

Service instructions

MTR 1, 3 and 5

50/60 Hz

1/3~



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1. Type identification

1.1 Nameplate

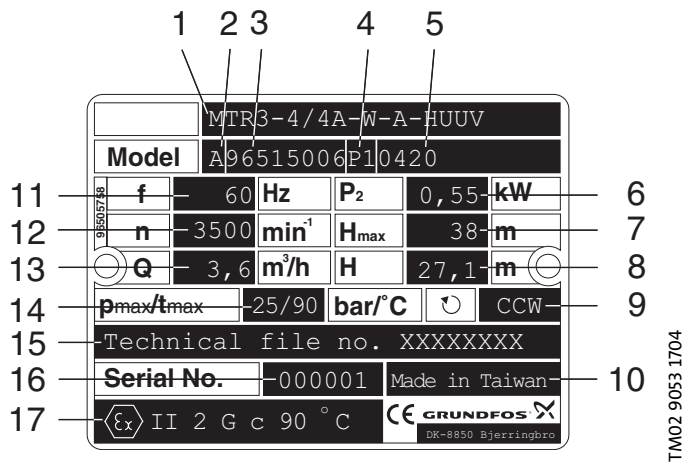


Fig. 1. Nameplate with 60 Hz data

Pos.	Description	Pos.	Description
1	Type designation	10	Country of production
2	Model	11	Frequency
3	Product number	12	Speed
4	Place of production	13	Rated flow rate
5	Production year and week	14	Maximum pressure and temperature
6	P_2	15	The number of the copy of the technical file kept with KEMA (stated if the pump is ATEX classified)
7	Closed valve head, 50 Hz	16	The serial number of the pump (stated if the pump is ATEX classified)
8	Head at rated flow rate, 50 Hz	17	ATEX category (stated if the pump is ATEX classified)
9	Direction of rotation CCW: Counter-clockwise CW: Clockwise		

1.2 Type key

Example	MTR	3	-4	/ 4	A	-W	-A	-HUUV
Type range								
Rated flow rate m ³ /h								
Number of stages								
Number of impellers in the pump								
Code for pump version								
A = Basic version								
B = Oversize motor								
P = Undersize adapter flange (one flange size smaller)								
T = Oversize adapter flange (two flange sizes bigger)								
X = Special version								
Code for pipe connections								
M = Changed flange connection								
W = Internally threaded								
Code for materials								
A = Standard								
I = Stainless steel parts of DIN W.-Nr. 1.4301 / AISI 304 or similar class								
Code for shaft seal, see 1.3 Code for shaft seal .								

1.3 Code for shaft seal

The code for shaft seal always consists of four letters.

Example	H	U	U	V
Principal Grundfos type designation for shaft seal	1			
Material, rotating seal face	2			
Material, stationary seat	3			
Material, secondary seal	4			

The following codes are used:

Position	Code	Description
1	A	O-ring seal with fixed driver
	B	Rubber bellows seal
	C	O-ring seal with spring as seal driver
	D	O-ring seal, balanced
	E	Cartridge seal with O-ring
	F	Cartridge seal with rubber bellows
	H	Balanced cartridge seal with O-ring
	K	Type M as cartridge seal
	M	Shaft seal with metal bellows
	O	Double seal, back-to-back
	P	Double seal, tandem
	R	O-ring seal, type A, with reduced sliding surfaces
	X	Special version
2 and 3	B	Carbon, synthetic resin-impregnated
	C	Other types of carbon
	S	Chromium steel
	H	Cemented tungsten carbide, embedded (hybrid)
	U	Cemented tungsten carbide
	Q	Silicon carbide
	V	Aluminium oxide
X	Other ceramics	
4	E	EPDM
	F	FXM
	P	NBR (nitrile rubber)
	T	PFTE
	V	FKM
K	FFKM	

