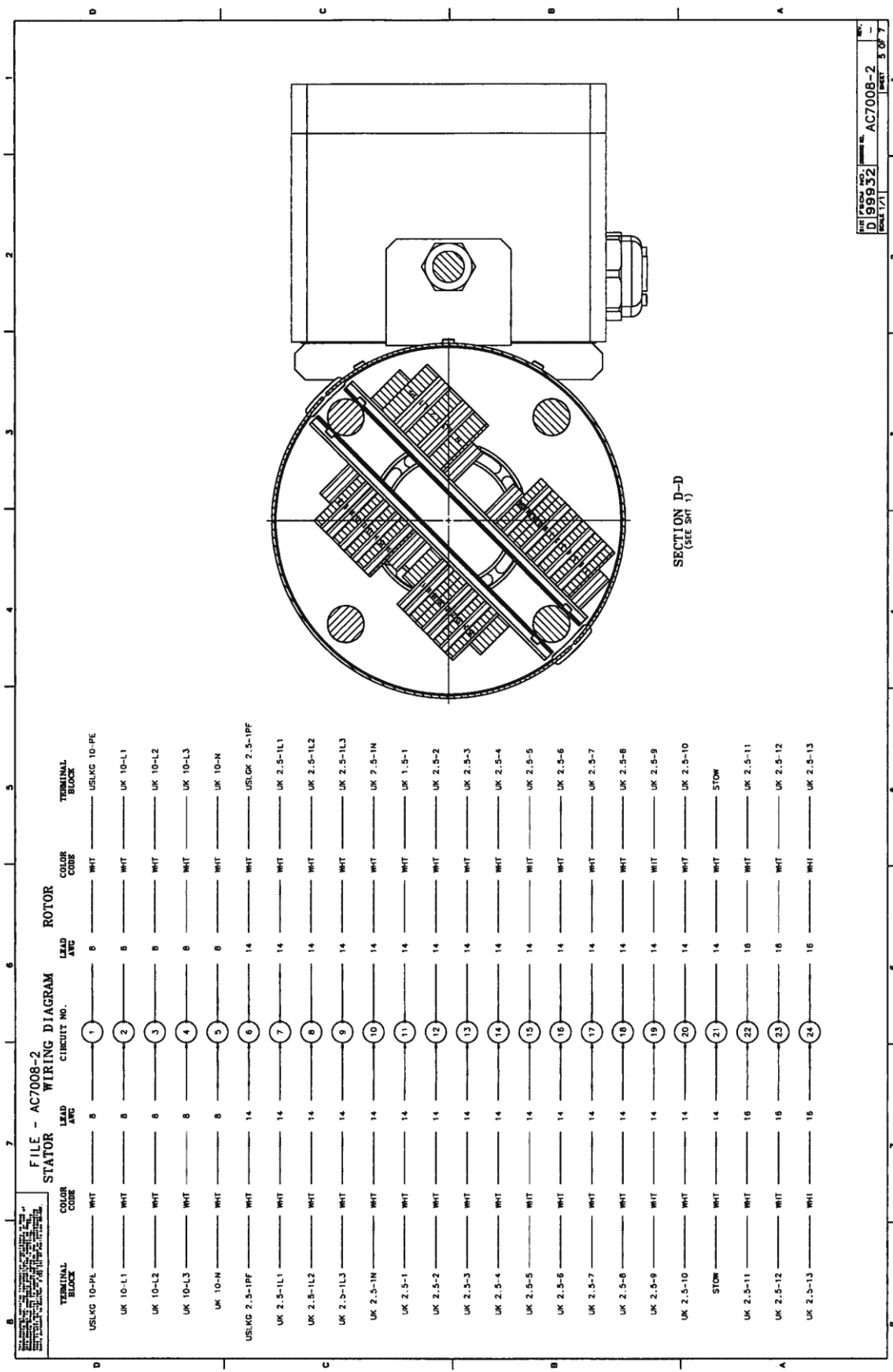
## 7. Spare Parts List

Item #	Part #	Description
1	7008 009 000	Stator junction box cover
2	8E6MOCZH10	Junction box screw M6-11.0 x 10 mm
3	8LSAX094EO	H channel gasket
4	7008 028 000	Rotor junction box cover
5	7008 013 000	De-rotation strap
6	7008 014 000 7008 015 000	Cable clamp and screw
7	BL AAX 75OSO	Torque arm grommet

