

# TankJet® 78M Tank Cleaners

## USER GUIDE



This unit meets the requirements of 3-A Sanitary Standard 78. Spray cleaning devices intended to remain in place.



**Spraying Systems Co.®**  
Experts in Spray Technology

MI-TJ78M  
[spray.com](http://spray.com)

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## GENERAL SAFETY INSTRUCTIONS

### READ AND FOLLOW INSTRUCTIONS:

**WARNING:** All safety related and operating instructions should be read before the nozzle is operated. Follow all operating instructions. Failure to do so could result in serious injury.

- **WARNING:** It is important to recognize proper safety precautions when using a pressurized spray system. Fluids under pressure can penetrate skin and cause severe injury.
- **WARNING:** When dealing with pressure applications, the system pressure should never exceed the lowest rated component. Always know your system and all component capabilities, maximum pressures and flow rates.
- **WARNING:** Before performing any maintenance, make sure all liquid supply lines to the machine are shut off and/or disconnected and chemical/fluid are drained.
- **WARNING:** The use of any chemicals requires careful control of all worker hygiene.
- **WARNING:** Spraying Systems Co. does not manufacture or supply any of the chemicals used with this equipment and is not responsible for their effects. Because of the large number of chemicals that could be used and their different chemical reactions, the buyer and user of this equipment should determine compatibility of the materials used and any of the potential hazards involved.
- **WARNING:** Before use, be sure appropriate connections are secure and made to withstand weight and reaction forces of the operating unit.
- **WARNING:** Spraying Systems Co. strongly recommends the use of appropriate safety equipment when working with potentially hazardous chemicals.

**This equipment includes but is not limited to:**

- Protective hat
- Safety glasses or face shield
- Chemical-resistant gloves and apron
- Long sleeve shirt and long pants

*NOTE: Always remember to carefully read the chemical manufacturer's label and follow all directions.*

- **WARNING:** DO NOT USE TO SPRAY FLAMMABLE LIQUIDS — SUCH USE COULD RESULT IN FIRE OR EXPLOSION CAUSING BODILY INJURY OR DEATH.
- **WARNING:** Never operate tank cleaning equipment in the open due to the potential of bodily injury.
- **WARNING:** It is important to operate equipment within the temperature range of all components. Also ensure that appropriate time lapses or proper safety equipment is used when handling components after they're exposed to high temperatures.
- **WARNING:** Remove equipment from the tank before attempting any repairs.
- **WARNING:** Proper hoisting procedures should be used when installing and removing all equipment.
- **WARNING:** If walking on top of a tank is deemed safe and is necessary, use proper safety precautions to protect individuals as well as the equipment.
- **WARNING:** Do not put any part of your body in the tank during operation of the tank cleaner. This is NOT a safe procedure for verification of operation.
- **WARNING:** To ensure the safety of the equipment as well the individuals using them, only use Spraying Systems Co. components.
- **WARNING:** When packaging and transporting, use structurally sound boxes or crates that can handle the weight of the equipment.
- **WARNING:** Tank cleaners should be flushed out with clean water before they're stored or shipped to minimize health hazards or cross contamination.
- **WARNING:** Do not use any equipment outside the intended purposes of the product. Misuse can result in personal injury or product damage.

The container being cleaned should be sealed as well as possible while the TankJet 78 models are running. The combination of temperature, cleaning solution, spray impact and the potential toxic materials being cleaned can cause a hazard to anyone in the path of the spray.



## INTRODUCTION

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The TankJet® 78M is a hydraulically driven rotating head with nozzles ejecting streams of liquid for internal tank surface cleaning, sanitizing, treating, or rinsing. The TankJet 78M model incorporates a set of bevel gears to provide a complete 360° indexing path in both planes. The index pattern will repeat every 25 revolutions. This unit is specifically designed for a minimum 2.87" opening (typically for 3" Tri-Clamp Flange connections). Like the TankJet 78 and 78D, care must be exercised during insertion and retraction of the unit because of the nozzle swing span.

The unit is designed to be self-cleaning, such that it is normal for it to spray water outward from joints and pin connections. The unit may be installed on a permanent basis and is approved for Clean-in-Place (CIP) applications. However, it is strongly suggested the unit be regularly removed from service and cleaned out-of-place (COP) to remove any debris or other solids that may have collected

during operation. This can be a common occurrence in systems where cleaning fluids are recirculated from the tank and back through the unit.

Many types of fluids, sanitizers, detergents, and caustics may be used through this unit to assist its cleaning effectiveness (note caution below). The cleaning efficacy of any unit is proportional to all the applicable variables, such as volume, pressure, temperature, chemicals, impingement, drainage, soils, etc.

