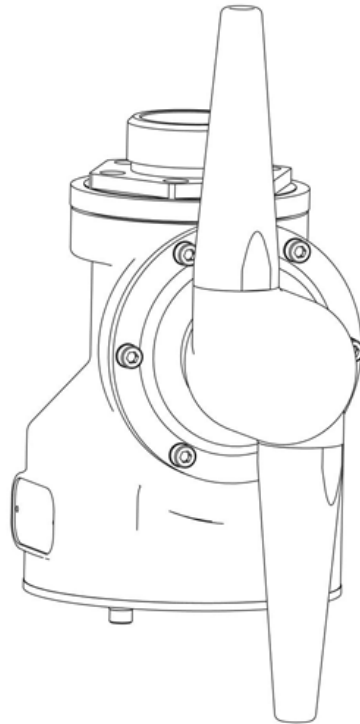




## Operation and Maintenance Guide



Tank Cleaning machine TC-110J

Models	Descriptions
TC-110J	Tank Cleaning Machine

Read this manual carefully before installing, operating or servicing this equipment. It's the responsibility of the employer to ensure this manual is read by the operator. Please preserve this manual.

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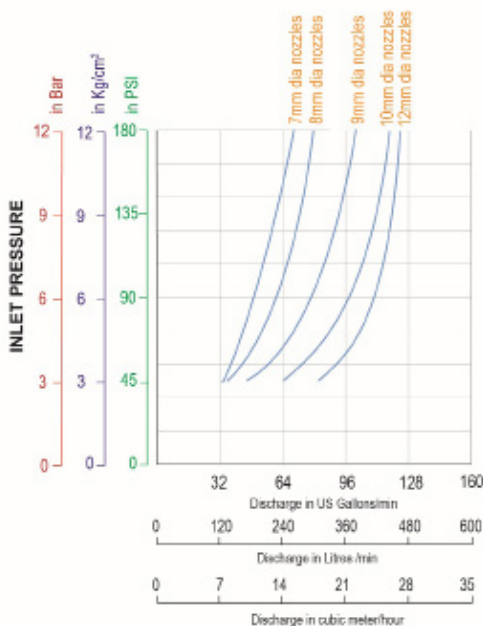
These are twin nozzle tank washing machines. They have a Stainless Steel 316L construction combined with PEEK gears for durability and chemical resistivity. The two opposing nozzles continuously rotate in two axes and complete a complete cleaning cycle in 20 minutes

Suitable for use with various cleaning media including water, crude oil, and cleaning chemicals, both hot and cold. Its easily repairable on-site and teryair spares are widely available.

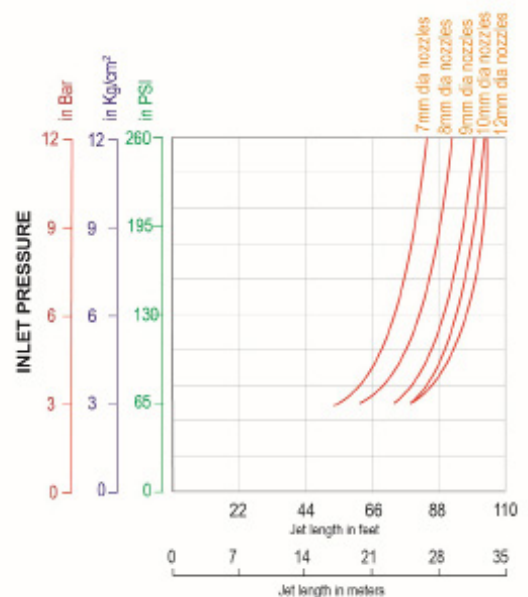
### Technical Data TC-110J

Type Approval	Certificate Of Type Approval From Lloyd's Register
ATEX Code	⚠ II 2 GD Ex h IIC T6 Gb / ⚠ Ex h IIIC T85°C Db
Type Approval No	LR2011185mc
Maximum Discharge	27m <sup>3</sup> /Hr, 450 Litres/Min
Maximum Jet Length	31 Mtrs, 100feet
Operating Pressure Range	3 To 12 Bar
Machine Weight	7 Kgs, 15.4lbs
Temperature Upto	90 Deg C
Cycle Time	20 Mins (With Std 8mm Nozzle And 8 Bar Supply Pressure)
Portable Thread Detail	1-1/2 Inch Bsp Or 1-1/2 Npt (Pl Specify While Ordering)
Fixed Flange Detail (Opt)	5" Od X 3.88" Pcd X 0.62" Bolt Hole Dia, (127mm, 98.5, 15.7mm Resp) As Ansi B16.5 Class #150

