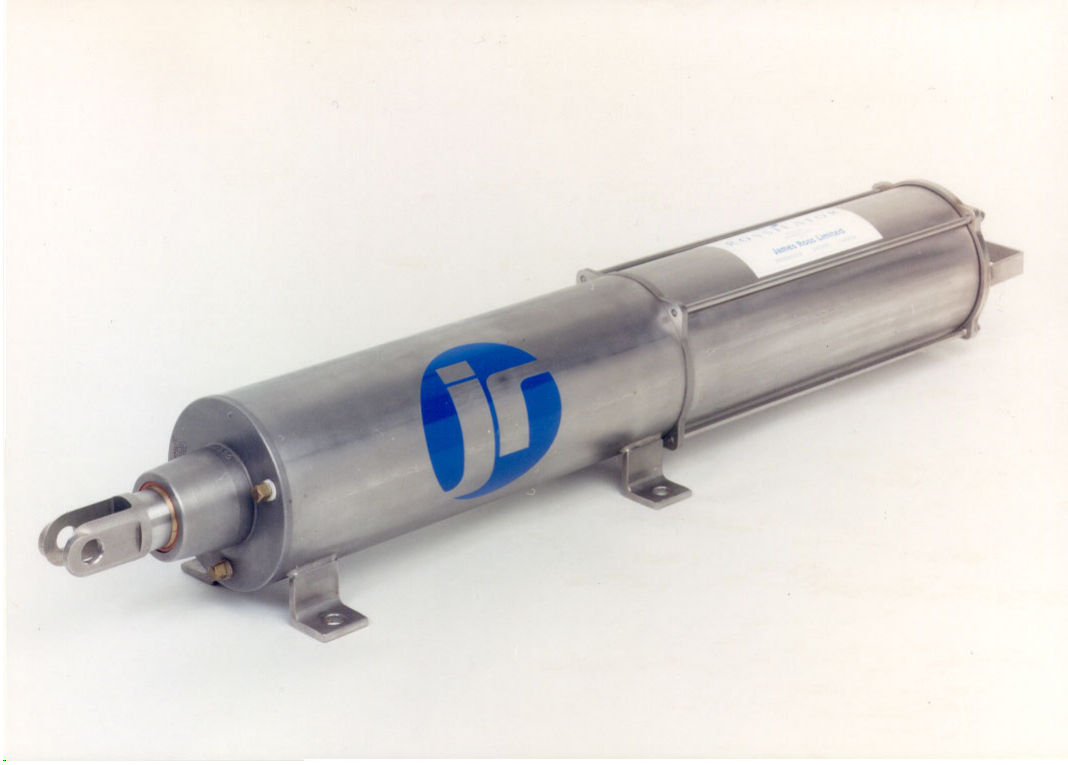
James Ross

ROSSILATOR™ – MANUAL

RSxxxxA Series

JR – STD – HD / Junior – Standard – Heavy Duty

V4.2, July 2006



INSTALLATION AND MAINTENANCE INSTRUCTIONS

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1 General Rossilator Information

The Rossilator is an electromechanical shower Oscillator originally developed by James Ross several years ago. About every 5 years the Rossilator has *undergone* major *improvement and upgrades*. Still up until today the Rossilator has the reputation of a low cost and reliable shower oscillator. Based on repair history and customer experience the expected life span of a Rossilator is 7 to 10 years, depending on the environment and quality of installation

Over the years several thousand Rossilators have been put in operation worldwide. There are various types of **Rossilators available, Junior, Standard, Heave Duty, Hi Temp and 18" and 36" Versions**.

On the outside the Rossilator still looks the same as originally designed and manufactured, mainly to accommodate existing mounting patterns and footprints for easy swap with old worn out units. Big steps in Rossilator upgrades can be recognized by the serial number revisions. Serial numbers can be found on the end cover plate or the front cover plate.

Most significant upgrades recognized by the serial number change:

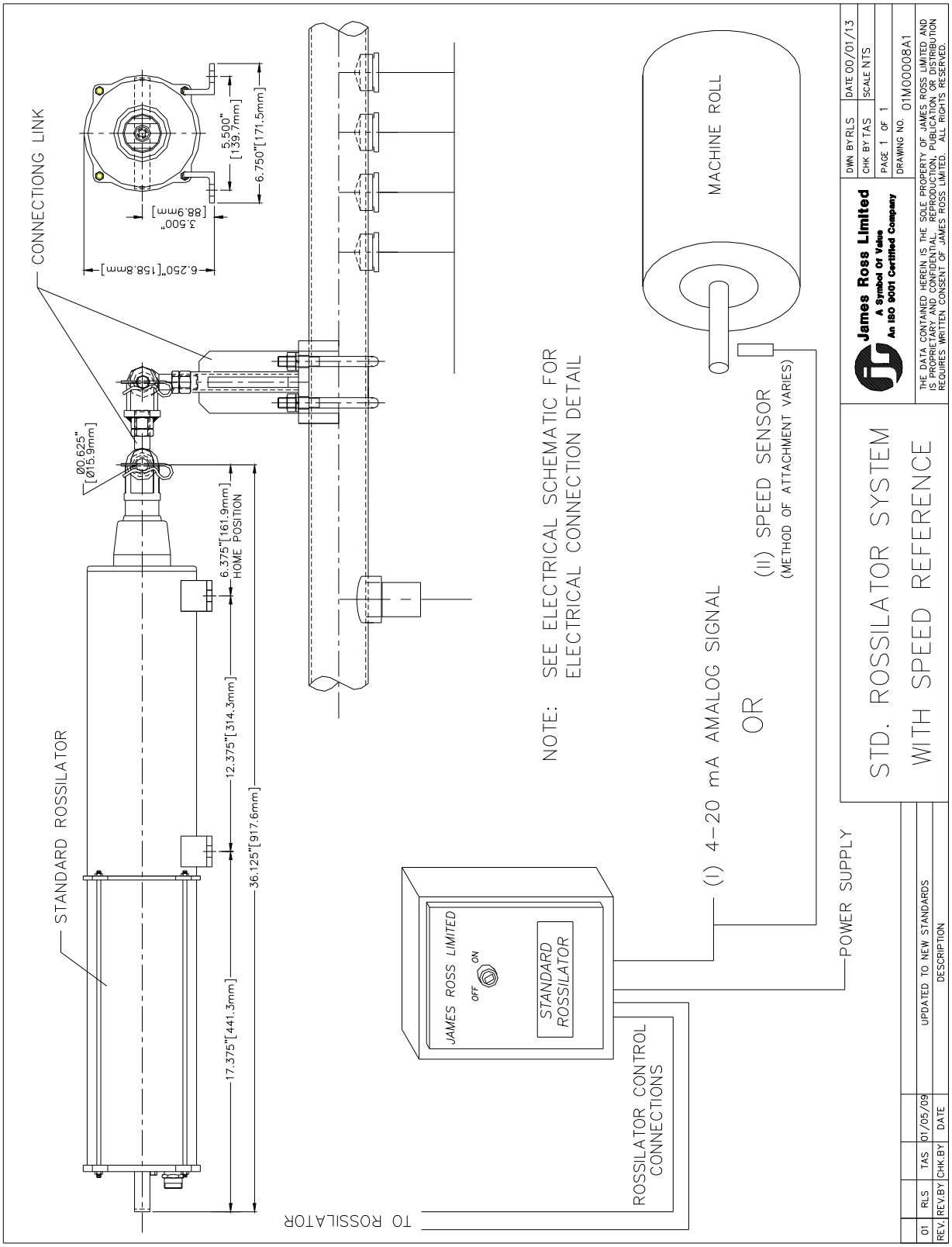
- 1990: *8000* Series had been upgraded
- 1996: *RSxxxx* Series had been introduced
- 2002: ***RSxxxxA*** Serial Number was introduced. The letter "*A*" at the end the serial number is related to the **most current model**. Each and every part of the Rossilator, from the motors to the simple items like bolts, had been going through design changes and modifications.

