

Service instructions

MTH 2 and 4

MTC 2 and 4

Model A

50/60 Hz

3~

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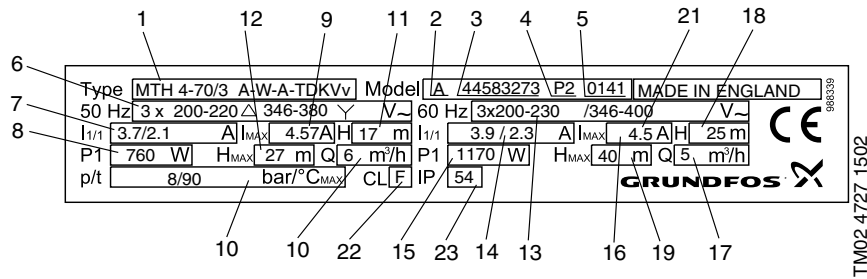
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1. Type identification

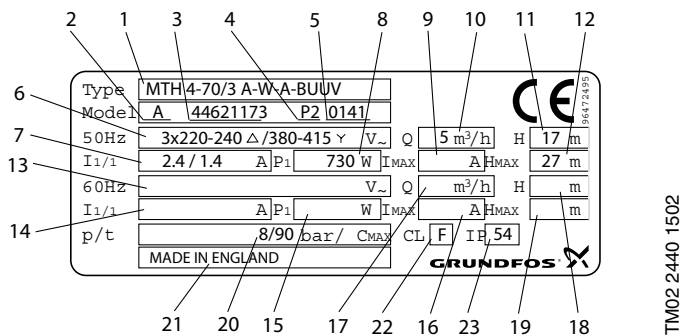
This section shows the type key, the nameplate and the codes that can appear in the variant code.

1.1 Nameplate MTH/MTC 2 and 4

Japan:



Other countries:



Pos.	Description	Pos.	Description
1	Type designation, see section 1.2 Type key .	13	Voltage, 60 Hz
2	Model	14	Current, 60 Hz
3	Product number	15	Power input P1, 60 Hz
4	Place of production	16	Max. current, 60 Hz
5	Production year and week	17	Rated flow rate, 60 Hz
6	Voltage, 50 Hz	18	Head at rated flow rate, 60 Hz
7	Current, 50 Hz	19	Max. head, 60 Hz
8	Power input P1, 50 Hz	20	Max. pressure at stated temperature
9	Max. current, 50 Hz	21	Country of production
10	Rated flow rate, 50 Hz	22	Insulation class (IEC 85)
11	Head at rated flow rate, 50 Hz	23	Enclosure class (IEC 34-5)
12	Max. head, 50 Hz		

1.2 Type key

Example	MTH	4	-	70	/3	X-	X-	X-	XXXX
Type range									
Rated flow rate in m ³ /h									
Number of chambers x 10									
Number of impellers									
Code for pump version A = basic version U = Nema version									
Code for pipe connection W = internal thread									
Code for pump materials A = Pump head: cast iron Other wetted parts: stainless steel DIN W.-No. 1.4301									
Code for shaft seal BUUV = Rubber bellows seal; rotating face: tungsten carbide; stationary seat: tungsten carbide; O-rings: FKM TDNV = Gab seal, rotating face (pump shaft): steel; stationary seat (bush): bronze; O-ring: FKM									

2. Torques and lubricants

This section shows the screws and nuts that must be tightened to a certain torque and the lubricants to be used.