### Performance Graph Inlet Pressure vs Discharge



### Performance Graph Inlet Pressure vs Jet Length



## Intended use

Tank cleaning machine is used to clean large process tanks from process residue that is adhering to the internal wall surface. This tank cleaning machine cleans tank quickly and with the minimum use of manpower. This uses a high pressure nozzle rotating in 360° both horizontally and vertically to cover all the areas. This equipment is self start and uses least amount of water effectively to clean.

## Conditions of certification

1. The delivery tube is to be stress relieved in the deck support region to improve fatigue life.
2. The welding of the tubes is to be performed by qualified welders, and satisfactorily tested.
3. The machine is to be electrically continuous with its mounting flange.
4. Dissimilar materials are to be protected to eliminate bi-metallic corrosion.
5. The machine mounting tubes are to be maintained in a satisfactory condition and critically examined at the same time as Classification Society in tank surveys and also when removed for any other reason.
6. The method of support of the tank machines is to be to the satisfaction of the attending surveyors.
7. After installation it is to be demonstrated no undue vibration of the machine delivery head is induced under normal operating conditions.
8. The openings in the deck and fixing arrangements of the machine must be in accordance with IMO Resolution A.446 (XI), classification society rules and requirements of the administration.


## Safety Instructions

Following symbols are used through out this manual.

### Warning

 If not followed could cause personal injuries


### Caution

 If not followed could result in damage to equipment.

### Warning

 This manual must be read and the operating instructions carefully followed.


### Warning

 Operators under eighteen not allowed to operate this Tank cleaning machine. Operators must be made familiar with the instructions in this manual before attempting to operate the Tank cleaning machine.

### Caution

 Use only genuine Teryair or Teryair approved accessories.

### Warning

 Do not modify this equipment in any way as this will invalidate the warranty and could lead to serious injury.

## Operating instructions

- The tank cleaning machine should be installed in vertical position (upright or upside down). it is recommended to install a filter in the supply line in the order to avoid large particles to clog inside the machine. Before connecting the machine in to the system, all supply lines and valves should be flushed to remove foreign matter.
- This manual has been prepared as a guide for the persons who will be operating and maintaining your tank cleaning machine. The key to long life for your tank cleaning machine will always be a system of carefully planned maintenance; you will appreciate

that a tank cleaning machine which has a rough and dirty job to do will need more frequent attention than one working in ideal conditions.

- You will find the information contained in this manual simple to follow, but should you require further assistance, our Customer service Department and worldwide network of Distributors will be pleased to help you. Please quote the type and serial number with all your inquiries; this will help us to help you. The type and serial number are placed on the gear house of the tank cleaning machine.

## General Installation Instructions

To protect your tank coating it is recommended to mount bumpers on the tank cleaning machine.

The machine as delivered has been tested at the factory before shipping.

## Storage

When storing equipment for any length of time precautions should be taken to prevent corrosion and to maintain equipment in a serviceable condition.

- Remove inlet hose or pipe and run tank cleaning machine out of water to blow out all moisture.
- Put the top cover on the threaded portion.
- Store equipment in dry place.