## 8. Mechanical Outline Drawings







FILE - AC7008-2  
 STATOR WIRING DIAGRAM

TERMINAL BLOCK	COLOR CODE	LEAD AWC	CIRCUIT NO.	LEAD AWC	ROTOR	COLOR CODE	TERMINAL BLOCK
USLKG 10-PL	WHT	8	1	8	USLKG 10-PE	WHT	USLKG 10-PE
UK 10-L1	WHT	8	2	8	UK 10-L1	WHT	UK 10-L1
UK 10-L2	WHT	8	3	8	UK 10-L2	WHT	UK 10-L2
UK 10-L3	WHT	8	4	8	UK 10-L3	WHT	UK 10-L3
UK 10-N	WHT	8	5	8	UK 10-N	WHT	UK 10-N
USLKG 2.5-1PF	WHT	14	6	14	USLKG 2.5-1PF	WHT	USLKG 2.5-1PF
UK 2.5-1L1	WHT	14	7	14	UK 2.5-1L1	WHT	UK 2.5-1L1
UK 2.5-1L2	WHT	14	8	14	UK 2.5-1L2	WHT	UK 2.5-1L2
UK 2.5-1L3	WHT	14	9	14	UK 2.5-1L3	WHT	UK 2.5-1L3
UK 2.5-1N	WHT	14	10	14	UK 2.5-1N	WHT	UK 2.5-1N
UK 2.5-1	WHT	14	11	14	UK 1.5-1	WHT	UK 1.5-1
UK 2.5-2	WHT	14	12	14	UK 2.5-2	WHT	UK 2.5-2
UK 2.5-3	WHT	14	13	14	UK 2.5-3	WHT	UK 2.5-3
UK 2.5-4	WHT	14	14	14	UK 2.5-4	WHT	UK 2.5-4
UK 2.5-5	WHT	14	15	14	UK 2.5-5	WHT	UK 2.5-5
UK 2.5-6	WHT	14	16	14	UK 2.5-6	WHT	UK 2.5-6
UK 2.5-7	WHT	14	17	14	UK 2.5-7	WHT	UK 2.5-7
UK 2.5-8	WHT	14	18	14	UK 2.5-8	WHT	UK 2.5-8
UK 2.5-9	WHT	14	19	14	UK 2.5-9	WHT	UK 2.5-9
UK 2.5-10	WHT	14	20	14	UK 2.5-10	WHT	UK 2.5-10
STOW	WHT	14	21	14	STOW	WHT	STOW
UK 2.5-11	WHT	16	22	16	UK 2.5-11	WHT	UK 2.5-11
UK 2.5-12	WHT	16	23	16	UK 2.5-12	WHT	UK 2.5-12
UK 2.5-13	WHT	16	24	16	UK 2.5-13	WHT	UK 2.5-13

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NOTES :

1. DIELECTRIC STRENGTH SHALL BE CHECKED AT 500 VOLTS, 60 HZ, BETWEEN EACH CIRCUIT AND ALL OTHER CIRCUITS AND BETWEEN EACH CIRCUIT AND STRUCTURAL MEMBER.
2. INSULATION RESISTANCE SHALL BE 1000 MEGOHMS MIN WHEN CHECKED BETWEEN EACH CIRCUIT AND ALL OTHER CIRCUITS AND BETWEEN EACH CIRCUIT AND STRUCTURAL MEMBER AT 500 VDC.
3. CIRCUIT RESISTANCE SHALL BE .034 MILLI OHMS MAX PER INCH OF LEAD, INCLUDING INTERNAL LEAD FOR CIRCUIT NO'S 8 - 21, .33 MILLI OHMS MAX PER INCH OF LEAD, INCLUDING INTERNAL LEAD FOR CIRCUIT NO'S 22 - 24, AND .84 MILLI OHMS MAX PER INCH OF LEAD, INCLUDING INTERNAL LEAD FOR ALL OTHER CIRCUITS.
4. TAG ALL LEADS WITH APPROPRIATE CIRCUIT NO.'S.
5. NOISE SHALL BE 100 MILLI OHMS MAX WHEN ROTATED AT 5-15 RPM AT 50 MILLI AMPS.

WIRING DIAGRAM

STATOR

LEAD ANG

COLOR CODE

TERMINAL BLOCK

UK 2.5-14 20 BLK

UK 2.5-15 20 WHT

UK 2.5-16 16 WHT

UK 2.5-17 20 BLK

UK 2.5-18 20 WHT

UK 2.5-19 16 WHT

UK 2.5-20 20 BLK

UK 2.5-21 20 WHT

UK 2.5-22 16 WHT

UK 2.5-23 20 BLK

UK 2.5-24 20 WHT

UK 2.5-25 16 WHT

D1KD 1.5-26 16 WHT

D1KD 1.5-26 16 WHT

USLKG 2.5-27 14 GRN/YEL

D1KD 1.5-28 20 WHT

D1KD 1.3-28 20 RED

ROTOR

LEAD ANG

COLOR CODE

TERMINAL BLOCK

20 BLK UK 2.5-14

20 WHT UK 2.5-15

16 WHT UK 2.5-16

20 BLK UK 2.5-17

20 WHT UK 2.5-18

16 WHT UK 2.5-19

20 BLK UK 2.5-20

20 WHT UK 2.5-21

16 WHT UK 2.5-22

20 BLK UK 2.5-23

20 WHT UK 2.5-24

16 WHT UK 2.5-25

WIRING DIAGRAM

CIRCUIT NO.