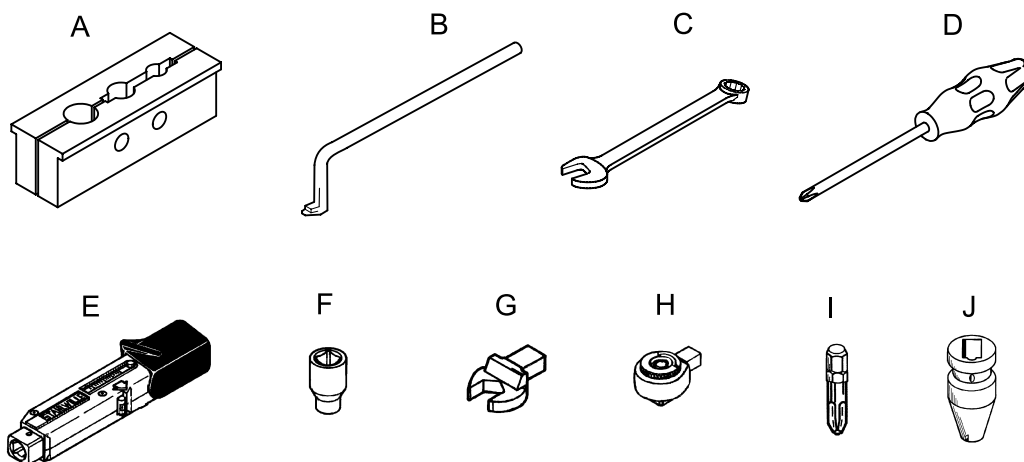
Pos.	Description	Number	Dim.	Torque [Nm]	Lubricant
28	Screw	4	M6	8-10	Thread-Eze
36	Nut	3	M6	10-12	Thread-Eze
67	Lock nut	1	M8	10-12	Gardolube L 6034
84b	Screw	1	M4	2	Gardolube L 6034
150a	Stator with housing (flange)	1			Thread-Eze

Thread-Eze, part no. SV9997 (0.5 l).

Gardolube L 6034, part no. SV9995 (1 l).

3. Service tools

The following drawings and tables show special, standard and torque tools for pump service.



3.1 Special tools

Pos.	Description	For pos.	Suppl. information	Part no.
A	Shaft holder for assembly			SV0040
B	Puller	65		SV0239

3.2 Standard tools

Pos.	Description	For pos.	Suppl. information	Part no.
C	Ring/open-end spanner	36	M6 - 10 mm	SV0083
		67	M8 - 13 mm	SV0055
D	Screwdriver for cross-head-screw	28	No. 3	SV0194

3.3 Torque tools

Pos.	Description	For pos.	Suppl. information	Part no.
E	Torque wrench	G-H	4-20 Nm 9 x 12	SV0292
F	Socket spanner	H-67	M8 - 13 mm ½" x ½"	SV0413
G	Open-end spanner	E-36	M6 - 10 mm 9 x 12	SV0610
H	Ratchet insert tool	E-F-J	9 x 12 -> ½" x ½"	SV0295
I	Screwdriver for cross-head-screw	J-28	PCD 3 ¼" x ¼"	SV0450
J	Adapter	H-I	½" x ½" -> ¼" x ¼"	SV0343

4. Dismantling and assembly

4.1 General

The GRUNDFOS centrifugal pumps type MTH/MTC 2 and MTH/MTC 4 are multistage pumps with spline shaft.

If it is necessary to dismantle the pump, either because it is choked or damaged, please follow the instructions in the following sections.

Position numbers of parts (digits) refer to exploded views, sectional drawings and parts lists; position numbers of tools (letters) refer to section [3. Service tools](#).

4.1.1 Before dismantling

- Disconnect the electricity supply to the motor.
- Remove the discharge pipe.
- *Remove the electric cable in accordance with local regulations.*
- Remove the screws holding the pump to a possible condensate tank. Remove the pump.

4.1.2 Before assembly

- Clean and check all parts.
- Order the necessary service kits.
- Replace defective parts by new parts.
- Gaskets and O-rings should always be replaced when the pump is overhauled.

4.1.3 During assembly

- Lubricate and tighten screws and nuts to correct torque as stated in section [2. Torques and lubricants](#).

4.1.4 After assembly

- The head and flow should be tested according to the test specifications below:

	Gab seal (TDNV)	Rubber bellows seal (BUUV)
MTH/MTC 2	430073	430079
MTH/MTC 4	440165	440170

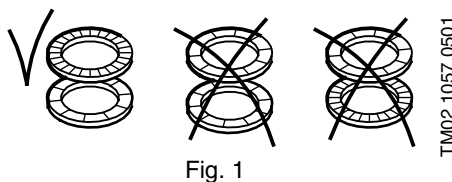
4.2 Replacement of hydraulic parts

4.2.1 Dismantling

1. Slacken the screws pos. 152 and remove them together with the fan cover pos. 151.
2. Remove the fan pos. 156 using a puller. It may be necessary to insert two screwdrivers under the fan to remove it from the shaft.
3. Place the shaft holder for assembly [pos. A](#) in a vice and position the rotor shaft in the shaft holder. Tighten the vice so that it holds the pump.
4. Remove the nuts pos. 36, the washers pos. 66a and the straps pos. 26.
5. Slacken the screw pos. 84b and remove it together with the washer pos. 84c, the strainer pos. 84 and the retainer for strainer complete pos. 121.
6. Slacken and remove the nut pos. 67 together with the washer pos. 66.
7. Continue the dismantling up to the spacing pipe pos. 64/69 according to section [5. Order of assembly for chambers and impellers](#).
8. Remove the gasket pos. 37 and the spacing pipe pos. 69a (pumps with TDNV seal only).