End cover with Serial Number

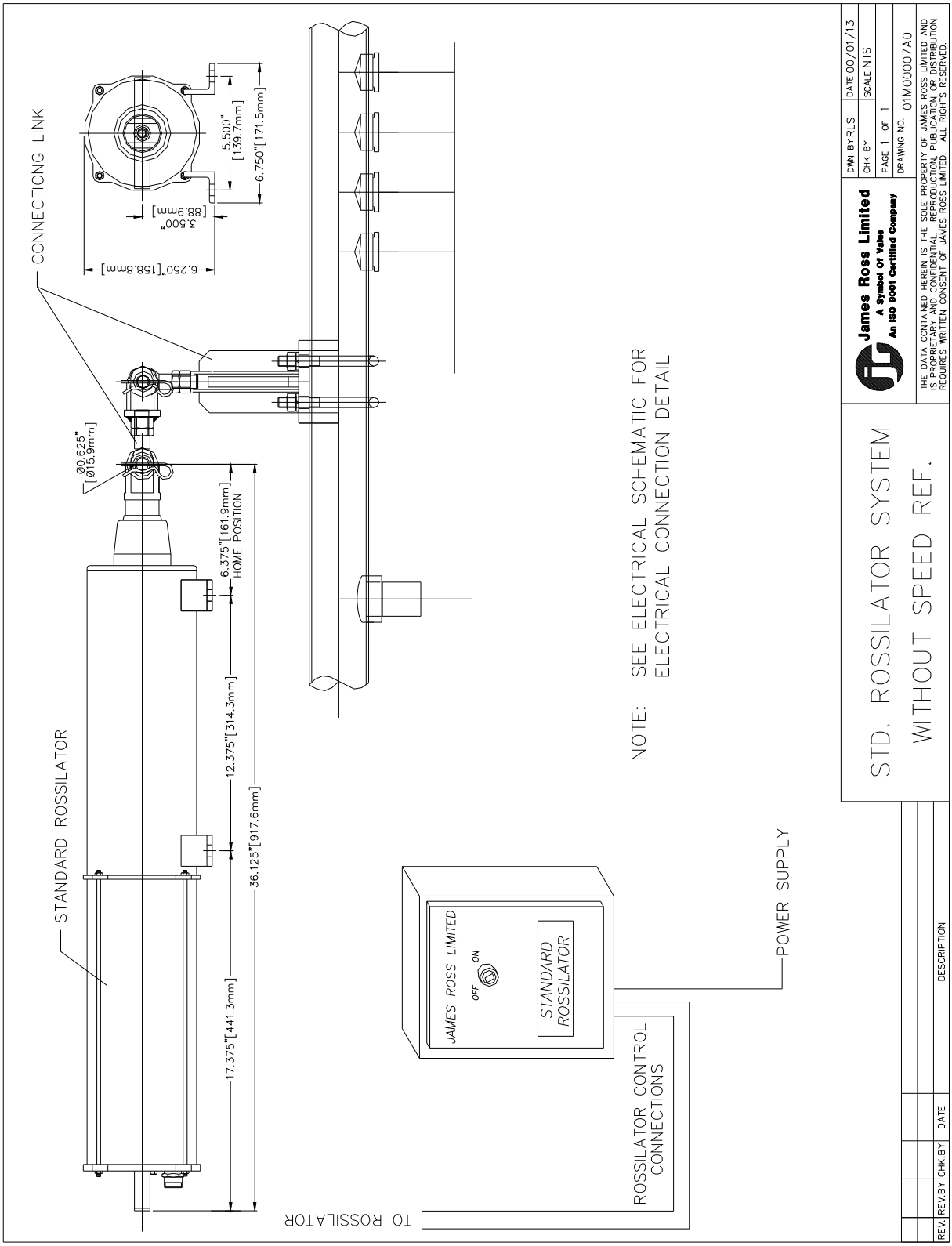
Manuals for old Rossilators can still be obtained from James Ross Limited. (Contact information pls. find on last page of this manual)

2 System Drawings

2.1 with speed reference (see also chapter 4.2)

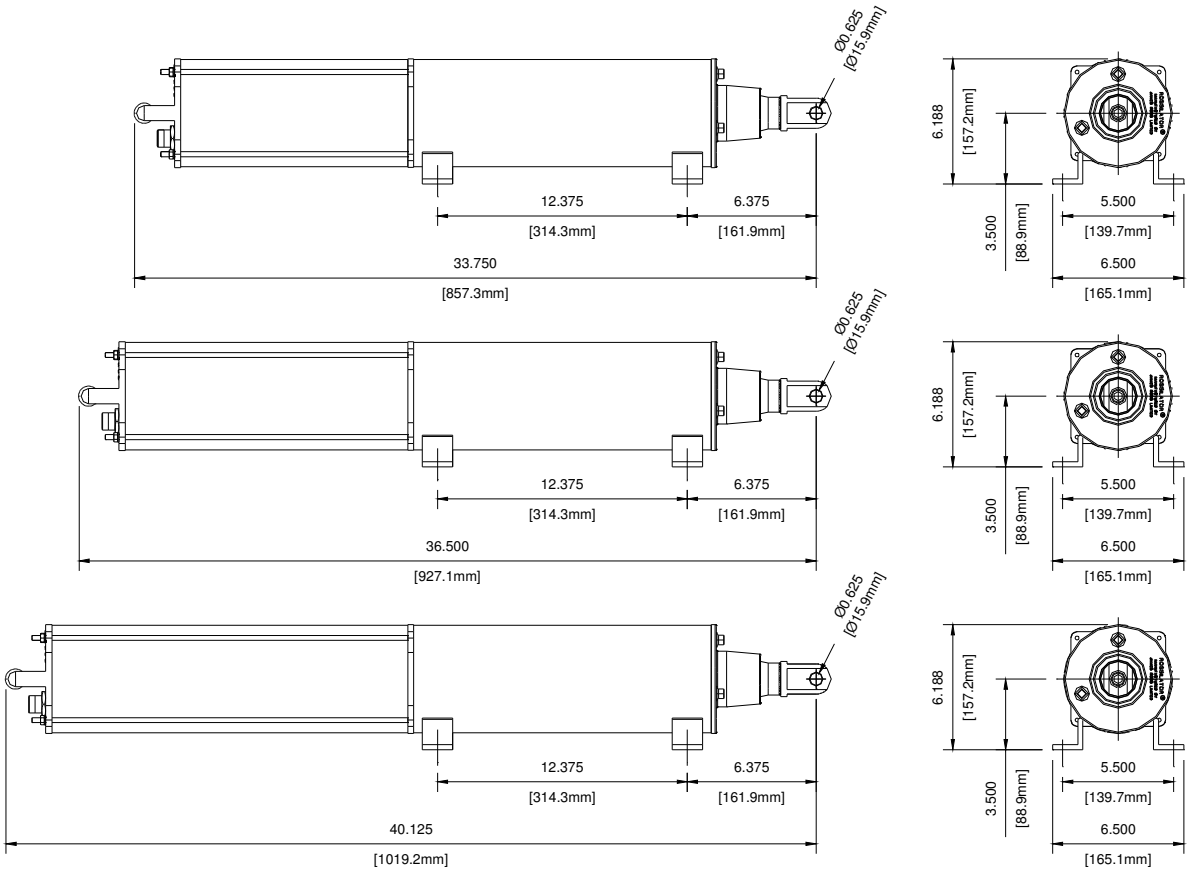


2.2 without speed reference (see also chapter 4.2)



3 Rossilator Specifications / JR – STD - HD

	Showered Surface	Nominal Thrust	Max. Temp.	Motor Size	Overall Dimensions	Weight
Junior Rossilator	Up to 150” 3810mm	250lbs 1.13kN	150 F 65℃	18.6W	6.75” X 6.25” X 32.75” 171mmX159mmX832mm	48lbs 21.8kg
Standard Rossilator	Up to 250” 6350mm	424lbs 1.89kN	150 F 65℃	31.3W	6.75” X 6.25” X 36.125” 171mmX159mmX918mm	52lbs 23.6kg
Heavy Duty Rossilator	Over 250” 6350mm	1215 lbs 5.40kN	150 F 65℃	31.3W	6.75” X 6.25” X 39.75” 171mmX159mmX1010mm	55lbs 24.9kg
High Temp. Standard Rossilator	Up to 250” 6350mm	424lbs 1.89kN	275 F 135℃	31.3W	6.75” X 6.25” X 36.125” 171mmX159mmX918mm	52lbs 23.6kg
High Temp Heavy Duty Rossilator	Over 250” 6350mm	1215 lbs 5.40kN	275 F 135℃	31.3W	6.75” X 6.25” X 39.75” 171mmX159mmX1010mm	55lbs 24.9kg



	Motor Speed 50Hz	Motor Speed 60Hz	Gear Box Ratio	Screw Lead	Advance per Rev.	Min. Step	Time for one Step 50Hz	Time for one Step 60Hz
Junior Rossilator	60 RPM	72 RPM	N/A	0.100" [2.5mm]	0.100" [2.5mm]	0.020" [0.5mm]	0.41 sec.	0.34 sec.
Standard Rossilator	60 RPM	72 RPM	N/A	0.200" [5.1mm]	0.200" [5.1mm]	0.040" [1.0mm]	0.20 sec.	0.17 sec.
Heavy Duty Rossilator	60 RPM	72 RPM	1:3	0.200" [5.1mm]	0.200" [5.1mm]	0.040" [1.0mm]	0.61 sec.	0.51 sec.