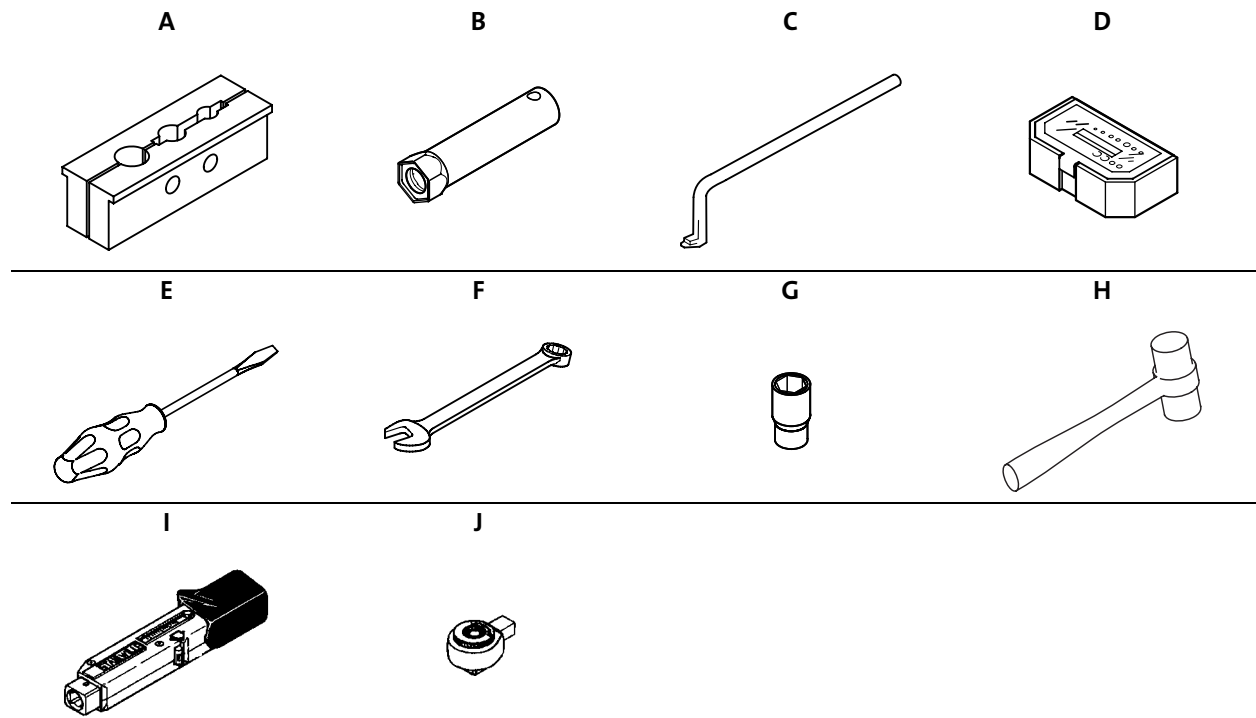
2. Torques and lubricants

Pos.	Designation	Quantity	Dim.	Torque [Nm]	Lubricant	
7.a	Screw	4	M4	3 ± 0.25	-	
9	Hexagon socket head screw	4	M6	13 ± 1.5	Thread-Eze	
			M8	31 ± 3		
			M10	62 ± 6		
36	Nut for strap	2	M8	18 ± 1	Gardolube	
			4	M10		20 ± 4
				M12		50 ± 5
36a	Nut	4	M6	5 ± 1	Thread-Eze	
			M8	12 ± 2		
			M12	30 ± 3		
			M16	40 ± 8		
67	Lock nut	1	M8	12 ± 2	Gardolube	
			M12	40 ± 8		
84b	Screw for filter	1	M4	3 ± 0.25	-	
105	Shaft seal	1	M28	35 ± 7	Soapy water	
113	Set screw	3	M5	2.5 ± 0.25	-	

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

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

3. Service tools



3.1 Special tools

Pos.	Designation	For pos.	Description	Part number
A	Shaft holder for assembly			SV0040
B	Box spanner for shaft seal	105		SV2007
C	Puller for neck ring	65		SV0239

3.2 Standard tools

Pos.	Designation	For pos.	Description	Part number
D	Bits kit	9, 113		SV2010
E	Screwdriver	105, 84b 7a	Straight slot	-
			Torx TX20	-
F	Ring/open-end spanner	28, 36, 67	M6 - 10 mm	SV0083
			M8 - 13 mm	SV0055
			M12 - 19 mm	SV0054
			M16 - 24 mm	SV0122
G	Socket	28, 36, 67	M6 - 10 mm	SV0806
			M8 - 13 mm	SV0091
			M12 - 19 mm	SV0267
			M16 - 24 mm	SV0092
H	Plastic hammer		No. 2	SV0349