4.2.2 Assembly

1. Place the gasket pos. 37 on the recess of the pump head pos. 2. Place the spacing pipe pos. 69a (pumps with TDNV seal only).
2. Assemble the pump from the top towards the bottom according to section [5. Order of assembly for chambers and impellers](#).
 - When fitting the priming screw pos. 122 the small ring of the priming screw must point towards the impeller.
 - *The washer pos. 66 consists of two washers glued together. If they have been separated, make sure that they are fitted correctly, see [fig. 1](#)*



- Tighten the lock nut pos. 67 to the correct torque.
 - Turn the retainer for strainer complete pos. 121 so that the slots for the straps are aligned to the points where the straps attach to the pump head.
3. Fit the straps pos. 26, the washers pos. 66a and the nuts pos. 36.
 4. Hold the straps to the pump and tighten the nuts diagonally to the correct torque.
 5. Slacken the vice and lift the pump off the shaft holder.
 6. Fit the stator with housing if it has been removed, see section [4.4.2 Assembly](#).
 7. Support the pump shaft when the fan pos. 156 is driven home on the rotor shaft in order not to damage the ball bearings.
 8. Check the pump by turning the fan.
 9. Fit the fan cover pos. 151 to the motor. Fit and tighten the screws pos. 152.
 10. Fit the strainer pos. 84, the spring washer pos. 84c and the screw pos. 84b.

4.3 Replacement of shaft seal

4.3.1 Dismantling

4.3.1.1 TDNV type (gab seal)

1. Remove the chamber stack, see section [4.2.1 Dismantling](#).
2. Remove the spacer for shaft seal pos. 112.
3. Remove the retaining ring pos. 47d by pushing it up by means of a screwdriver.
4. Remove the bush pos. 47c and the O-ring pos. 107.

4.3.1.2 BUUV type

1. Remove the chamber stack, see section [4.2.1 Dismantling](#).
2. Remove the spacer for shaft seal pos. 112.
3. Remove the rotating part of the shaft seal pos. 105.
4. Push the stop ring pos. 62 free of the recess and pull it off the shaft. The stop ring cannot be reused.
5. Slacken and remove the screws pos. 28.
6. Lift the pump head pos. 2 off the motor.
The bearing cover plate pos. 155 and the diverting disc pos. 79 may stick to the pump head. If this is the case, remove these parts from the pump head.
7. Press the stationary seal ring and the O-ring out of the pump head from the motor side.

4.3.2 Assembly

4.3.2.1 TDNV type (gab seal)

1. Fit the O-ring pos. 107 against the collar of the bush pos. 47c.
2. Fit the bush on the shaft. The two taps must engage with the notches in the pump head. Press the bush home in the pump head.
3. Secure the bush with the retaining ring pos. 47d. Make sure it fits properly in the groove.
4. Make sure that the stop ring pos. 62 is fitted in the groove.
5. Fit the spacer pos. 112. The two notches must be against the seal.
6. Assemble the chamber stack, see section [4.2.2 Assembly](#).

4.3.2.2 BUUV type

The seal rings must be intact, and the seal faces must be smooth and clean.

Do not expose the seal rings to blows or knocks.