3.1 Specifications common to all models:

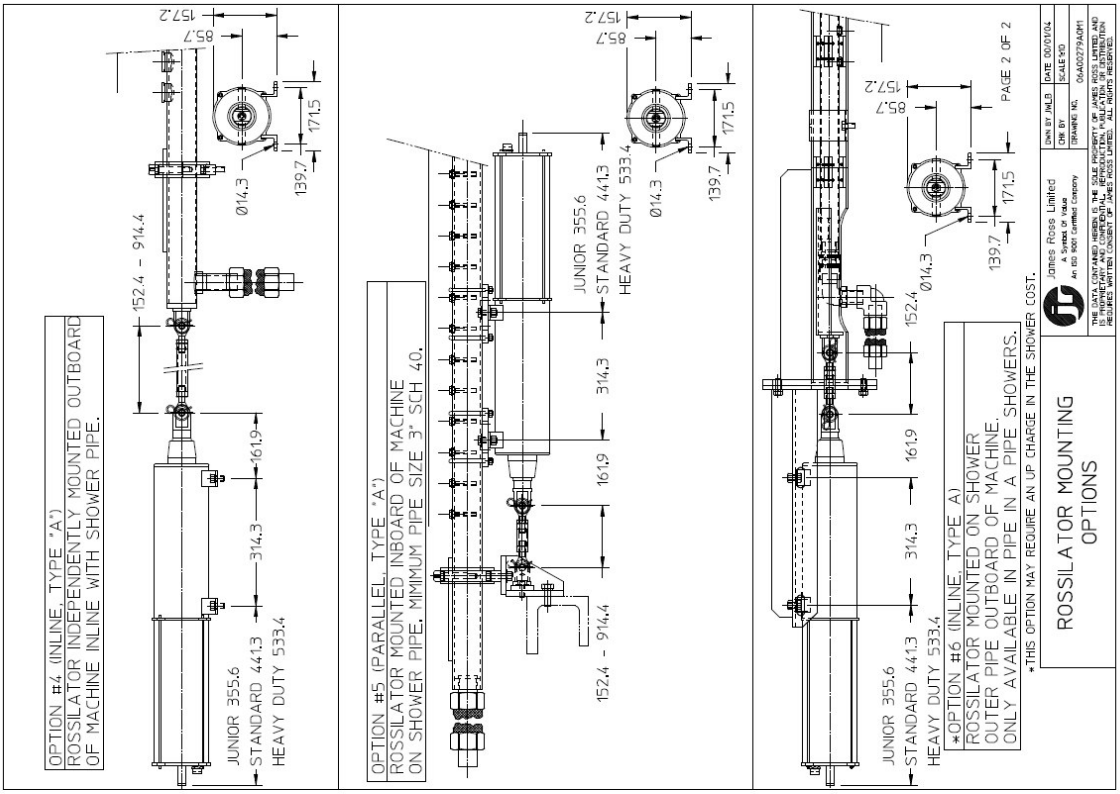
- Mounting Bolt Pattern: 5.5" X 12.375" [139.7mm X 314.3mm]
- Four ½" UNC or M12 mounting bolts.
- Possible stroke length of 0.04" – 12" [1mm – 305mm].
- Step Increment 1mm, 0.04"
- Rossilator motor voltage is 120 VAC single phase, 1 AMP (max)
- Two Sensors: 24 VDC or 120 VAC, inductive proximity sensors

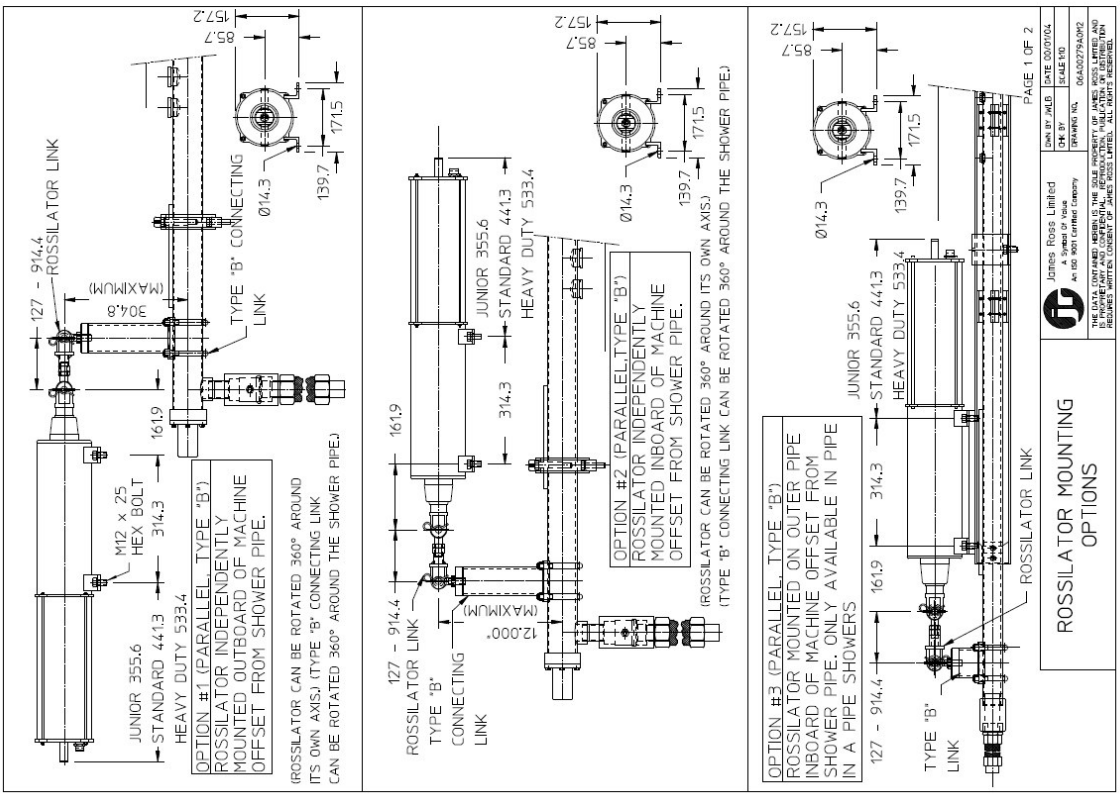
- Universal options to connect Rossilator to shower.
- Can be controlled by PCB (printed circuit board), PLC or machine DCS.

3.1.1 Printed Circuit Board (details see PCB Manual)

Dimensions	4.5" x 8" (114 x 203)
Power Supply	120 vac, 5 amps (Typical amps)
Frequency	60 or 50 HZ
Temperature Ambient	100° F (38° C)
Humidity	90%
Watts	600 watts (120 typical)
Inputs	120 vac
Motor Output	120 vac (Triac)
Status Output	Dry Contact
Water Control Output	Dry Contact
Felt Extender Output	Dry Contact

3.2 Common Rossilator Mounting Options





4 Inspection before Installation

Before installing your new ROSSILATOR™ carefully inspect all components for any shipping damage.

Check ROSSILATOR™ unit for:

- bent clevis or tie rods
- dented housing
- loose or damaged control cables
- damaged connecting link
- bent clevis
- proper voltage and sensor type

Check control panel for:

- dents
- damaged switches
- loose wires

If damage has occurred in transit, report this immediately to the carrier and please contact your JAMES ROSS LIMITED representative or JAMES ROSS LIMITED Customer Service directly for instructions.

NOTE: If your ROSSILATOR has been purchased as a spare or replacement unit, the nameplate at the rear of the ROSSILATOR should be checked for sensor voltage and type to ensure compatibility with existing control equipment.

PLEASE DO NOT SHIP ROSSILATORS BACK TO JAMES ROSS WITHOUT CONSULTATION.

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5 The Rossilator System

Normally, Rossilator oscillation step distance is approximately equal to the shower nozzle orifice.

Step distance can be adjusted as a multiple of minimum step distance with any control option.

The Rossilator is normally stepped for every revolution of the fabric/felt to provide even cleaning.

5.1 Components

5.1.1 External Speed Sensor:

Used to monitor machine speed. The speed sensor is connected to the paper machine on any easily accessible motor, machine roll or drive shaft. The maximum frequency to the ROSSILATOR system is 1500 cycles per second. (Optional)

5.1.2 Rossilator Controls:

Operation of the ROSSILATOR™ is controlled by a small PLC or PCB housed in a Nema 4 enclosure. It is used to control ROSSILATOR™ forward and reverse movement, stroke length, motion detection, no motion alarm, water solenoid operation and customer status signal.