3.3 Torque tools

Pos.	Designation	For pos.	Description	Part number
I	Torque wrench	9, 26b, 28a, 36, 67, 105, 113	1-6 Nm	SV0438
			4-20 Nm	SV0292
			20-100 Nm	SV0269
J	Ratchet insert tool	I	9 x 12, ½" x ½"	SV0295

4. Dismantling and assembly

Position numbers

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

Before dismantling

- Disconnect the electricity supply to the motor.
- Close the isolating valves, if fitted, to avoid draining the system.
- Remove the electric cable in accordance with local regulations.
- Note the centre of gravity of the pump to prevent it from overturning. This is especially important in the case of long pumps.

Before assembly

Gaskets and O-rings should always be replaced when the pump is overhauled.

- Clean and check all parts.
- Order the necessary service kits.
- Replace defective parts by new parts.

During assembly

- Lubricate and tighten screws and nuts to the torque stated, see [2. Torques and lubricants](#).

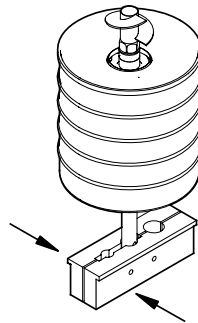
4.1 Dismantling the pump

4.1.1 Removing the motor, coupling and shaft seal

1. Remove the screws pos. 7a together with the coupling guards pos. 7.
2. Remove the screws pos. 9 together with the coupling halves pos. 10a and the shaft pin pos. 10.
3. Remove the screws pos. 28.
4. Lift the motor off the pump head pos. 2.
5. Slacken the three screws of the shaft seal pos. 113 by approx. $\frac{1}{4}$ of a turn.
6. Slacken the shaft seal pos. 105 using the box spanner for shaft seal [pos. B](#) until the thread is completely free of the pump head.
7. Pull the shaft seal off the shaft.

4.1.2 Dismantling the chamber stack

1. Remove motor, coupling and shaft seal, see [4.1.1 Removing the motor, coupling and shaft seal](#).
2. Place the shaft holder [pos. A](#) in a vice, but do not tighten the vice.
3. Remove the nuts pos. 36 together with the washers pos. 66a.
4. Remove the straps pos 26a, retainer for strainer pos. 121 and the bottom chamber pos. 5a.
5. Loosen the chamber stack with a light blow and pull it off.
6. Fit the shaft pin pos. 10 into the shaft pin hole, place the chamber stack in the shaft holder [pos. A](#) and tighten the vice.



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Fig. 2 Fitting the chamber stack in the holder

7. Remove the nut pos. 67, washer pos. 66, priming screw pos. 122 and splined clamp pos. 64c.
8. Remove the chamber stack parts: impellers, spacing pipes, chambers and bearing rings.
9. If the neck rings pos. 45 in the chambers are worn, remove them by pressing off the retainer for neck rings using the puller for neck ring [pos. C](#).
10. Remove the gasket pos. 37.

4.2 Assembly

4.2.1 Assembling the chamber stack

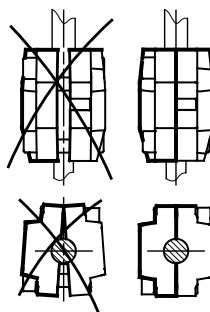
1. Fit the neck rings into the chambers pos. 45 if removed.
2. Place the shaft holder [pos. A](#) in a vice, but do not tighten the vice.
3. Fit the shaft pin pos. 10 into the shaft pin hole, place the shaft in the shaft holder and tighten the vice.
4. Fit the chamber stack parts on the shaft: chamber, spacing pipe, impeller and bearing ring, see [5. Order of assembly for chambers and impellers](#).

Note: When fitting the chamber stack, make sure that bearings and other rotating parts are not dropped on the shaft. They must be slid carefully over the shaft to prevent any damage to bearings.