1. Fit the bearing cover plate pos. 155 to the shaft so that it touches *the outer ring of the ball bearing*. The curved side of the bearing cover plate must point away from the ball bearing.
2. Fit the diverting disc pos. 79 to the pump shaft and push it until it touches the rotor shaft.
3. Lubricate the flange of the stator housing to which the pump head is fitted.
4. Moisten the stationary seal ring with O-ring with water and press it into the recess of the pump head. The O-ring must point to the motor.
5. Fit the pump head pos. 2 and press it home on the recess of the stator housing.
If it is not possible to press home the pump head, check whether the corrugated spring pos. 158 is positioned correctly. See sectional drawing.
6. Turn the pump head pos. 2 so that the discharge port and the terminal box point in the same direction as before dismantling. Fit the screws pos. 28 and tighten diagonally.
7. Fit the stop ring pos. 62 to the shaft so that it engages with the recess of the shaft.
8. Fit the rotating shaft seal part. The seal face must point towards the stationary seat.
9. Fit the spacer for shaft seal pos. 112. The smallest diameter towards the shaft seal.
10. Assemble the chamber stack, see section [4.2.2 Assembly](#).

4.4 Replacement of stator with housing

4.4.1 Dismantling

1. Slacken and remove the screws pos. 152. Pull the fan cover pos. 151 free of the housing.
2. Push the fan pos. 156 off the shaft using a puller. It may be necessary to insert two screwdrivers under the fan to remove it.
3. Slacken and remove the screws pos. 28.
4. Loosen the stator with housing with a light blow of a rubber mallet and pull it free of the pump.
Take care not to damage the windings in the stator.

4.4.2 Assembly

1. Stand the stator with housing pos. 150a upright with the flange pointing upwards.
2. Press the O-ring pos. 159 home in the recess of the stator. Fit the corrugated spring pos. 158.
3. Lubricate the flange of the stator housing to which the pump head is fitted.
4. Fit the rotor shaft with bearing pos. 154 in the stator housing. Take care that the end of the rotor shaft can pass freely through the stator housing when the pump body with rotor shaft is fitted in the stator housing.
5. Turn the pump head pos. 2 so that the discharge port and the terminal box point in the same direction as before dismantling. Fit the screws pos. 28 and tighten diagonally.
6. Remove the strainer pos. 84 and support the pump shaft when the fan pos. 156 is driven home on the rotor shaft in order not to damage the ball bearings.
7. Check the pump by turning the fan.
8. Fit the fan cover pos. 151 to the motor. Fit and tighten the screws pos. 152.
9. Fit the strainer pos. 84, the spring washer pos. 84c and the screw pos. 84b.

4.5 Replacement of pump-motor shaft complete

4.5.1 Dismantling

1. Remove the stator with housing complete, see section [4.4 Replacement of stator with housing](#).
2. Remove the hydraulic parts, see section [4.2 Replacement of hydraulic parts](#).
3. Remove the shaft seal, see section [4.3 Replacement of shaft seal](#).
4. Remove the pump-motor shaft complete from the pump head.
5. Remove the diverting disc pos. 79 and the bearing cover pos. 155.
6. Clean and check the bearing seats.

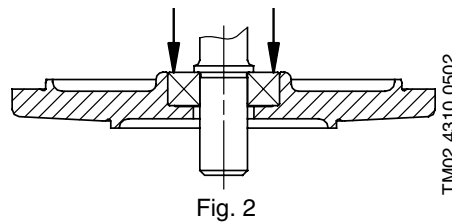
The dimensions of bearing seats and the shaft end must be within close tolerances. Blasting with glass or sand for cleaning will damage these parts.

Many Grundfos components are electrocoated for corrosion protection. The coat of paint is so thick, that bearing seat dimensions will be changed if the paint is cleaned off the bearing seat.

4.5.2 Assembly

Bearings are precision-machined elements that are very sensitive to dirt, dust, damaged bearing seats, and knocks during mounting.