## Dis-Assembly and Re-assembly instructions

- Unscrew Allen Bolts (26) and Spring Washer (27) from Nipple (7) from Body (5). After removing Nipple (7) remove Guide (9) with gentle tap.(refer Detail A)
- Now unscrew Allen Bolts (26) with Spring Washer (27) and Spacer (19) from top of impeller (8) to remove Impeller (8).
- Now flip the assembly upside down and unscrew Allen Bolts (26) and Spring Washer (27) from Bottom Cover (14) to remove it from Body (5).(refer Detail C)

- Now unscrew Allen Bolts (26) and Spring Washer (27) from Gear frame (06) from Body (5). Now with a gentle tap on top of the Turbine Shaft (16), the gear frame assembly with all its parts will come out. (refer Detail C)
- Now unscrew Allen Bolts (26) with Spring Washer (27) and Spacer (19) from Pinion (17), now remove Pinion (17), Worm Wheel (13), Collar Bush-1 (1) and Collar Bush-2 (2) and replace with new one if found worn-out.(refer Detail D)
- Now unscrew Allen Bolts (26) with Spring Washer (27) and Spacer (19) from Horizontal Shaft (15). Now remove Horizontal Shaft (15), Worm Wheel (13) and Collar Bush-1 (1) and replace with new ones. (if found worn-out)
- g) Now unscrew Allen Bolts (26) and Spring Washer (27) from Bearing cover (18) from Gear Frame (6). Now replace the Bearing (3) with a new one.(if found worn-out)
- Now unscrew Allen Bolts (26) with Spring Washer (27) and Spacer (19) from Turbine Shaft (16). Now unscrew Allen Bolts (26) from Bearing cover (18) from Gear Frame (6) to remove Bearing cover (18) and Turbine Shaft (16) to replace them with new ones. (if found worn-out)
- Now remove Main bush (4) from Stem (10) and replace it with new one if found damaged.(refer Detail C)
- Now unscrew Hub Nozzle Part (12) with Nozzle (11) assembly from Hub Conical Part (22) .Now unscrew Allen Bolts (26) with Spring Washer (27) from Hub Cover (23).
- Now remove Bearing (25), Bevel Gear (21) and Leap Seals (24) from Hub Conical Part (22) and replace with new ones. (if found damaged)
- Now follow the above steps in reverse manner to assemble the tank cleaning equipment.

### Important Warning

It is the sole responsibility of the customer to select the cleaning agent for the cleaning of the matter from the wall of the tank, Keep the following point in consideration, The temperature of the cleaning agent prepared (Concentration + water) as well as surface of the valve shall not increase more than 70°C in any case The temp of the cleaning agent should be compatible to the ignition temp of the matter to be cleaned. Means the temp of the prepared cleaning agent shall always be less than the ignition temp of the matter to be cleaned.

 **Warning:** If the machine is used in potential explosive atmospheres, tapes or joint sealing compounds which are electrical insulators must not be used on threads or joints, unless an electrical connection is otherwise established to ensure an effective earthing. In addition, connecting pipe work, must be electrically conductive and earthed to the tank structure. The resistance between the nozzles and the tank structure should not exceed 20,000 Ohm. This is essential to avoid the build-up of static electricity on the machine.

For further information see CENELEC R044-001 Safety of Machinery, guidance and recommendations for the avoidance of hazards due to static electricity.

**Note:** The machine shall be installed in accordance with national regulations for safety and other relevant regulations and standards.  
 Precautions shall be made to prevent starting of the cleaning operation, while personnel are inside the tank or otherwise can be hit by jets from the nozzles.  
 In EU-countries the complete system must fulfil the EU-machine directive and shall be CE-marked.

### Troubleshooting

Sr. No	Description	Causes Remedial action
1	Slow rotation or failure of the machine to rotate	<p><b>No or insufficient liquid flow</b></p> <ul style="list-style-type: none"> <li>a) Check if supply valve is fully open</li> <li>b) Check if inlet pressure to machine is correct</li> <li>c) Check supply line/filler for restrictions/ clogging</li> <li>d) Remove flange/nipple, guide and impeller and check for clogging in impeller area</li> </ul> <p>If large particles repeatedly get jammed in the machine, install filter or reduce mesh size of installed filter in supply line.</p>
2	Foreign Material Build -up	<p><b>Impeller jammed</b></p> <ul style="list-style-type: none"> <li>a) Disassemble top assembly.</li> <li>b) Remove foreign material if any and clean it.</li> </ul> <p><b>Pinion jammed</b></p> <ul style="list-style-type: none"> <li>a) Disassemble bottom assembly.</li> <li>b) Remove foreign material if any and clean it.</li> <li>c) Change the bushes if worn out.</li> </ul> <p><b>Hub jammed</b></p> <ul style="list-style-type: none"> <li>a) Disassemble hub assembly (see page 6).</li> <li>b) Remove foreign material if any and clean it.</li> <li>c) Change bearing (25).</li> </ul> <p><b>Worm - wheel jammed</b></p> <ul style="list-style-type: none"> <li>a) Disassemble worm wheel assembly.</li> <li>b) Remove foreign material if any and clean it.</li> <li>c) Change the worm wheels (13).</li> </ul> <p><b>Worm - wheel shaft set jammed</b></p>