5. Fit the splined clamp pos. 64c, priming screw pos. 122, washer pos. 66 and nut pos. 67 and tighten to the torque stated, see [2. Torques and lubricants](#).
6. Fit the gasket pos. 37.
7. Slacken the vice and fit the chamber stack on the pump head pos. 2.
8. Fit the bottom chamber pos. 5a, retainer for strainer pos. 121 and straps pos. 26a.
Note: The holes for the straps in the retainer for strainer are positioned asymmetrically.
9. Fit the washers pos. 66a and nuts pos. 36, fixing the straps to the pump head.
10. Check that the straps are straight (parallel with the shaft), and tighten the screws alternately to ensure that the chamber stack is clamped straight.
Tighten to the torque stated, see [2. Torques and lubricants](#).

4.2.2 Fitting the shaft seal, coupling and motor

1. Assemble the chamber stack, see [4.2.1 Assembling the chamber stack](#).
2. If necessary, clean and smooth the shaft end using the holder with emery cloth supplied with the shaft seal kit.
3. Moisten the shaft end with soapy water.
4. Press the shaft seal on the shaft, screw it into the pump head and tighten it with 35 Nm using the box spanner for shaft seal [pos. B](#).
5. Press home the shaft.
6. Press the ring with the three set screws pos. 113 against the hexagon plug.
7. Tighten the screws pos. 113 with 2.5 Nm.
8. Fit the motor to the pump head.
9. Fit the screws pos. 28, lubricate and tighten them diagonally to the torque stated, see [2. Torques and lubricants](#).
10. Fit the pin pos. 10 and the two coupling halves pos. 10a.
11. Lubricate the four screws pos. 9 with Thread-Eze and fit them.
12. Check that the gaps either side of the coupling halves are equal.



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Fig. 3 Gaps between coupling halves

13. Tighten the screws slightly.

14. Insert a suitable screwdriver between the bottom of the coupling and the shaft seal, and raise the shaft/coupling as far as possible.

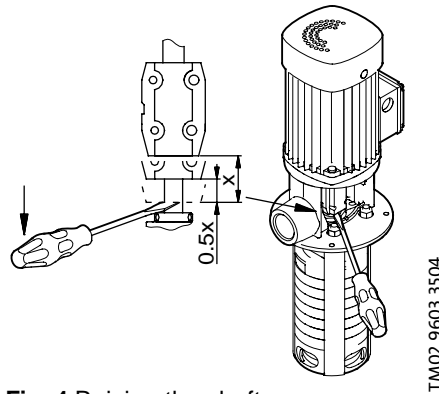


Fig. 4 Raising the shaft.

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15. Lower the shaft/coupling to half the height.
16. Hold the shaft/coupling in this position and tighten the four screws in the coupling pos. 9 diagonally to the torque stated, see [2. Torques and lubricants](#). Check that the gaps either side of the coupling halves are equal, see [fig. 3](#).
17. Check that the shaft rotates freely and noiselessly.
18. Fit the coupling guard pos. 7 and the screws pos. 7a.

4.3 Checking and replacing impellers/wear rings and neck rings

Impellers/wear rings

1. Check whether there is a noticeable groove in the impeller skirts (use a finger nail).
2. If there is a groove, the impellers must be replaced.

Neck rings

The neck rings pos. 65 should always be replaced if the chamber stack has been dismantled.

1. Push the retainer for neck ring free of the chamber using the puller for neck ring [pos. C](#).
2. Remove the neck ring pos. 45.
3. Fit a new neck ring in the chamber.