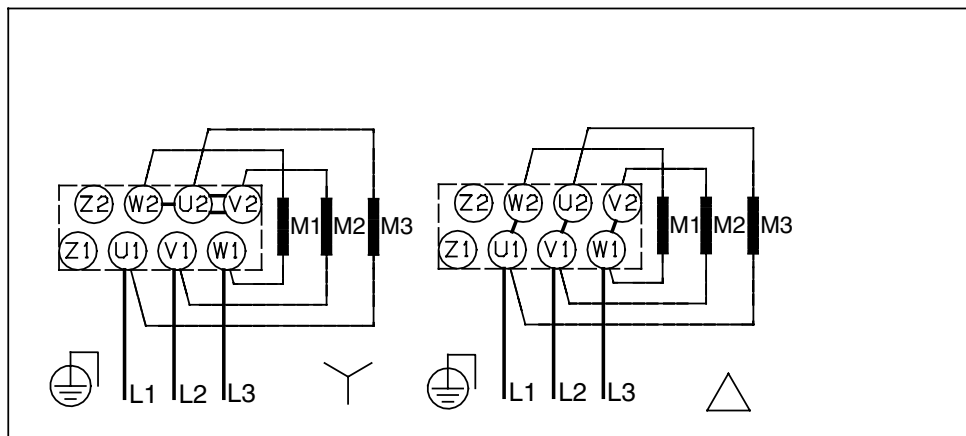
1. Fit the bearing cover plate pos. 155 to the shaft so that it touches *the outer ring of the ball bearing*. The curved side of the bearing cover plate must point away from the ball bearing.
2. Fit the pump-motor shaft with bearing pos. 153 in the pump head. It is recommended to heat the flange to approx. 80° C so that the bearing seat can expand and the bearing be easily and securely fitted. If it is necessary to press the bearing home in the pump head, the force must be applied to the outer ring. See [fig. 2](#).



3. Fit the diverting disc pos. 79 to the pump shaft and push it until it touches the rotor shaft.
4. Fit the shaft seal, see section [4.3.2 Assembly](#).
5. Fit the pump parts, see section [4.2.2 Assembly](#).
6. Fit the stator with housing complete, see section [4.4.2 Assembly](#).
Take care not to damage the stator windings.

4.6 Checking and replacement of parts

Checking	Replacement
Impeller and neck ring	
<ul style="list-style-type: none"> • Check whether it is necessary to replace impeller due to friction between the neck ring and the impeller skirt. <p>If wear has caused a noticeable (use a finger nail) groove in the impeller skirt, the impeller should be replaced.</p> <p>Neck rings and retainers for neck rings should always be replaced when the chamber stack is dismantled.</p>	<p style="text-align: center;">Neck ring/retainer for neck ring</p> <ol style="list-style-type: none"> 1. Prize the retainer for neck ring pos. 65 up and free of the chamber using the puller pos. B. 2. Remove the neck ring pos. 45. 3. Place a new neck ring on the chamber. 4. Press a new retainer for neck ring down on the neck ring so that it engages with the chamber. <p><i>It must be possible to move the neck ring freely (sideways) between the retainer and the chamber.</i></p>
Bearing rings	
<ul style="list-style-type: none"> • The permissible maximum difference between the diameters of the bearing ring pos. 47a and the bearing ring in the chamber pos. 4a is 0.4 mm. • Check if there is a visible and noticeable (use a finger nail) edge on the rotating bearing ring. 	<ul style="list-style-type: none"> • Both bearing ring pos. 47a and chamber with bearing ring pos. 4a should be replaced at the same time.
Stator with housing	
<ul style="list-style-type: none"> • Check the winding resistance in the three set of windings by means of an ohmmeter. • Measuring points, see fig. 3. • Measuring values, see parts list pos. 150. 	<ul style="list-style-type: none"> • In case the measured value is outside $\pm 10\%$ of the nominal value, the stator with housing should be replaced. See section 4.4 Replacement of stator with housing.