***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 federal, state, local, and facility regulations.***

## TECHNICAL SPECIFICATIONS

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### TANKJET 78M MODELS:

#### TJ78M- \* -2-175-3A

- Nozzle Orifice: 0.175"
- Operating Pressure: 25 -120 psi (1.7 – 8.3 bar)
- Flow Rate: 13 – 37 gpm (49.2 – 140.1 l/min)

\*Specify inlet size of ¾" or 1".

### MATERIALS:

- Stainless Steel, type 316L
- PTFE

### CONSTRUCTION:

Referring to the Parts Lists on Pages 7 & 8, the TankJet 78M comprises of three basic components: the support structure, consisting of the housing, stator, seals, and stem; the drive, consisting of the rotor, bearings, and rotary housing; and the nozzle head, consisting of the hub, nozzles, and hub cap. The unit is held together using Retaining Clips, such that it can be quickly and easily assembled and reassembled without the use of tools.

### PRINCIPLE OF ROTATION:

The liquid enters the inlet (1) and then flows through the slots in the stator (3), causing a swirling motion in the liquid. This swirling liquid drives against the fins of the rotor (7), imparting rotation to the rotor (7) and thus the rotary housing (12). The liquid then flows through the rotary housing and nozzle hub (16) to be distributed out each off-set nozzle.

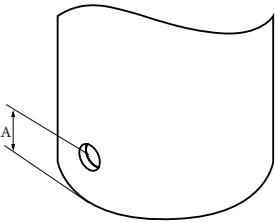
### CLEANING DIAMETER:

The cleaning and wetting distances are a function of rotational speed and liquid pressure applied to the unit. The TankJet 78M has an effective cleaning diameter of 25ft. (7.62m)



## INSTALLATION

The TankJet® 78M is easy to install. The TankJet 78M connects to a supply tube with a simple retaining clip. There are two different size options for inlet connections to the TankJet 78M; 3/4" & 1". The supply line should be standard smooth bore 16 gauge (.065" thick) stainless steel tube of the appropriate size. A 9/64" or 3.5mm hole should be drilled through the supply tube according to the diagram below.



Inlet Size	"A"
3/4"	1/4" (6.35mm)
1"	3/8" (9.52mm)

Slip the supply tube into the inlet of the unit, aligning the holes. Insert the retaining clip and swing it down until it locks. It should wrap around the neck of the inlet, but still fit loosely.

The TankJet 78M unit will only operate properly in the suspended vertical position (inlet at top).

*NOTE: In order to maintain 3-A sanitary compliance, all units intended for CIP must be mounted in the suspended vertical position in order to ensure proper drainage. Other orientations must be either returned to the suspended vertical position or removed after operation and cleaned out-of-place.*

## OPERATION

Refer to drawings on pages 9 thru 11 for parts list.

Specifications	
<b>Inlet Connection:</b>	3/4" or 1" slip-fit
<b>Operating Pressure Range:</b>	25 – 125 psi (1.7 - 8.3 bar)
<b>Max. Operating Temp:</b>	200°F (93°C)
<b>Flow Capacity:</b>	13 – 37 gpm (49.2 – 140.1 l/min)
<b>Effective Cleaning/Dia.:</b>	To 25 ft. (7.6 m) maximum
<b>Installation Hole Dia.:</b>	2.87" (3" Tri-Clamp Flange Connection)
<b>Approximate Weight:</b>	4.1 lbs. (1.9 kg)
<b>Recommended Strainer:</b>	50 mesh (not included)



## TROUBLE SHOOTING GUIDE

The following table indicates various potential modes of failure for this product.

Mode of Failure	Preventative or Corrective Actions
<b>Poor spray performance</b>	Check unit for external damage. Look for evidence of mishandling that may have damaged shafts, bearings, or alignment.
<b>Nozzle hub fails to rotate and no liquid passes:</b>	Check for liquid pressure and volume at the unit.
	Check strainer for filter blockage.
	Remove nozzles and check for obstructions.
	While nozzles are off, recheck for flow through the body.
<b>If the unit fails to rotate and sufficient liquid passes:</b>	Check for freedom of rotation, by hand, in the vertical and rotational axis.
	If the unit is free and still does not rotate, check for: <ol style="list-style-type: none"> <li>1. Contamination in the unit.</li> <li>2. Wear of any of the bushings or bearings.</li> <li>3. Galling and straightness of the shaft.</li> </ol>

**WARNING: Replace all defective or worn parts.**

## SPRAYING SYSTEMS CO. WARRANTY

Seller warrants that its products will conform to and perform in accordance with the products' specifications. Seller warrants that the products do not infringe upon any copyright, patent or trademark. THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THOSE CONCERNING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Because of the difficulty of ascertaining and measuring damages hereunder, it is agreed that, except for claims for bodily injury, Seller's liability to the Buyer or any third party, for any losses or damages, whether direct or otherwise, arising out of the purchase of product from Seller by Buyer shall not exceed the total amount billed and billable to the Buyer for the product hereunder. IN NO EVENT WILL SELLER BE LIABLE FOR ANY LOSS OF PROFITS OR OTHER SPECIAL OR CONSEQUENTIAL DAMAGES, EVEN IF SELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

