

ORBI G3 AND ORBI G4 OPERATION & MAINTENANCE INSTRUCTIONS



Read all instructions in this manual before operating machine.

GENERAL

The **SELLERS** “**ORBI-G3**”™ “**ORBI-G4**”™ are hydraulically driven rotating heads with nozzles ejecting streams of liquid for spraying internal tank surfaces to be cleaned, sanitized, treated, or rinsed. The Orbi-G3 model incorporates a set of bevel gears to provide a complete 360° indexing path in both planes, the index pattern of 4° will repeat every 45 revolutions. The Orbi-G3 is specifically designed for 3” Diameter openings, but care must be exercised during insertion and retraction of this unit because of the nozzle swing span. The Orbi-G4 incorporates 2 nozzle heads thus 4 nozzles, and is designed to fit through a 3.75” Diameter opening. The units may be installed on a permanent basis (C.I.P.). Many types of fluids, sanitizers, detergents solvents and caustics may be used through this unit to assist its cleaning effectiveness. (Please note caution below) The cleaning effectiveness of any unit is proportional to all the applicable variables, such as volume, pressure, chemicals, impingement, drainage, soils, etc. The unit will only operate properly when mounted in the vertical position (suspended or inverted) and can clean almost any type of contained area within its range.

Caution: If chemicals, hazardous materials, operations, and equipment are used in conjunction with this cleaning equipment, it is the responsibility of the user to establish appropriate associated safety and health practices. Prior to application, the user must consult and determine the applicability of regulatory (federal, state, local and facility) safety and environmental agency limitations.

MODELS

Orbi-G3

75-1858 = Orbi-G3; Geared Base Model, Ø.234 Nozzles, 150-300 PSI, 20-27 GPM
75-1858LP = Orbi-G3; Geared Based LP for Ø.234 Nozzles, 75-150 PSI, 13-18 GPM

Orbi-G4

75-1861C = Orbi-G4C; Geared Duplex std , (4) Ø.172 Nozzles, 150-300 PSI, 23-33 GPM
75-1861CLP = Orbi-G4CLP; Geared Duplex low pressure, (4) Ø.172 Nozzles, 50-140 PSI, 11-21 GPM

75-1861D = Orbi-G4D; Geared Duplex , (4) Ø.125 Nozzles, 150-300 PSI, 15-21 GPM
75-1861DLP = Orbi-G4D; Geared Duplex low pressure, (4) Ø.125 Nozzles, 50-140 PSI, 8-14 GPM

MATERIALS

The “Orbi” is made of 316 (UNS S31600) stainless steel with the exceptions of the shaft bushings, which are made of Teflon, the nozzle body bushings, which are Gardur (UHMW-PE) and the roll pin and retaining rings which are 420C and 15-7PH stainless steel respectively. No lubricants are required.

CONSTRUCTION

Referring to drawing 75-1858 or 75-1861, the unit consists of two basic components; the drive, comprising of the body, motor, rotor, and shaft; and the nozzle head, comprising of the nozzle body, bushings, nozzles, and elbow shaft. These unit’s construction does not require lubrication of any kind for operation.

ROTATION

The liquid enters the inlet cap (1) and then flows through the oblique and bypass holes in the motor (2) causing a swirling motion in the liquid. This swirling liquid goes down the outside of the vertical shaft (5) past the 6 tooth rotor (3) imparting rotation to the rotor and thus the vertical shaft. The liquid flows through the elbow shaft into the nozzle body (7), to be distributed out each off-set nozzle (12). The rotational speed of these units can be regulated through the use of various motor bypass plugs, which influences the fluid diversion to provide additional speed, reference the trouble shooting section and the drawing parts list for additional information and location.

THROUGHPUT

The amount of liquid going through a “Orbi” is proportional to the pressure applied. Increasing the pressure will increase the throughput. For specific information refer to the flow curve. Please note the operating pressure range.

CLEANING/WETTING RADII

The cleaning and wetting distances are a function of rotational speed and liquid pressure applied. The slower the unit rotates and the higher the pressure applied, the greater the distances. The Orbi-G3’ and G4’s maximum wetting radius is about 22 ft. (6.7 m) with an effective cleaning radius of 15 ft. (4.6m), but actual results will also depend on the type and condition of soils to be removed.