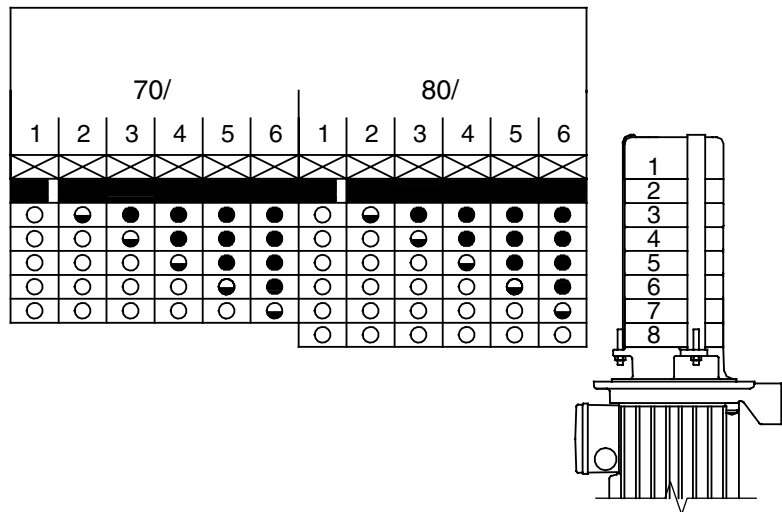
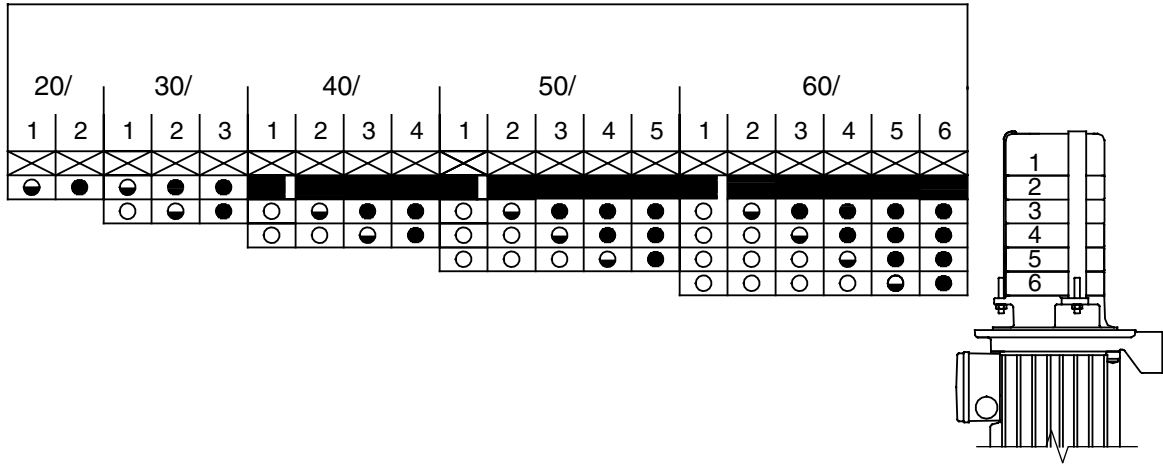


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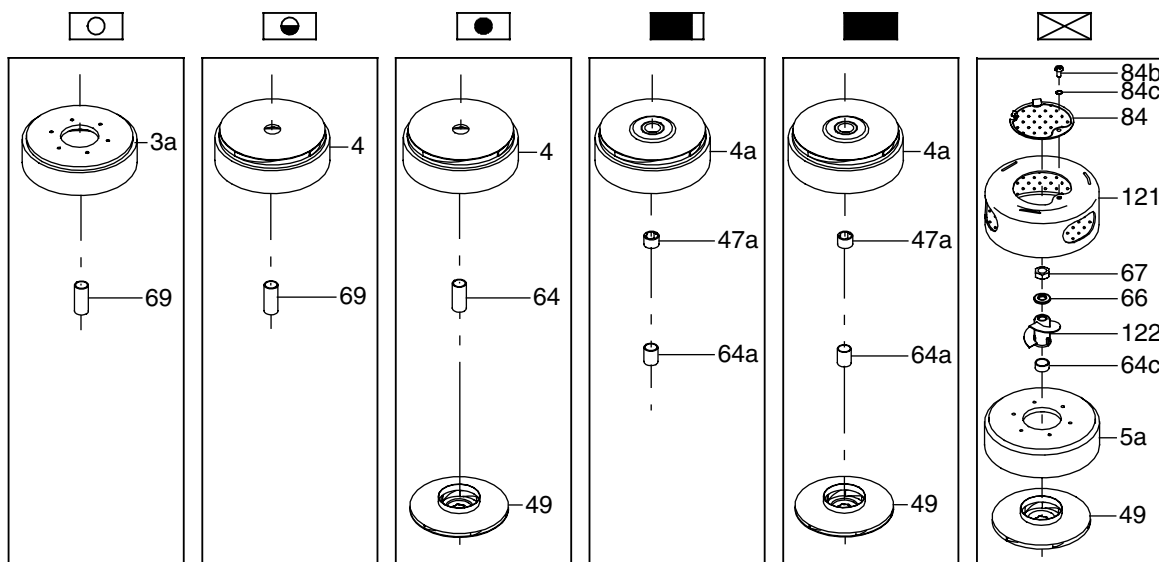
Fig. 3

5.2 MTH/MTC 4

Stage survey



Symbol survey



TM01 9153 1901