5.1.3 Oscillator

This is the working part of the ROSSILATOR system, a cylindrical unit constructed entirely on the outside of 316L stainless steel, sealed against outside contaminants. Enclosed within the stainless steel housing is an AC synchronous motor, home and motion sensors and an ACME screw. Extending through the forward end of the housing is the stainless steel thrust tube that transmits the ROSSILATORS movement to the shower.

5.1.4 Cables

The Rossilator is supplied with two CSA/UL/VDE approved cables and receptacles that incorporate a keyway to prevent incorrect mating of the cable plug and receptacle. Care should be exercised in ensuring proper orientation and not forcing the connection of the plug and receptacle. The cable is “not for interrupting current.” The electrical supply to the Rossilator must be off prior to removal or installation of the cables to the oscillator receptacles. The cables should not be connected or disconnected under load.

5.1.5 Program Changes

To modify a PLC program a hand held programming console is required. Should it become necessary to change the program, contact JAMES ROSS LIMITED - Technical Department for assistance.

5.2 The Rossilator Operation

5.2.1 Rossilator Operation: (with speed reference – external pulse, see also chapter 1)

To enable this mode, the “INT” jumper must be removed (if using a PLC).

If a PCB is used, select “Pulses” as the Timing Mode via pushbuttons and the LCD display on the PCB. Refer to Electrical Schematics supplied with order.

The speed sensor (supplied separately from the ROSSILATOR™ for speed sensing) is connected to the paper machine to produce pulses in a direct ratio to the speed of the felt or fabric. The signal from the speed sensor is fed to the PLC or PCB mounted in the control panel. A counter in the PLC or PCB counts the pulses and, at a preset value, energizes the ROSSILATOR™ for a brief period. The motor rotates and advances the thrust tube, clevis and shower pipe one increment of the total stroke. The operation is repeated until the PLC or PCB reaches the preset value of the required stroke. Once the preset value of stroke is reached the PLC or PCB will set the ROSSILATOR™ in the reverse mode.

The thrust tube retracts exactly the same as in the forward mode until the home sensor signals the PLC or PCB to activate the forward mode.

The function of the motion sensor in the ROSSILATOR™ is to act as a motion monitor for the PLC or PCB. Terminals are provided in the control panel to activate a solenoid valve (Mill Supplied) in the shower water supply line and to cut off the water supply in the event of a machine or ROSSILATOR™ failure.

An interlock input (customer interlock) is available to remotely start and stop the ROSSILATOR™ should the showered surface (fabric, felt, and roll) either start or stop moving. The OFF/ON selector switch on the face of the enclosure must be in the ON position to incorporate this feature. Should the interlock input not be used, then a jumper must be placed at this location (see control panel wiring drawing supplied).

ROSSILATOR OPERATION: (WITH SPEED REFERENCE - 4 TO 20 mA ANALOG SIGNAL)
To enable this mode, the “INT” jumper must be removed (if using a PLC complete with an analog input card). If a PCB is used, select “Analog” as the Timing Mode via pushbuttons and the LCD display on the PCB. Refer to Electrical Schematics supplied with order.

The 4 to 20 mA signal is fed to the PLC analog input card of the PCB which is mounted in the control panel. The analog current level is detected and based on that level will cause the ROSSILATOR™ to make one increment of the total stroke corresponding to one revolution of the fabric being showered. The operation is repeated until the PLC or PCB reaches the preset value of the required stroke. Once the preset value of stroke is reached the PLC or PCB will set the ROSSILATOR™ in the reverse mode.

The thrust tube retracts exactly the same as in the forward mode until the home sensor signals the PLC or PCB to activate the forward mode.

5.2.2 Rossilator Operation: (without speed ref. – internal pulse, see also chapter 1)

To enable this mode, the “INT” jumper must be inserted when using a PLC. When using a PCB, select “Internal” as the Timing Mode via pushbuttons and the LCD display on the PCB. Refer to Electrical Schematics supplied with order.

If the machine speed is constant a speed sensor is not required. A preset value for an internal timer is determined by calculating the average machine speed and the average speed of the felt or fabric. When the preset value is reached the ROSSILATOR™ is energized for a brief period and the ROSSILATOR operates exactly as described on the previous page. The only difference being that the motion sensor will only cut off the water supply in the event of a ROSSILATOR™ failure due to the fact that without a speed sensor the PLC or PCB does not detect actual machine speed.

If the paper machine should stop, an operator would have to turn the selector switch to the OFF position on the control panel to stop the ROSSILATOR™ and cut off the water supply, or if the “customer interlock” is connected to the PLC or PCB, then it will stop the ROSSILATOR™

5.2.3 PCB Start-Up Settings

Prior to putting the ROSSILATOR™ into service, presets are inputted into the PCB via the pushbuttons and LCD display on printed circuit board (PCB). The following presets must be entered by the customer:

- Model (“Standard” or “Junior” or “Heavy Duty”)
- Timing Mode (“Internal” or “Pulses” or “Analog”)
- Units (“Inch” or “mm”)
- Stroke ([0.04" to 12.24"] or [1 mm to 314 mm])
- Dwell (“time for Internal Mode” or “# of pulses for Pulse Mode” or “fabric length & machine speed for Analog Mode”)
- Attack Angle (“# of stokes for Penetrating” or “# of strokes for Chiseling”).

NOTE:
Attack Angle is used only if the shower is outfitted with a variable angle Felt Extender device.
Refer to electrical schematic provided with your equipment for detailed PCB preset procedure.

The ROSSILATOR™ will return to the “home” position on power up or shutdown.

The customer status normally open (N.O.) relay contact is closed (energized) during normal operation.
The water valve control (N.O.) relay contact is closed (energized) when operating.

The status lamp is
- “OFF” when not operating
- “ON” when the system is operating
- “flashing” when a fault is present

All inputs and outputs have an LED on the printed circuit board (PCB) to indicate status.
Additionally, input and output status as well as position and alarm conditions are displayed on the LCD display.

6 Rossilator Installation

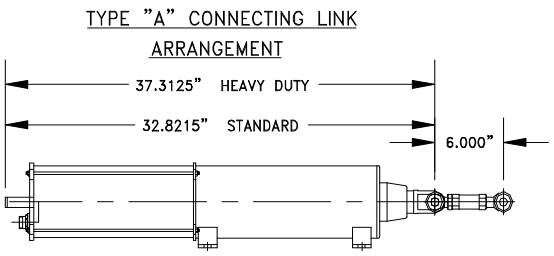
1. Install the ROSSILATOR™ unit on the mounting bracket.

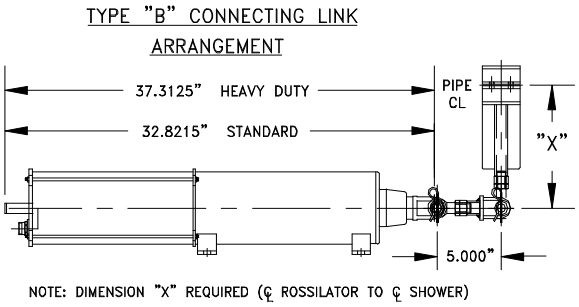
2. Check shower pipe for free movement. The shower pipe must move freely in its bearings.

3. Ensure that the centre line of the ROSSILATOR™ is parallel to the centre line of the shower. See oscillation alignment/installation procedure Page 12.

4. Ensure there is no obstruction for a full stroke of shower.

5. Connect the ROSSILATOR™ to the shower with the appropriate connecting link supplied by JAMES ROSS LIMITED. There are two types of connecting links available, Type A for inline connections and Type B for offset connections (see sketches below). Both Type A and Type B connecting links have double ended spherical rod ends to help eliminate any misalignment between the ROSSILATOR™ and the shower.





NOTE:
It is imperative that these links be installed; failure to do so will result in the voiding of the guarantee. Rigid or slotted link connections are disallowed.

6. Mount speed sensor on bracket (if required) and couple to the roll (by customer).

7. Mount control panel in any convenient dry location, preferably in an MCC room. Run ROSSILATOR™ control cables to the control panel and make the connections to the terminal blocks in the control panel. Run wires (MUST BE SHIELDED CABLE) from the proximity switch to panel and make the connections to the terminal blocks in the control panel. For control panel terminal block connections see the drawings supplied with equipment. If the ROSSILATOR control cables are run to a junction box, water tight fittings MUST BE USED. The cables running from the junction box to the control panel MUST BE SEPARATE and the 24 VDC cables, when applicable, should be shielded. Failure to do so may result in incorrect operation of the PLC. The maximum total cable distance is 330' (100m).