## Bill of Materials for TC-110J

Sr.No	Description	Part Number	Qty	Repair Kit 538 97 05
1	Collar Bush-1	5380401	2	2
2	Collar Bush-2	5380402	1	1
3	Slide Bearing	5380403	2	2
4	Main Bush	5380404	1	1
5	Body with Collar	5380701	1	
6	Gear Frame	5380702	1	
7	Nipple 1 -1/2" BSP	5380703	1	
8	Impeller	5380704	1	
9	Guide	5380705	1	
10	Stem	5380706	1	
11	Nozzle 8mm	5380707	2	
11A	Sleeve for Nozzle	5383501	10	
12	Hub Nozzle Part	5380708	1	
13	Worm Wheel Assembly	5380801A	2	
14	Bottom Cover	5382701	1	
15	Horizontal Shaft	5382702	1	
16	Turbine Shaft	5382703	1	
17	Pinion	5382704	1	
18	Bearing Cover	5382705	2	
19	Spacer	5382706	4	
20	Gear Wheel W Ball Race	5382707	1	
21	Bevel Gear W Ball Race	5382708	1	
22	Hub Conical Part	5382709	1	1
23	Hub Cover W Ball Race	5382710	1	
24	Lip Seal	5383601	2	2
25	Bearing	5385001	2	2
26	Allen Bolt	5389001	38	
27	Spring Washer	5389002	28	
28	Strainer	5388201	1	1
29	Int. Circlip	2109024S	1	1