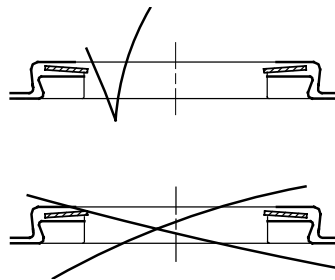


Fig. 5 Correct fitting of neck ring

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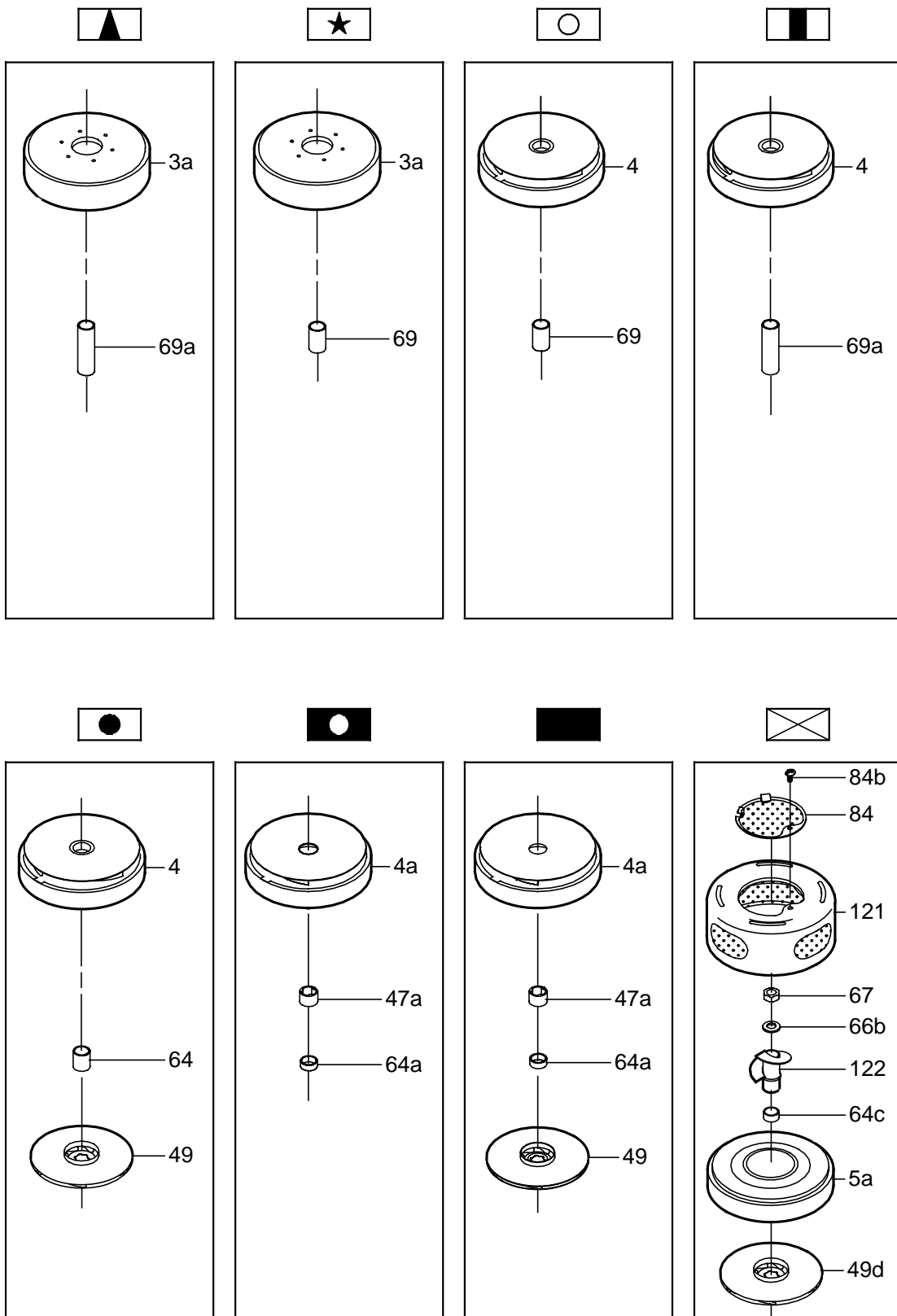
4. Press the retainer for neck ring down on the neck ring and make it engage with the chamber. It must be possible to move the neck ring freely (sideways) between the retainer and the chamber.

Bearing rings

1. Check whether there is a visible or noticeable edge on the rotating bearing rings (use a finger nail).
2. The bearing rings pos. 47a and the chambers with bearing ring pos. 4a must be replaced at the same time.