8. Run power supply to control panel (120 VAC) and make connections to the terminal blocks in the control panel.

6.1 Alignment and installation procedure

After the Shower has been checked for square, parallelism and freedom of movement, the oscillator may be installed.

Place the unit into position and install the four (4) mounting bolts, to a point where the unit is held in position, but alignment movement is still possible.

Use a straight edge lying along the top of the screw housing. Take two (2) measurements one at the closest measurable point on the Shower and one at the furthest measurable point of the Shower. These measurements should be identical. If not, steps must be taken such as shimming to bring the unit into alignment.

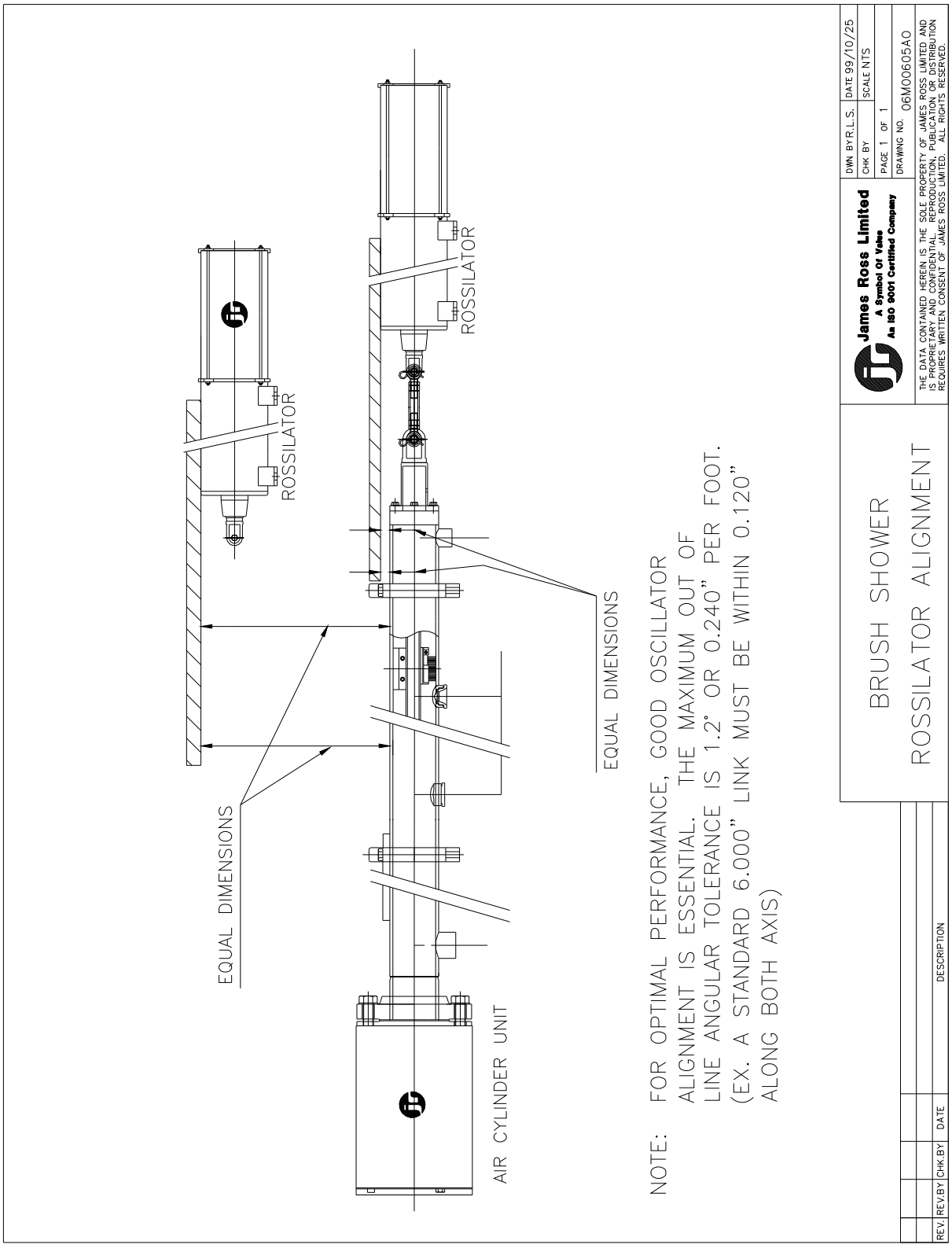
For side alignment, take the same measurement as in Step #3 at 90° from the top of the oscillator and true up accordingly. Tighten the mounting bolts.

Install connecting link. If using a type AB@ connecting link assembly, care should be taken to ensure it is installed squarely.

NOTE:
For steps #3 and #4, if bearing housings or the machine frame create interference problems, two straight edges may be used in unison, one on the oscillator, and one on the Shower.

For optimal performance, good oscillator alignment is essential. The maximum out of line angular tolerance is 1.2° or .24" per foot.

SEE INSTALLATION SKETCH NUMBER 06M00605A0



ROSSILATOR Alignment Sketch **06M00605A0**

7 Rossilator Maintenance

Any problems encountered with any of the ROSSILATOR™ family should be reported to JAMES ROSS LIMITED. The serial number should be determined beforehand to enable us to better help you. The serial number is stamped on the front housing of the ROSSILATOR™.

7.1 Rebuilding Service at James Ross

James Ross Limited provides rebuilding services for all its oscillation systems. Our rebuilds repair the unit and upgrade it to current design standards. All oscillators rebuilt by James Ross Limited are fully warranted for 12 months from date of installation or 18 months from date of supply. Contact your James Ross Limited representative for further information.

7.2 Rossilator disassembly procedure

1. Remove the four 1/4" hex nuts (item 69) from the ROSSILATOR™ motor end cover (item 09).
2. Remove the motor end cover (item 09)
3. Disconnect control cable receptacle terminals (item 71, 72)
4. Remove motor housing (item 10) from the motor mount (item 07)
5. Unscrew the tie rods (item 11) from the motor mount (item 07)
6. Loosen the four set screws in the shaft coupling (item 63)
7. Remove the #10-32 hex head cap screws (item 64) from the motor mount (item 07)
8. Remove motor (item 67) from the motor mount (item 07)
9. Unscrew motion sensor (item 62) and home sensor (item 61) from the motor mount (item 07)
10. Loosen the two set screws from the motion target assembly (item 08) and remove
11. Remove the 1/2" socket head cap screw (item 50) from the clevis (item 01)
12. Unscrew the main drive screw (item 06) so that the thrust tube (item 02) is fully extended.
13. Remove the two 5/16" hex head machine screws (item 54) from the motor mount (item 07) and finish unscrewing the main drive screw (item 06)
14. Remove the thrust tube (item 02) by sliding it through the thrust end plate (item 03)
15. Remove the circlip (item 55) that holds the main drive screw to the motor mount (item 07)
16. Unscrew the two guide rods (item 05) from the thrust end plate (item 03)
17. Using a scribe, insert it between the back of the brass scraper seal and the thrust end plate (item 03.1) and pry out the silicone cushion ring, allowing removal of brass scraper seals.

18. Remove the circlip (item 03.51) from the thrust end plate (item 03.1).

19. Using the same procedure as in step 17, remove the two inner seals (item 03.50) and the two bushings from the thrust end plate (item 03.1).

NOTE:
When replacing the inner thrust end plate seals (item 03.50) care must be taken that they are installed back to back with the spacer placed between them.

7.3 Sensor Removal and replacement procedure

The ROSSILATOR™ s designed to operate in an extremely harsh environment and requires minimal maintenance.

Should it become necessary to change the stroke or any of the other ROSSILATOR program settings, please contact the JAMES ROSS LIMITED Technical Department.

The following procedure should be followed when changing sensors. Please follow these instructions carefully.

1. Ensure that the ROSSILATOR is in the home position (fully retracted).

2. Remove the four (4) tie rod nuts (item 69) from the motor end cover (item 09).

3. Remove the motor end cover (item 09) from the tie rods (item 11). All wire connections from the control cables to the motor, home (item 61) and motion sensors (item 62) will now be visible.

4. For steps 5 through 8 refer to the electrical drawing provided with the equipment.

5. Disconnect the two green ground wires from the motor ground stud.

6. Disconnect motor (item 67) wires.

7. Disconnect home sensor (item 61) wires.

8. Disconnect motion sensor (item 62) wires.

9. Set aside the motor end cover (item 09) and control cables.

10. Remove the motor housing (item 10) and set aside.

11. The motor and sensors will now be completely exposed.

12. Remove the home sensor (item 61). **NOTE:** The home sensor is the sensor on the upper right hand side looking from the motor to the oscillating mechanism.