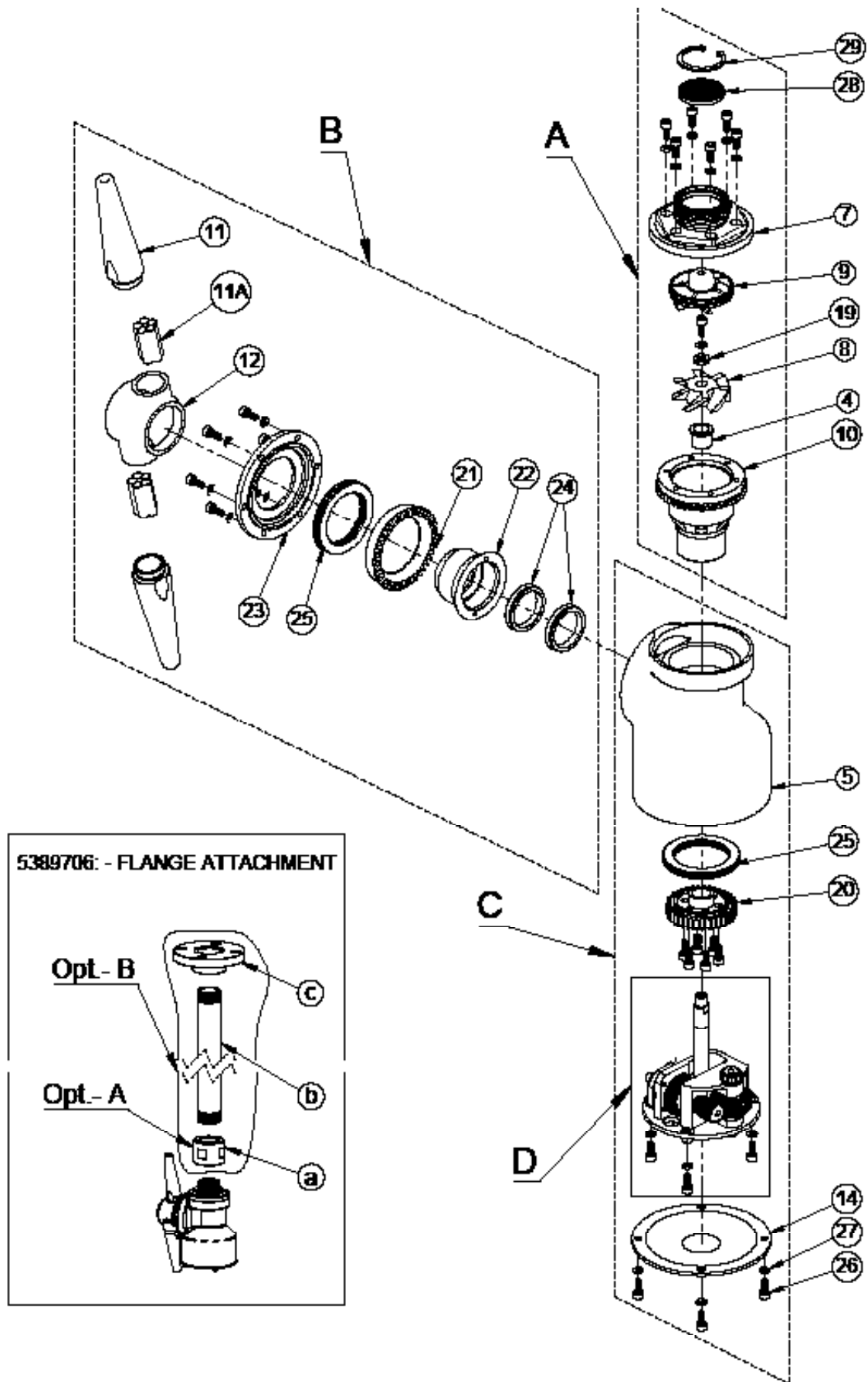
### Additional Attachment

Opt.- A	5380719	Coupling Attachment 1½" BSPP	1
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### Additional Attachment