25

26

27

28

29

30

31

32

33

34

35

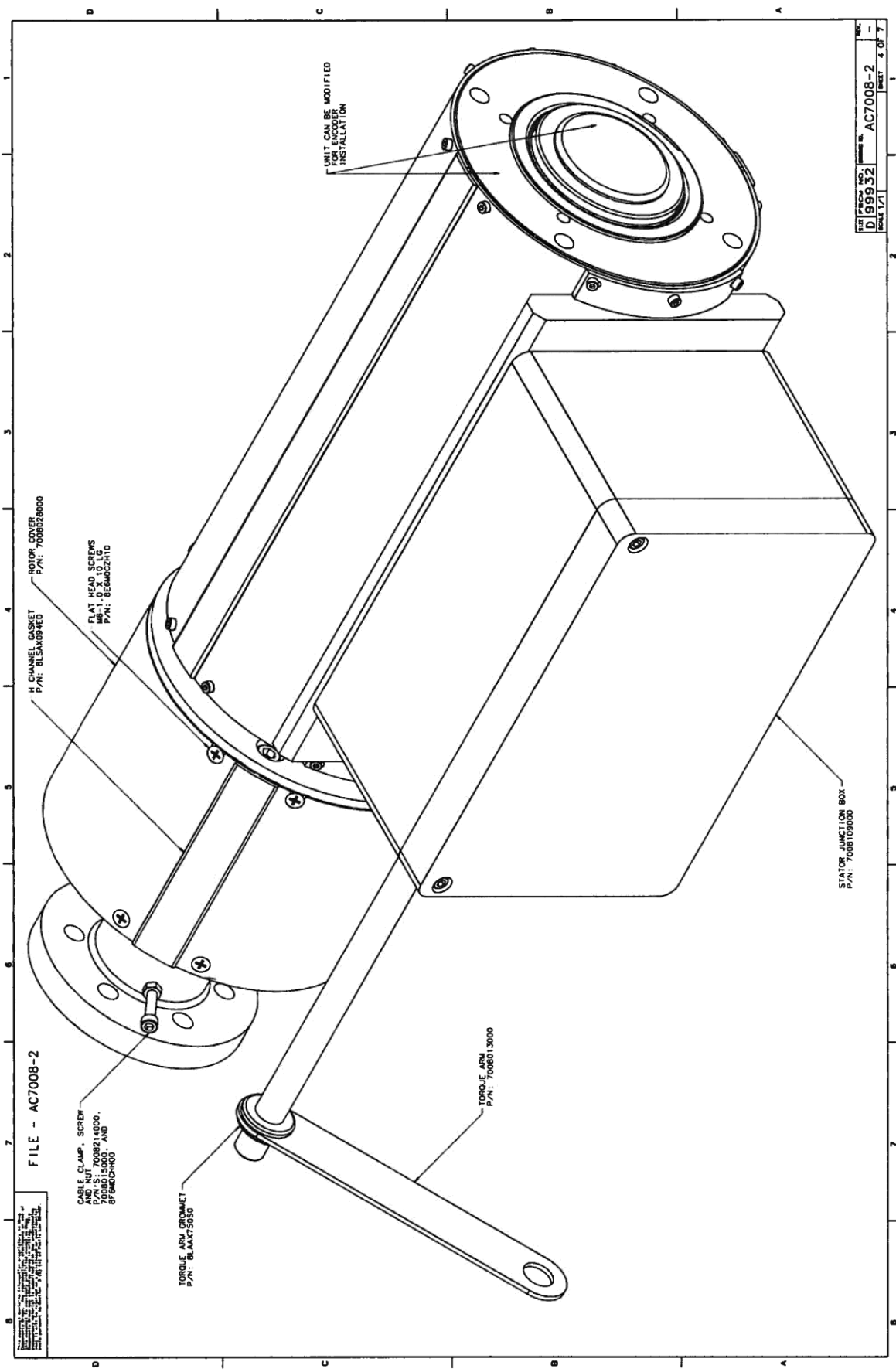
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HEATER

PI-100 (RTD)

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