For newly purchased units, the warranty is 18 months from the date of shipment or 12 months from the date of installation, whichever occurs first. This warranty includes manufacturing defects but does not cover wear of components. This warranty will be void if parts other than those supplied by Spraying Systems Co. are used or if the unit is modified by anyone other than authorized Spraying Systems Co. personnel. Modifications to the unit may void the 3-A symbol and put the unit outside 3-A sanitary compliance.



## SERVICING

### REPLACEMENT PARTS:

When the device requires replacement parts, only Spraying Systems Co. components should be used, in order to maintain proper machine operation and safety.

### DISASSEMBLY:

Be sure to use caution when handling the TankJet® 78M. Always work on a flat, stable surface. The TankJet 78M will stand upright on the tabletop to ease disassembly.

1. Remove the top and bottom Body Clips (6).
2. Remove the Inlet (1), Stem Pin (4), and Stator (3).
3. Remove the Housing (5).
4. Remove the Rotor Retaining Clip (9), The Rotor (7), and Stem Bearing (8).
5. Remove the Housing Gear (10), and Rotary Housing Bearing (11).
6. Remove the Dowel Pin (13) that supports the Hub Gear Assembly (16, 17, & 18).
7. Remove the Hub Gear Assembly, which includes the Nozzle Hub (16), Hub Cap (18), and Hub Cap Bearing (17). Separate them and set aside.
8. Remove the remaining Rotary Housing Bearing (11) from the Rotary Housing (12).
9. Lift the Rotary Housing (12) off the Main Bearing (14) and Stem (15) and set aside.
10. Separate the Main Bearing (14) from the Stem (15).

### ASSEMBLY:

Be sure to use caution when handling the TankJet 78M. Always work on a flat, stable surface. The TankJet 78M will stand upright on the tabletop to ease disassembly.

Before reassembling, inspect all parts for wear or damage. Replace all defective or worn parts. Parts must be clean and free of dirt or debris to ensure proper operation.

1. Place the Main Bearing (14) onto the Stem (15).
2. Place the Rotary Housing (12) onto the Stem (15) and Main Bearing (14).
3. Place a Rotary Housing Bearing (11) onto the Face of the Rotating Housing (12).
4. Assemble the Hub Gear Assembly, which includes the Nozzle Hub (16), Hub Cap (18), and Hub Cap Bearing (17).
5. Then place said Hub Gear Assembly onto the face of the Rotary Housing (12), then place the Dowel Pin (13) into the Rotary Housing (12) to keep the assembly in place. The

Hub Cap (18) and Dowel Pin (13) may not line up perfectly on the first attempt, to line them up, simply spin the Hub Cap (18) in either direction till the Dowel Pin (13) drops into place.

6. Place another Rotary Housing Bearing (11) onto the top of the Rotary Housing (12), then place the Housing Gear (10) on top of that. When lined up correctly, the Housing Gear (10) should be able to spin the Nozzle Hub (16) and vice versa.
7. Place the Stem Bearing (8) onto the Stem (15) and slide it into the Rotary Housing (12). Then place the Rotor (7) over the Stem Bearing (8) and secure it in place with the Rotor Retaining Clip (9).
8. Place the Housing (5) onto the Housing Gear (10), and then place the Stator (3) inside of the Housing (5) and secure it with the Stem Pin (4).
9. Place the Inlet (1) over the Housing (5).
10. Secure the TJ78M assembly with the two Body Clips (6) over the Inlet (1), Housing (5) and Housing Gear (10).

### SPECIAL CLEANING INSTRUCTIONS:

When using corrosive chemicals for cleaning operations, special care must be given after a cleaning cycle to remove them. Cleaning off the chemicals prevents damage to the TankJet 78M and helps to minimize health hazards or cross contamination.

1. Allow all chemicals to drain from the TankJet 78M.
2. When possible and appropriate for the process, supply clean water to the unit and run a complete cleaning cycle for 3 to 6 minutes.
3. If not possible to flush with clean water in the process vessel, using appropriate safety equipment for working with potentially hazardous chemicals, remove unit from vessel and submerge in an open top 55-gallon (200-litre) drum filled with clean water for 5 to 10 minutes.
4. Using appropriate safety equipment for working with potentially hazardous chemicals, remove unit from drum and follow disassembly instructions above, rinsing each individual part in clean water.
5. Once individual parts are clean and dried, inspect for wear or damage and replace as necessary.
6. Reassemble unit using instructions above.