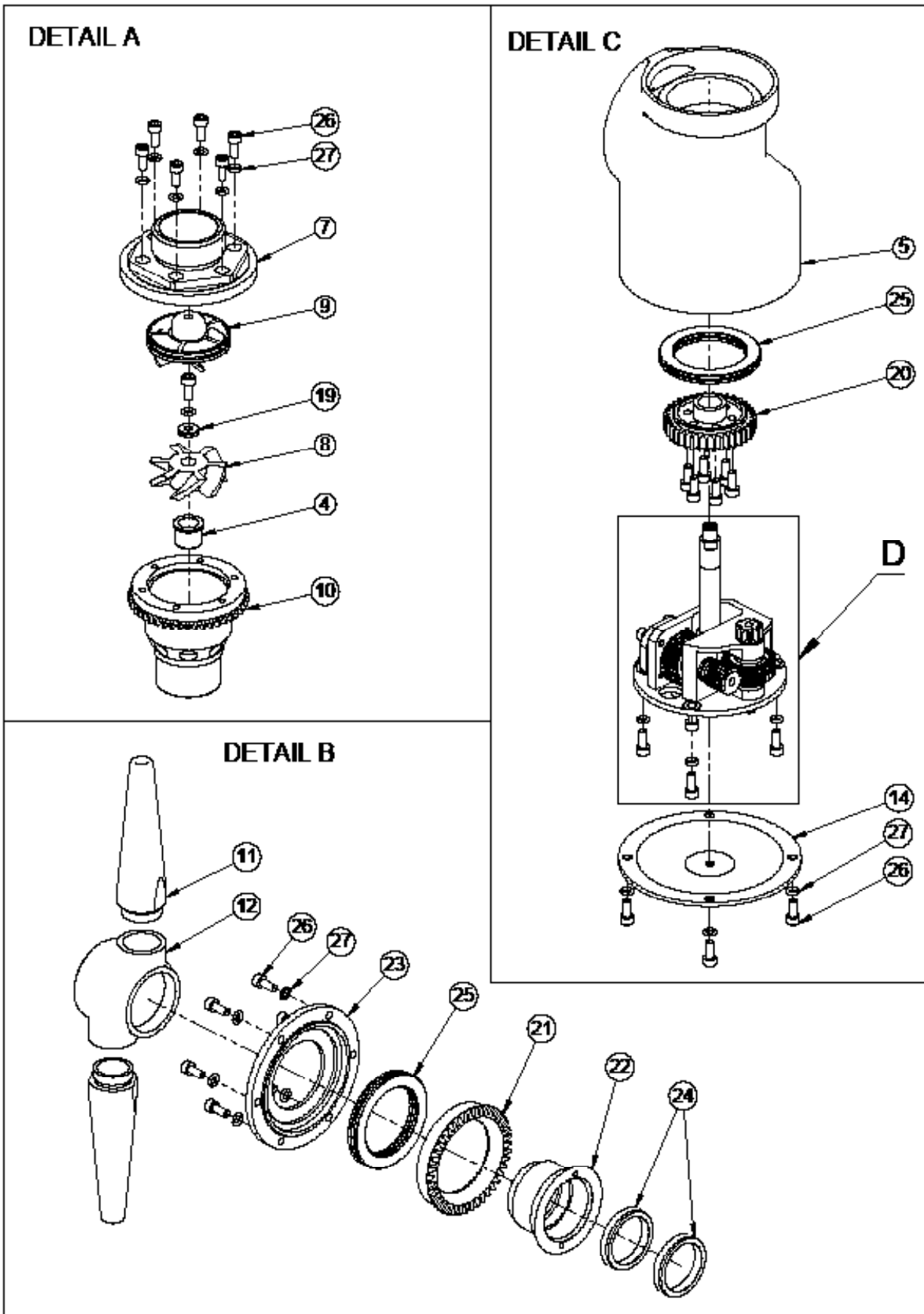
Opt.- B	5389706	Flange Attachment	1 Set
a	5380719	Coupling 1½" BSPP	1
b	5383502	Extension Pipe 1½" BSPPx2 Ft	1
c	5382716	Flange 150# 1½" BSPP-(F)	1