13. Screw the replacement home sensor (item 61) in until it bottoms out.
14. Back the home sensor (item 61 off one-half turn. This ensures the correct sensor distance. If the sensor is backed off more than one-half turn it will not operate.

15. Tighten down the locknut on the home sensor (item 61), using caution as to not damage sensor.

16. Remove the motion sensor (item 62) from its mounting bracket. It is the sensor on the right hand side that does not penetrate the body of the drive unit.

17. Screw the new motion sensor (item 62) into its mounting bracket until it bottoms out on the motion target (item 19).

18. Back the motion sensor off one full turn, and tighten down the locknut on the motion sensor, using caution as to not damage the sensor.

19. Run the home (item 61) and motion sensor (item 62) wires to the back of the motor.

20. Remove and replace the motor mount O-Ring (item 66).

21. Replace the motor housing (item 10).

22. Retrieve the motor end cover (item 09) and control cables.

23. For step 24 refer to electrical drawing provided with your equipment.

24. Repeat steps 5,6,7 and 8 connecting the wires.

25. Check all wire connections to ensure they are correct. If one connection is wrong the ROSSILATOR will not operate. (Ensure all wire connections are tight)

26. Place the motor end cover (item 09) in position over the tie rods (item 11). Make sure the motor end cover o-ring (item 66) is seated properly between the motor end cover (item 09) and the motor housing (item 10).

27. Replace tie rods (item 11) and tighten down, making sure the motor end cover (item 09) is correctly positioned on the tie rods (item 11) and the motor cover (item 10).

7.4 Lubrication

The ROSSILATOR is shipped with the proper amount of grease and oil. Should it become necessary to replace the lubricant, only 425 degrees F waterproof ***molyslip M.P.G. grease*** and ***Petro Canada Senate 1000 oil*** should be used. Optional oil can be ***Shell Omala 1000***.

Fill Amount: 9 oz. or 250ml into the screw housing

The ROSSILATOR™ grease and oil should be checked every two years. No substitute for the specified grease is recommended. This grease and oil may be obtained from JAMES ROSS LIMITED.

8 Rossilator Spare Parts

8.1 Recommended Spare Parts for all Rossilator types

While the ROSSILATOR™ is virtually maintenance free if operating under normal wet end conditions, the following spare parts may be ordered at the discretion of the user. Please have the Rossilator Serial number available when ordering spares.

- AC stepping motor (brushless)
- ACME screw
- Lock washer
- Screw bearing
- O-Ring
- Thrust tube assembly with nut housing,
- tube, bronze nut and tube plug
- Thrust tube bushings (2 piece)

- Thrust tube seals (2 required)
- Wiper Seal
- Clevis

- Home and Motion sensor
  - 120 VAC
  - 24 VDC PNP
  - 24 VDC NPN

- 4 - conductor Cable (Female)
- 5 - Conductor Cable (Female)
- 4 - Conductor Receptacle (Male)
- 5 - Conductor Receptacle (Male)

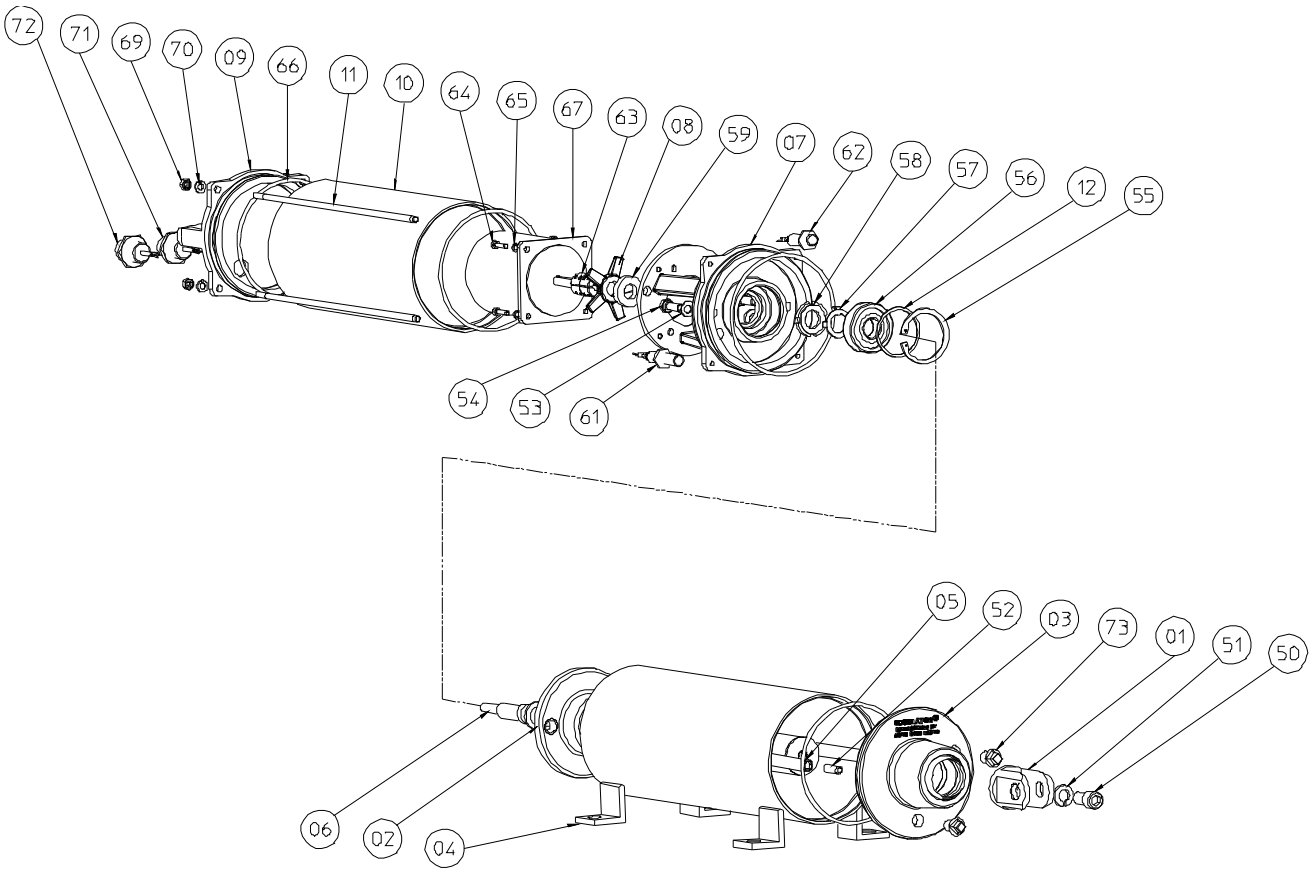
- CONTROL PANEL SPARES
  - Capacitor
  - Resistor (3 required)

- PCB CONTROL SPARES
  - PCB
  - Fuses
    - 1/8 AMP
    - 2 AMP

8.2 HIGH TEMP Versions – Specific Spare Parts

- Motor
- End Covers
- Seals
- Proximity Sensor
- Cord Grip Connector
- Cable

8.3 Rossilator – Exploded View



(Junior Rossilator Shown, Standard and HD Similar)

8.4 JUNIOR Rossilator – Spare Parts List

Item	Qty.	Description	Part Number
01	1	Standard Clevis	704-00008
02	1	Thrust Tube Assembly	800-00001
03	1	Thrust Tube End Plate Bushing Assembly	804-00010
04	1	Screw Housing Assembly	804-00016
05	2	Guide Rod	704-00015
06	1	Rossilator Screw (Junior)	804-00014
07	1	Motor Mount Assembly	804-00015
08	1	Motion Target Assembly	800-00321
09	1	Motor End Cover	700-00159
10	1	Junior Motor Housing	700-00161
11	4	Tie Rod (Junior)	700-00160
12	1	Screw Bearing Spacer	700-00128
50	1	Socket Head Cap Screw ½" UNF X 1"	106-10015
51	1	½" Lock Washer	104-20008
52	2	5/16" UNF X 1" Stud	110-00025
53	2	5/16" Sealing Washer	104-60001
54	2	5/16" UNC X 1 ½" Hex Bolt	102-10051
55	1	Retaining Ring (Circlip)	319-00036
56	1	2.047" OD X 0.787" ID Screw Bearing	317-00001
57	1	MB4 Bearing Lock Washer	112-00001
58	1	KM4 Bearing Lock Nut	112-00002
59	1	Screw Seal	320-10012
61	1	Home Sensor – See Options Below	
62	1	Motion Sensor – See Options Below	
		Proximity Sensor, 24VDC PNP	588-00190
		Proximity Sensor, 24VDC NPN	588-00180
		Proximity Sensor, 120VAC	588-00160
63	1	Ø3/8" X Ø3/8" Socket Coupling	319-10002
64	4	#10-32 X ¾" Socket Head Screw	106-10018
65	4	#10 Lock Washer	104-20012
66	4	#351 O-Ring – See Options Below	
		Standard O-Ring	320-20001
		High Temperature O-Ring	320-30002
67	1	Motor – See Options Below	
		Motor, 420 Oz/In, Ø3/8" Shaft, 120 VAC	534-00030
		Motor, 420 Oz/In, Ø3/8" Shaft, 240 VAC	534-00080
68	1	Capacitor 14 microFarad, 250V, 60Hz	504-00060
69	4	¼" UNC Hex Nut	103-00001
70	4	¼" Lock Washer	104-20003
71	1	5 Conductor Male Receptacle	590-00040
72	1	4 Conductor Male Receptacle	590-00020
73	2	¼" NPT Square Head Plug	105-00014
77	1	4 Pin Female Cable, 12 feet (not shown)	502-00010
78	1	5 Pin Female Cable, 12 feet (not shown)	502-00050