5. Order of assembly for chambers and impellers

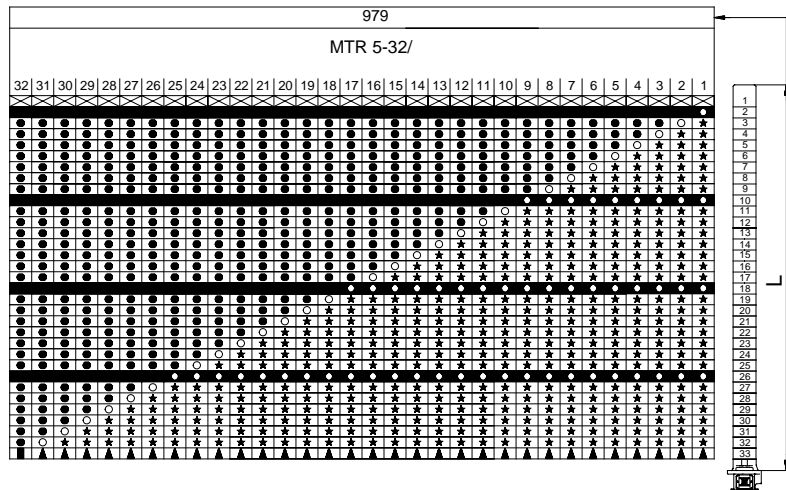
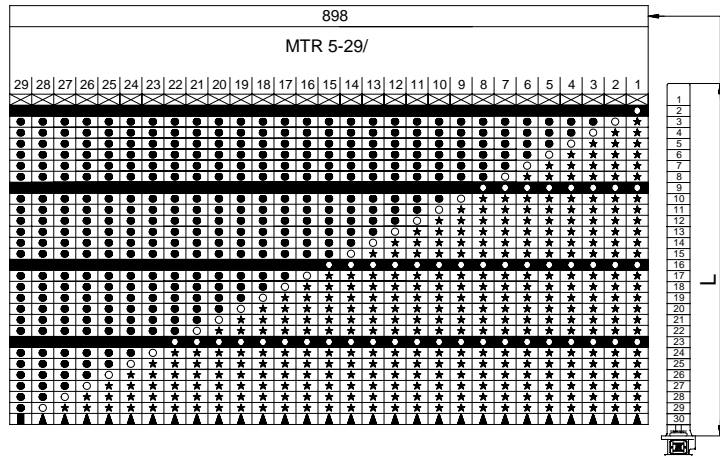
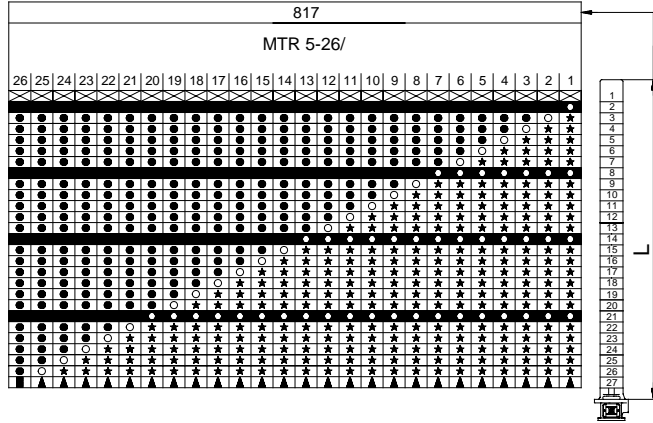
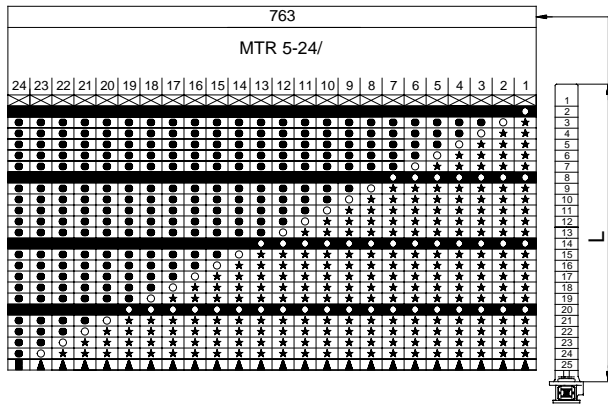
5.1 Overview of chambers