SUPPLY SOLUTION PRESSURE

The minimum amount of liquid that will satisfactorily run the “Orbi” is about 8 GPM (1.6 M³/hr) at 50 PSI (3.4 BAR) and the maximum is about 40 GPM (9.1 M³/hr) at 300 PSI (20.7 BAR). The Sellers B-Jets will supply the mid-range of these parameters for a single unit depending upon the model.

INSTALLATION

The “Orbi” is very easy to install as it has a single female pipe thread connection. It may be suspended from a pipe, or manhole cover. In all installations a suitable strainer should be used (such as a 20 Mesh “Y” strainer) to prevent dirt or scale from clogging the waterways or openings.

Warning: In closed tanks, provisions should be made for adequate venting during operation to allow the escape of any gases or volatile vapors which may be produced during operation. This will also prevent the tank from collapsing due to vacuum formation, which can be caused by a cold rinse cycle in a warm tank.

OPERATION

To start the unit, turn on the fluid. An in-line valve is advised for a slow build-up of liquid pressure in the unit to prevent “water hammer”. To stop the unit, turn off the liquid. The unit should always be handled carefully. If the unit is dropped or maltreated it may cause internal damage to the drive pod assembly, which in turn can affect the performance of the unit. If handled properly the unit will perform well and provide dependable service.

OPERATION & SPECIFICATION SHEET

Refer to drawing 75-1840, 75-1858 or 75-1861 for assembly and parts list.

Pipe Connection		3/4" Female NPT
Operating Pressure Range	(Based on Models)	50-300 PSI (3.4-20.7 BAR)
Maximum Operating Temperature		250° F (121° C)
Flow Capacity	(Based on Models)	8-40 GPM (1.6- 9.1 M ³ /hr)
Head Rotation	(Orbi-G3 & Orbi-G4)	10-18RPM
*Effective Cleaning/Wetting Radius		To 15 ft maximum (4.6 m)
Nozzle quantity & orifice diameter (Orbi-G3)		2 x Ø.234" (*5.8mm)
Nozzle quantity & orifice diameter (Orbi-G4)		4 x Ø.172" (*5.8mm), .125" (3.2mm)
Overall Head Length x Body Diameter		6 1/4" x 2 1/32" (159mm x 51.5mm)
Installation Hole diameter	(Orbi-G3)	Ø3" (Ø76 mm)
Installation Hole diameter	(Orbi-G4)	Ø3.75" (Ø89 mm)
Approximate Weight	(Orbi-G3)	2 lbs (.9 kgs)
Approximate Weight	(Orbi-G4)	3 lbs (1.4kgs)
Materials of Construction		316 Stainless Steel, Teflon & UHMW-PE
**Recommended Solution Strainer (not included)		20 Mesh (1/32" openings)
*Depends on type and conditions of soils to be removed		
**Required for most applications to prevent fouling or plugging of the unit from foreign material, i.e., scale, grit, and soils in solution.		
Additional strainers and/or finer mesh screens may be required depending upon the amount, nature, and size of foreign materials in solution.		

NOTE: Consult Sellers where operating conditions are not covered in the above specifications.

TROUBLE SHOOTING

Due to the simplicity of the unit, very few problems should occur. If any trouble should arise, the following steps may be taken: Refer to the drawing 75-1858, or 75-1861.

- A. Check units for external damage, look for evidence of mishandling that may have damaged shafts, bearings, or alignment.
- B. If the nozzle body fails to rotate and no liquid passes:
 1. Check for liquid pressure and volume at the unit.
 2. Check strainer for filter blockage.
 3. Remove nozzles and check for obstructions.
 4. While nozzles are off, recheck for flow through the nozzle body.
- C. If the unit fails to rotate and sufficient liquid passes:
 1. Check for freedom of rotation, by hand, in the vertical and rotational axis.
 2. If the unit is free, insert a motor bypass plug. The motor bypass plug port is located in the top center of the motor. The purpose of the plug is to divert the pressurized fluid to the side drive holes of the motor, thus providing more driving power to overcome any frictional build-up that may occur after extended use. There are 2 standard sized plugs included with every unit, a drilled plug with a orifice, which will provide an incremental speed increase and a solid plug, which diverts all the fluid thus giving the fastest rotation. If the unit now rotates, the problem is minor friction. If the unit still does not rotate, check for:
 - a. Contamination in the unit.
 - b. Wear of the Teflon and Gardur parts: the bushings, washers, and the rotor.
 - c. Galling and straightness of the shafts.