### Exploded View for TC-110J

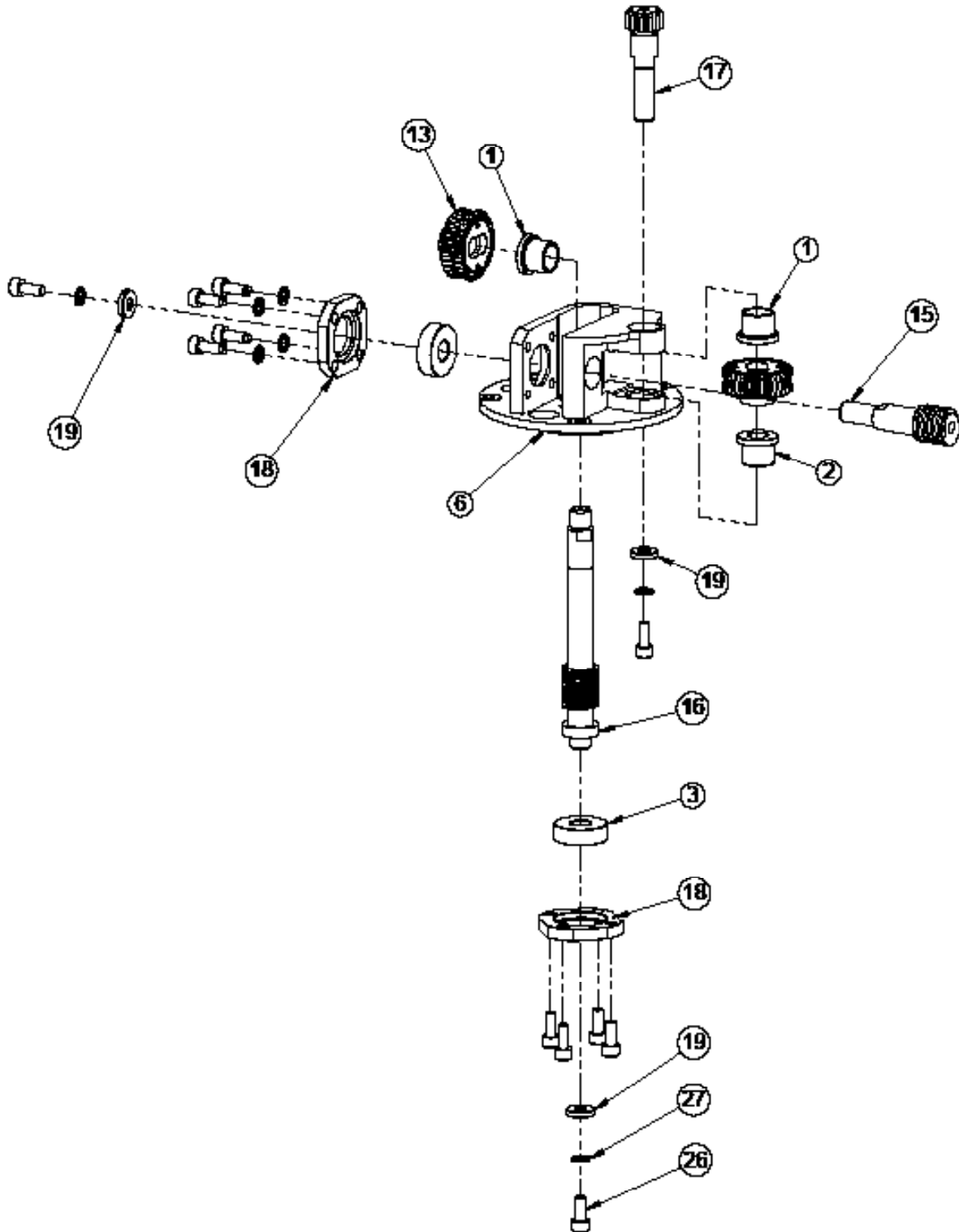




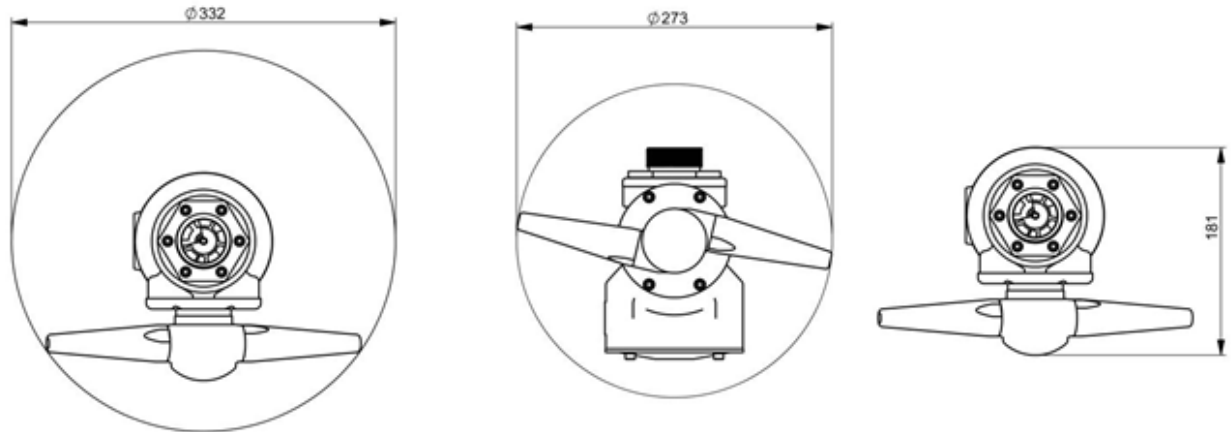
### Exploded View Detail A and Detail C for TC-110J



### Exploded View for TC-110J Gear Wheel Assembly D



## Dimensional Data



## Repair Kits

Illu. No.	Part No.	Description	538 97 05
1	538 04 01	Collar Bush-1	2
2	538 04 02	Collar Bush-2	1
3	538 04 03	Slide Bearing	2
4	538 04 04	Main Bush	1
22	538 27 09	Hub Conical Part	1
24	538 36 01	Lip Seal	2
25	538 50 01	Bearing	2
28	538 82 01	Strainer	1
29	210 90 24S	Int. Circlip	1