8.5 STANDARD Rossilator - Spare Part list

Item	Qty.	Description	Part Number
01	1	Standard Clevis	704-00008
02	1	Thrust Tube Assembly	804-00001
03	1	Thrust Tube End Plate Assembly	804-00010
04	1	Screw Housing Assembly	804-00016
05	2	Guide Rod	704-00015
06	1	Rossilator Screw	704-00012
07	1	Motor Mount Assembly	804-00015
08	1	Motion Target Assembly	800-00321
09	1	Motor End Cover	700-00159
10	1	Standard Motor Housing	704-00040
11	4	Tie Rod (Standard)	704-00133
12	1	Screw Bearing Spacer	700-00128
50	1	Socket Head Cap Screw ½" UNF X 1"	106-10015
51	1	½" Lock Washer	104-20008
52	2	5/16" UNF X 1" Stud	110-00025
53	2	5/16" Sealing Washer	104-60001
54	2	5/16" UNC X 1 ½" Hex Bolt	102-10051
55	1	Retaining Ring (Circlip)	319-00036
56	1	2.047" OD X 0.787" ID Screw Bearing	317-00001
57	1	MB4 Bearing Lock Washer	112-00001
58	1	KM4 Bearing Lock Nut	112-00002
59	1	Screw Seal	320-10012
61	1	Home Sensor – See Options Below	
		Proximity Sensor, 24VDC PNP	588-00190
		Proximity Sensor, 24VDC NPN	588-00180
		Proximity Sensor, 120VAC	588-00160
62	1	Motion Sensor – See Options Below	
		Proximity Sensor, 24VDC PNP	588-00190
		Proximity Sensor, 24VDC NPN	588-00180
		Proximity Sensor, 120VAC	588-00160
63	1	Ø5/8" X Ø1/2" Socket Coupling	319-10001
64	3	#10-32 X 5/8" Socket Head Screw	106-00050
65	3	#10 Lock Washer	104-30013
66	4	Standard #351 O-Ring	320-20001
67	1	Motor – See Options Below	
		Motor, 700 Oz/In, Ø1/2" Shaft, 120 VAC	534-00042
		Motor, 700 Oz/In, Ø1/2" Shaft, 240 VAC	534-00077
69	4	¼" UNC Hex Nut	103-00001
70	4	¼" Lock Washer	104-20003
71	1	5 Conductor Male Receptacle	590-00040
72	1	4 Conductor Male Receptacle	590-00020
73	2	¼" NPT Square Head Plug	105-00014
77	1	4 Pin Female Cable, 12 feet (not shown)	502-00010
78	1	5 Pin Female Cable, 12 feet (not shown)	502-00050

8.6 STANDARD HIGH TEMP Rossilator – Spare Parts List

Item	Qty.	Description	Part Number
01	1	Standard Clevis	704-00008
02	1	Thrust Tube Assembly	804-00001
03	1	Thrust Tube End Plate Assembly – High Temp	804-00009
04	1	Screw Housing Assembly	804-00016
05	2	Guide Rod	704-00015
06	1	Rossilator Screw	704-00012
07	1	Motor Mount Assembly – High Temp	808-00007
08	1	Motion Target Assembly	800-00321
09	1	Motor End Cover – High Temp	704-00132
10	1	Standard Motor Housing	704-00040
11	4	Tie Rod (Standard)	704-00133
12	1	Screw Bearing Spacer	700-00128
50	1	Socket Head Cap Screw ½" UNF X 1"	106-10015
51	1	½" Lock Washer	104-20008
52	2	5/16" UNF X 1" Stud	110-00025
53	2	5/16" Sealing Washer	104-60001
54	2	5/16" UNC X 1 ½" Hex Bolt	102-10051
55	1	Retaining Ring (Circlip)	319-00036
56	1	2.047" OD X 0.787" ID Screw Bearing	317-00001
57	1	MB4 Bearing Lock Washer	112-00001
58	1	KM4 Bearing Lock Nut	112-00002
59	1	Screw Seal – High Temp	320-00004
61	1	Home Sensor – High Temp	588-00050
62	1	Motion Sensor – High Temp	588-00050
63	1	Ø5/8" X Ø1/2" Socket Coupling	319-10001
64	3	#10-32 X 5/8" Socket Head Screw	106-00050
65	3	#10 Lock Washer	104-30013
66	4	High Temp #351 O-Ring	320-30002
67	1	Motor, 700 Oz/In, Ø1/2" Shaft, 120 VAC, High Temp.	534-00015
69	4	¼" UNC Hex Nut	103-00001
70	4	¼" Lock Washer	104-20003
71	1	SS Cord Grip Connector	508-00500
73	2	¼" NPT Square Head Plug	105-00014
77	1	9 Conductor Cable, 25 feet (not shown)	502-00009

8.7 HEAVY DUTY Rossilator – Spare Parts List

Item	Qty.	Description	Part Number
01	1	Standard Clevis	704-00008
02	1	Thrust Tube Assembly	804-00001
03	1	Thrust Tube End Plate Assembly	804-00010
04	1	Screw Housing Assembly	804-00016
05	2	Guide Rod	704-00015
06	1	Rossilator Screw	704-00012
07	1	Motor Mount Assembly	804-00015
08	1	Motion Target Assembly	800-00321
09	1	Motor End Cover	700-00159
10	1	Motor Housing (HD)	704-00134
11	4	Tie Rod (HD)	704-00135
12	1	Screw Bearing Spacer	700-00128
13	1	3:1 Gear Reducer Assembly	800-00013
50	1	Socket Head Cap Screw ½" UNF X 1"	106-10015
51	1	½" Lock Washer	104-20008
52	2	5/16" UNF X 1" Stud	110-00025
53	2	5/16" Sealing Washer	104-60001
54	2	5/16" UNC X 1 ½" Hex Bolt	102-10051
55	1	Retaining Ring (Circlip)	319-00036
56	1	2.047" OD X 0.787" ID Screw Bearing	317-00001
57	1	MB4 Bearing Lock Washer	112-00001
58	1	KM4 Bearing Lock Nut	112-00002
59	1	Screw Seal	320-10012
61	1	Home Sensor – See Options Below	
		Proximity Sensor, 24VDC PNP	588-00190
		Proximity Sensor, 24VDC NPN	588-00180
		Proximity Sensor, 120VAC	588-00160
62	1	Motion Sensor – See Options Below	
		Proximity Sensor, 24VDC PNP	588-00190
		Proximity Sensor, 24VDC NPN	588-00180
		Proximity Sensor, 120VAC	588-00160
63	1	Ø5/8" X Ø1/2" Socket Coupling	319-10001
64	6	#10-32 X 5/8" Socket Head Screw	106-00050
65	6	#10 Lock Washer	104-30013
66	4	Standard #351 O-Ring	320-20001
67	1	Motor – See Options Below	
		Motor, 700 Oz/In, Ø1/2" Shaft, 120 VAC	534-00042
		Motor, 700 Oz/In, Ø1/2" Shaft, 240 VAC	534-00077
69	4	¼" UNC Hex Nut	103-00001
70	4	¼" Lock Washer	104-20003
71	1	5 Conductor Male Receptacle	590-00040
72	1	4 Conductor Male Receptacle	590-00020
73	2	¼" NPT Square Head Plug	105-00014
77	1	4 Pin Female Cable, 12 feet (not shown)	502-00010
78	1	5 Pin Female Cable, 12 feet (not shown)	502-00050