Replace all defective parts. **No lubrication!**

SERVICING-DISASSEMBLY

- A. Refer to drawing 75-1858 or 75-1861.
1. Unscrew inlet cap (1) and remove motor (2) from body (4).
 2. Hold elbow shaft (9) and unscrew rotor (3) and vertical shaft (5).
 3. Push out bushing (6) and washer (14) from body (4).
 4. Unscrew cap (10) from elbow shaft (9).
 5. Remove nozzle body (7) from elbow shaft (9).
 6. Unscrew nozzles (12) from nozzle body (7).
 8. Remove rings (11) from body and pull out bushings (8).
 9. Orbi-G3, G4 remove snap ring (15) and pull off gear (16).

SERVICING-ASSEMBLY

- A. Refer to drawing 75-1858 or 75-1861.
1. Orbi-G3, G4 place gear (16) over body (4) until pin engages locating pin (17) and install ring (15).
 2. Press bushing and washer (6) and (14) into body (4).
 3. Screw shaft (5) to elbow shaft (9).
 4. Screw rotor (3) onto shaft (5).
 5. Insert motor (2) in body (4).
 6. Install inlet cap (1) into the body.
 7. Assemble bushings (8) into nozzle body (7).
 8. Assemble retaining rings (11) into nozzle body (7).
 9. Screw nozzles (12) into nozzle body (7).
- .Assemble nozzle body (7) onto elbow shaft (9) and tighten cap (10) , tighten with wrench.

PARTS FOR "Orbi-G3"(75-1858) & "Orbi-G4" (75-1861)

PART NO.	REFERENCE NO.	DESCRIPTION
1 G3, G4)	75-1403	Cap, Inlet
2 (G3, G4)	75-1857	Motor, Water,4 Drive Holes
3 (G3, G4)	75-1801SS	Rotor, 6T-SS
4 (G3, G4)	75-1853	Body, Main altered for Gear
5 (G3, G4)	75-1854	Shaft, Vertical 1.75" Lg
**6 (G3)	75-1408	Bushing-TFE
(G4)	75-1862	Bushing-TFE
7	75-1851	Body, Nozzle, Geared
**8 G3, G4)	75-1846	Bushing, Nzl Body
9		
(G3)	75-1859	Shaft, Elbow, 12 Hole
(G4)	75-1860	Shaft, Elbow, Duplex
10 (G3, G4)	75-1844	Cap, Shaft
**11 (G3, G4)	75-1847	Ring, Retaining

12 (G3)	75-1849AA	Nozzle, Ø15/64" (.234")
(G4)	75-1849CA	Nozzle, Ø11/64" (.172")
	75-1849DA	Nozzle, Ø1/8" (.125")

(NOTE: **75-1848 Vane, Stream Straightener are used on all nozzles)

13 (G3, G4)	Motor Bypass & Motor Drive Plugs	
	**7-33-1	Solid
	75-1455-A	Orifice Ø.06
	75-1455-B	Orifice Ø.09
	**75-1455-C	Orifice Ø.12
	75-1455-D	Orifice Ø.14
	75-1455-E	Orifice Ø.16

**14		
(G3, G4)	75-1863G	Washer, UHMW-PE
15 (G3, G4)	75-1855	Ring, Retaining
16 (G3, G4)	75-1852	Gear, Bevel
17 (G3, G4)	75-1856	Pin, Roll, 062
18 (G3)		
(G4)	75-1455-D	Orifice *.140

*Recommended spare parts **Plugs supplied with unit

IMPORTANT: When reassembling the 75-1851 Geared nozzle body they must be placed at 90 degrees from each other to assist rotation. Please refer to maintenance video on website at www.cloudinc.com