## Nozzle Table

Illu. No.	Part No.	Description	Qty
11	TC110-023N06	Nozzle 6mm Set (Optional)	1
11	TC110-023N07	Nozzle 7mm Set (Optional)	1
11	TC110-023N08	Nozzle 8mm Set (Standard)	1
11	TC110-023N09	Nozzle 9mm Set (Optional)	1
11	TC110-023N10	Nozzle 10mm Set (Optional)	1

## EU DECLARATION OF CONFORMITY

We hereby certify that the Listed Product stipulated below comply with all relevant provisions of the machinery directive (2006/42/EC) and the national laws and regulations adopting this directive.

**Description** : Tank Cleaning Jet Machine (6~10mm)

**Model Number** : TC-110J

**Is in conformity with the provisions of the following European Directives: (2006/42/EC) Machinery Safety and Harmonized standards**

**ISO 12100-1: 2010: Safety of Machinery –general Principles for Design –Risk Assessment and Risk Reduction.**

**Registered Office** : 416 Gundecha Industrial Complex, Akuril Road,  
Kandivali East, Mumbai – 400101, Maharashtra, India.

**Web site** : www.teryair.com

**Works** : A-1, Tirupati Udyog Nagar, Sativali Road, Vasai East,  
Palghar – 401208, Maharashtra, India.

CE certification registration no – C E 16831

Issued by – BMQR Certifications Pvt Ltd.  
www.cemarking-india.com

Valid Till – 03/11/2025

Signed for and on behalf of



TERYAIR EQUIPMENT PVT. LTD.

Place of Issue : Vasai



# Warranty Certificate

Every product manufactured by Teryair  
is built to meet the highest standards of quality.

Teryair warrants that the Products, accessories and parts manufactured or supplied by the company be free from defects in material and workmanship for a period of six months from date of Teryair authorized dealer invoice to customer, or one year from date of Teryair invoice to dealer, whichever is earlier. Failure due to normal wear, misapplication, or abuse is, of course, excluded from this warranty.

Since the use of Teryair products and parts is beyond our control, Teryair cannot guarantee the suitability of any product or part for a particular application and Teryair shall not be liable for any consequential damage or expense arising from the use or misuse of its products on any application. Teryair does not warranty bought out products or components such as electric motors and hardware but will assist in directing warranty queries to the dealer/manufacturer responsible. Teryair responsibility is limited solely to replacement or repair of defective Teryair products or components.

Dealer/End User shall have no right or remedy and Teryair shall have no liability or obligation under the warranty, if: (i) a Product is altered, changed, modified or tampered with in any way; (ii) a Product is damaged after deposit with the transporter for shipment; (iii) a Product is not properly preserved, packaged, stored, processed or handled after receipt; (iv) a Product is not used and maintained in accordance with Teryair's recommended operating and maintenance manuals, instructions and procedures, if any; (v) a Product is not properly incorporated or installed in, or not properly combined with, an Other Product; (vi) the issue with a Product is directly or indirectly attributable to, or directly or indirectly results from or arises out of, a failure, substandard performance or other issue with another product, material, component or part not supplied by Teryair; (vii) the issue with a Product is directly or indirectly attributable to, or directly or indirectly results from or arises out of, compliance with any design, specification or other specific requirement of Dealer/End User; (viii) a Product is used in a manner, with a substance or for a purpose other than the normal manner, substance and purpose for which it is intended or is otherwise subjected to abnormal use or service; (ix) a Product is subjected to a power surge, brown out or other similar occurrence; (x) the issue with a Product is directly or indirectly attributable to, or directly or indirectly results from or arises out of, normal wear and tear of such Product (including, without limitation, things such as worn seals, diaphragms, balls, O rings, gaskets, chisels, cutters, hoses and other such wearing components); (xi) the issue with a Product is directly or indirectly.

Model Number : TC-110J

A handwritten signature in blue ink, appearing to read "M. Yadav", is written over a horizontal line.

M Yadav, Q.A. Manager  
(Company Seal)

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