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5.2 Positioning of chambers

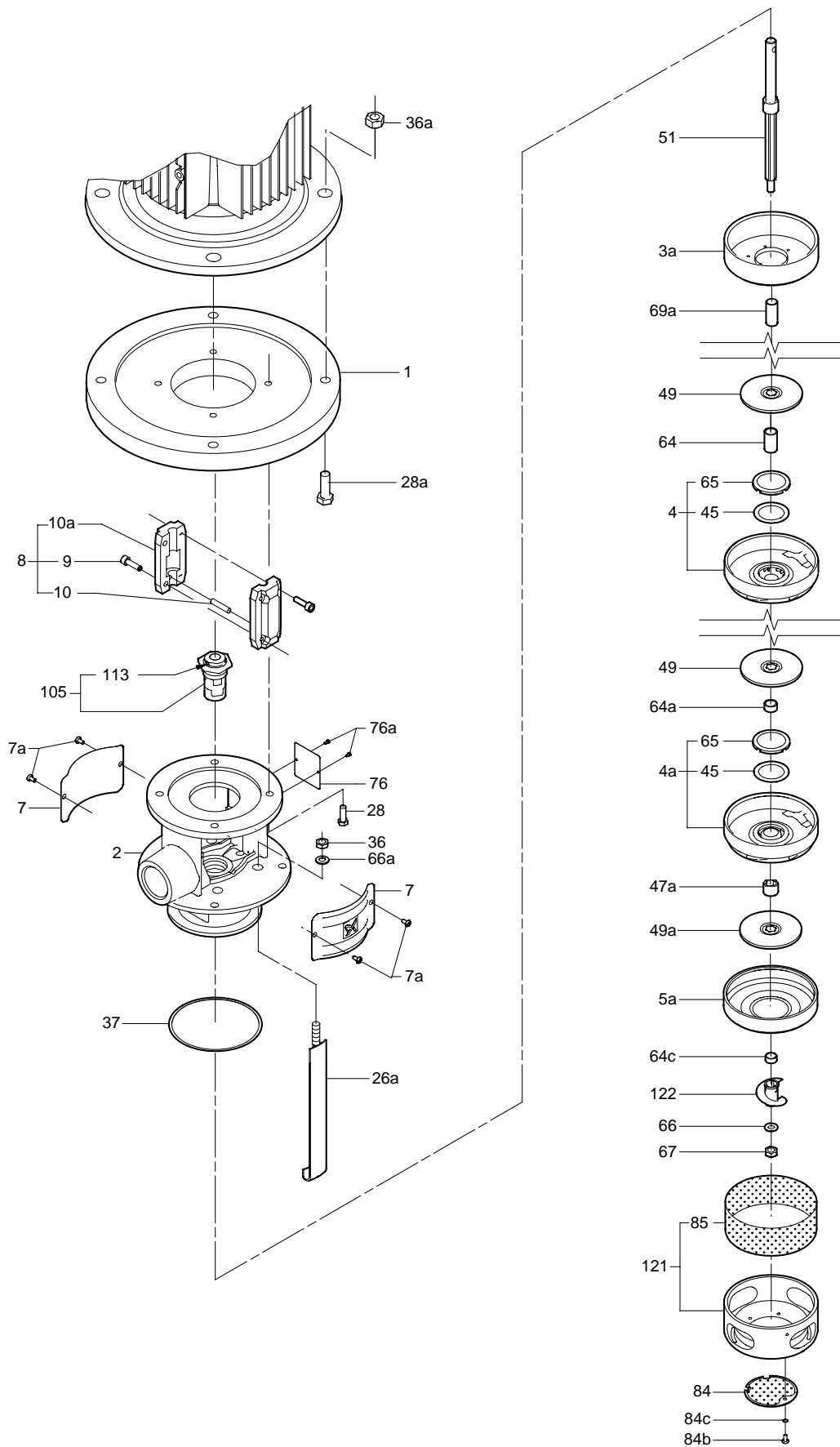




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6. Drawings

Exploded view



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Sectional drawing