8.8 HEAVY DUTY HIGH TEMP Rossilator – Spare Parts List

Item	Qty.	Description	Part Number
01	1	Standard Clevis	704-00008
02	1	Thrust Tube Assembly	804-00001
03	1	Thrust Tube End Plate Assembly – High Temp	804-00009
04	1	Screw Housing Assembly	804-00016
05	2	Guide Rod	704-00015
06	1	Rossilator Screw	704-00012
07	1	Motor Mount Assembly – High Temp	808-00007
08	1	Motion Target Assembly	800-00321
09	1	Motor End Cover – High Temp	704-00132
10	1	Motor Housing (HD)	704-00134
11	4	Tie Rod (HD)	704-00135
12	1	Screw Bearing Spacer	700-00128
13	1	3:1 Gear Reducer Assembly	800-00013
50	1	Socket Head Cap Screw ½" UNF X 1"	106-10015
51	1	½" Lock Washer	104-20008
52	2	5/16" UNF X 1" Stud	110-00025
53	2	5/16" Sealing Washer	104-60001
54	2	5/16" UNC X 1 ½" Hex Bolt	102-10051
55	1	Retaining Ring (Circlip)	319-00036
56	1	2.047" OD X 0.787" ID Screw Bearing	317-00001
57	1	MB4 Bearing Lock Washer	112-00001
58	1	KM4 Bearing Lock Nut	112-00002
59	1	Screw Seal – High Temp	320-00004
61	1	Home Sensor – High Temp	588-00050
62	1	Motion Sensor – High Temp	588-00050
63	1	Ø5/8" X Ø1/2" Socket Coupling	319-10001
64	6	#10-32 X 5/8" Socket Head Screw	106-00050
65	6	#10 Lock Washer	104-30013
66	4	High Temperature #351 O-Ring	320-30002
67	1	Motor, 700 Oz/In, Ø1/2" Shaft, 120 VAC, High Temp.	534-00015
69	4	¼" UNC Hex Nut	103-00001
70	4	¼" Lock Washer	104-20003
71	1	SS Cord Grip Connector	508-00500
73	2	¼" NPT Square Head Plug	105-00014
77	1	9 Conductor Cable, 25 feet (not shown)	502-00009

9 Trouble Shooting

9.1 Rossilator does not stroke at all or stops in mid stroke

- Check for any obvious physical restriction of the shower or Rossilator which would prevent movement, especially on inner shower pipe assemblies.
- If using analog speed reference and the machine is running, check that the analog input signal is above 4 mA. This value is displayed on the LCD screen. Check dwell time values for belt length and belt speed.
- Check incoming power supply to panel, main fuse (F01) and grounding connections
- Check the following status LED's on the PCB:

  SEL SW is on

  CUST INT'LK is on

  CUST STATUS is on

  PANEL LAMP is on

- Check fuses F6 and F7 on PCB card. F6 is for the motor forward and reverse, while F7 is for the home and motion sensors, customer interlock and on/off selector switch.
- Check motor and sensor cabling to ensure connections are secure at motor housing, termination box and panel
- Use a multi meter to measure power supply for motion and home sensors
- Check that customer interlock connections are secure, or jumper wires are in place

9.2 General Inspection of control panel

- Check all ROSSILATOR control cable connections to the terminal blocks and ensure all connections are tight.
- Check all ground wires and ensure they are properly connected.
- Check all fused terminal block fuses.
- Check PLC or PCB for any physical damage.
- Check PLC or PCB input terminal strip and ensure it is snapped properly in place.
- Check PLC or PCB output terminal strip and ensure it is snapped properly in place.
- Check PLC or PCB LED's for fault condition

9.3 General Inspection of Rossilator

- Check for any physical damage, ensuring there are no dents or broken components.
- Check plugs to ensure they are tight.

9.4 No Power to PLC or PCB

- Check incoming 120 VAC power supply wiring to control panel.
- Check main fuse in control panel. Power supply LED must be ON.

9.5 When started the Rossilator motor is on but it doesn't move

- Check for water penetration in junction box, missing connection between Control Panel and Rossilator.
- Check the ROSSILATOR wiring blocks making sure they are connected properly.
- Ensure the ROSSILATOR control cable forward and reverse wires are not reversed at the terminal blocks. Resistance reading as follows:
    - **Junior Model:**
      FWD - N = 77 ohms
      REV - N = 77 ohms
      FWD - REV = 77 ohms
    - **Standard Model:**
      FWD - N = 16 ohms
      REV - N = 16 ohms
      FWD - REV = 327 ohms
- Check ROSSILATOR control cable home sensor wire making sure it is connected to the terminal block.
- Ensure the ROSSILATOR control cable home and motion wires are not reversed at the terminal blocks.
- Check the PLC/PCB sensor power supply and ensure it is supplying sensor power.
- Check PLC/PCB input LED for the home sensor and motion sensor.

9.6 When started the Rossilator runs for a few seconds, goes into Alarm and shuts down

- Check ROSSILATOR control cable motion sensor wire making sure it is connected to the terminal block.
- Check the PLC sensor power supply and ensure it is supplying power to the motion sensor.
- Check PLC input LED for the motion sensor.
- Check ROSSILATOR to see if it has jammed.
- Check the alignment of the ROSSILATOR and Shower.
- Check for mechanical binding.
- If all of above are correct the motion sensor would be suspect.

9.7 When the Rossilator goes out to its maximum limit, jams, goes into alarm and shuts down

- Check ROSSILATOR™ control cable reverse wire and ensure it is properly connected to the terminal block.
- Check to see if the ROSSILATOR™ has jammed.

9.8 When using a speed sensor or analog input (for machine speed reference)

IF STATION IS STARTED, THE ROSSILATOR DOESN'T MOVE AND GOES INTO ALARM AND SHUTS DOWN:

- This will occur when the PLC/PCB is not receiving pulses from the speed sensor or does not receive at least 4 mA machine speed signal.
- Check PLC/PCB 24 VDC power supply ensuring that is supplying power to the speed sensor or check the analog machine speed signal.
- Check all speed sensor wiring connections to the terminal blocks.
- Input LED on the PLC should be on if the speed sensor is operating.
- Check speed sensor alignment.
- If all of above are correct the speed sensor would be suspect.

9.9 Forward or reverse operating when they should not

- This would indicate a damaged or defective triac output.

9.10 ROSSILATOR is emitting excessive noise

- Check Rossilator screw and motor housing for any obvious signs of damage
- Remove the detent pin between the Ross Link and the Rossilator Clevis and check the Rossilator' internal screw and nut for wear by pulling and pushing in and out on the tube. If the tube moves more than .010" the unit will require a rebuild.
- With the Rossilator disconnected from the shower, move the shower by hand to ensure that it slides easily in its bearings or bushings
- If the shower has an outer pipe assembly, make sure there is no debris restricting the motion of the inner pipe assembly. Move the inner pipe assembly by hand to ensure freedom of movement
- Ensure that the Rossilator and shower pipe are properly aligned
- Ensure that the water supply line and drain line (if it is a brush shower) have sufficient travel to allow the full stroke of the shower

10 Warranty and Guarantee

All new Rossilators are fully warranted for 12 months from date of installation or 18 months from date of supply. Extended warranty can be granted only if authorized James Ross personnel perform the installation service. Contact your James Ross Limited representative for further information.

JAMES ROSS LIMITED warrants that the ROSSILATOR™ System is free from defects, faulty materials or faulty workmanship for a period of one year from the date of purchase.

JAMES ROSS LIMITED also warrants that the ROSSILATOR™ System will perform to design specifications, provided it is installed according to installation instructions provided.

This guarantee is null and void if the ROSSILATOR™ is damaged through no fault of JAMES ROSS LIMITED, or if the ROSSILATOR™ is disassembled and incorrectly assembled and activated.

This guarantee is null and void should the ROSSILATOR™ not be connected to its shower by a double ended spherical rod end link supplied either by JAMES ROSS LIMITED or obtained directly by the end user.

JAMES ROSS LIMITED can not be held responsible for any damage to related equipment or production loss caused by a Rossilator. To prevent injuries or damages caused due to improper handling, installation or repair of Rossilators only qualified personnel (James Ross Service) should handle repair work and installation.

10.1 Rebuild Guarantee

James Ross Limited provides rebuilding services for all its oscillation systems. Our rebuilds repair the unit and upgrade it to current design standards. All Rossilators rebuilt by James Ross Limited are fully warranted for 12 months from date of installation or 18 months from date of supply. Contact your James Ross Limited representative for further information.

11 James Ross Contact Information

Any problems encountered with any of the ROSSILATOR™ family should be reported to JAMES ROSS LIMITED. The **serial number** should be determined beforehand to enable us to better help you. The **serial number** is stamped on the front housing of the ROSSILATOR™.

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PLEASE DO NOT SHIP ROSSILATORS BACK TO JAMES ROSS WITHOUT CONSULTATION!