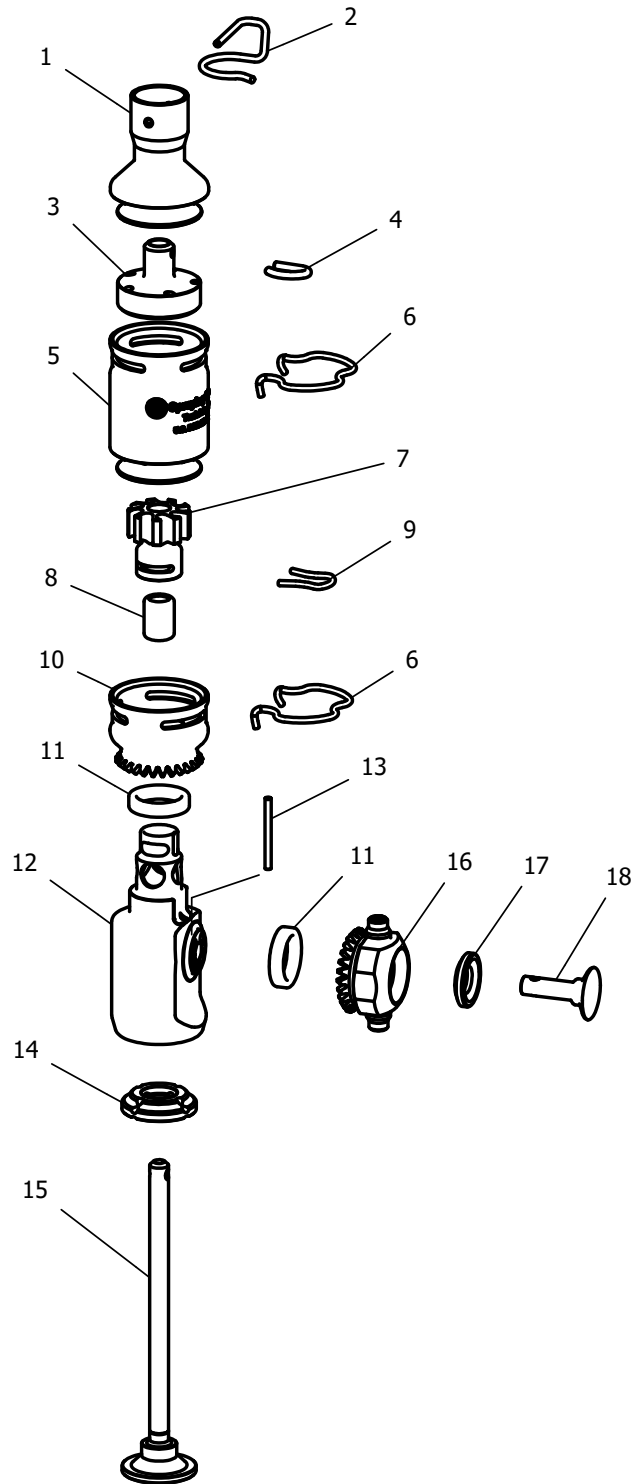


# PARTS LIST

## TJ78M- \*\_ -2-175-3A SANITARY TANK CLEANING NOZZLE

Item No.	Part No.	Description
1	CP116027-_*_-316L	INLET
2	CP63224-_*_-316SS	WRAP-AROUND RETAINING
3	CP116028-166-316L	STATOR
4	CP116036-316L	STEM PIN
5	CP116021-316L	HOUSING
6	CP116037-177HS	BODY CLIP
7	CP116029-316L	ROTOR
8	CP116039-TEF3A	STEM BEARING
9	CP116038-316L	ROTOR RETAINING CLIP
10	CP116026-316L	HOUSING GEAR
11	CP116041-RUL	ROTARY HOUSING BEARING
12	CP116030-316L	ROTARY HOUSING
13	CP116031-316L	DOWEL PIN
14	CP116040-RUL	MAIN BEARING
15	CP116035-316L	STEM
16	CP116024-2-175-316L	NOZZLE HUB
17	CP116042-RUL	HUB CAP BEARING
18	CP116043-316L	HUB CAP

\*For 1" inlet, specify CP116027-1-316L and CP63224-1-316SS. For ¾" inlet, specify CP116027-3/4-316L, and CP63224-3/4-316SS.





***Spraying Systems Co.***  
Experts in Spray Technology

North Avenue and Schmale Road. P.O. Box 7900, Wheaton, IL 60187-7901 USA

Tel: 1.800.95.SPRAY

Intl. Tel: 1.630.665.5000

Fax: 1.888.95.SPRAY

Intl. Fax: 1.630.260.0842

Email: [info@spray.com](mailto:info@spray.com)

[www.spray.com](http://www.spray.com)

