SFG

50/60 Hz DIN/ANSI

Service instructions

Original service instructions.

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1. Symbols used in this document

Warning

If these safety instructions are not observed, it may result in personal injury.

Warning

These instructions must be observed for explosion-proof pumps. We recommend that you also follow these instructions for standard pumps.

Caution ***If these safety instructions are not observed, it may result in malfunction or damage to the equipment.***

Note ***Notes or instructions that make the job easier and ensure safe operation.***

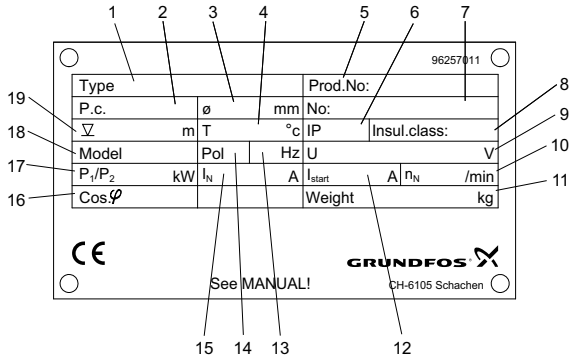
2. Identification

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

Note ***As codes can be combined, a code position may contain more than one code (letter).***

2.1 Nameplate

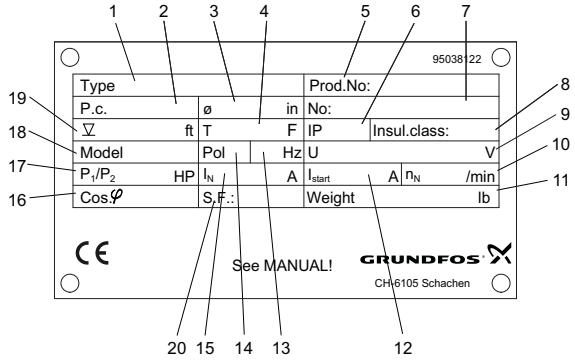
50 and 60 Hz



TM06 2588 4414

Pos.	Description
1	Type designation
2	Production code
3	Propeller diameter
4	Liquid temperature range
5	Product number
6	Enclosure class according to IEC
7	Serial number
8	Insulation class
9	Rated voltage
10	Rated speed (propeller)
11	Weight
12	Starting current
13	Frequency
14	Number of poles
15	Rated current
16	Power factor
17	Motor power P1/P2
18	Model
19	Maximum installation depth

60 Hz ANSI



TM04 9188 3610

Pos.	Description
1	Type designation
2	Production code
3	Propeller diameter
4	Liquid temperature range
5	Product number
6	Enclosure class according to IEC
7	Serial number
8	Insulation class
9	Rated voltage
10	Rated speed (propeller)
11	Weight
12	Starting current
13	Frequency
14	Number of poles
15	Rated current
16	Power factor
17	Motor power P1/P2
18	Model
19	Maximum installation depth
20	Service factor

2.2 Type key

50 and 60 Hz

Example	S	F	G.	44.	260.	39.	-.	5.	1B.	B

Type range
S SFG

Version
F Flowmaker

Drive
G Gear-driven

Motor output power P2
Code from type designation/10 [kW]
44 4.4 kW

Propeller diameter
260 260 cm

Propeller speed
39 39 min^{-1}

Explosion protection
[-] Non-explosion-proof
Ex Explosion-proof

Frequency
5 50 Hz
6 60 Hz

Supply voltage and starting method
0B 400-415 V, DOL
1B 400-415 V, Y/D
0K 380 V, DOL
1K 380 V, Y/D
0P 440-480 V, DOL
1P 440-480 V, Y/D
0Z Special, DOL
1Z Special, Y/D

Generation
[-] First generation
A Second generation
B Third generation

60 Hz ANSI

Example	S	F	G.	55.	51.	91.	6.	0P.

Type range
S SFG

Version
F Flowmaker

Drive
G Gear-driven

Motor output power P2
P2 Code from type designation/10 [hp]
55 5.5 hp

Propeller diameter
51 51 inches

Applications
[-] All applications

Propeller speed
91 91 rpm

Explosion protection
[-] Non-explosion-proof
Ex Explosion-proof

Frequency
6 60 Hz

Supply voltage and starting method
0P 440-480 V, DOL
1P 440-480 V, Y/D
0Z Special, DOL
1Z Special, Y/D

Generation
[-] First generation
A Second generation
B Third generation

3. Tools

Description			Flowmaker		Product number
Socket	TMFS6	Propeller	SFG.xx.130.xx SFG.xx.51.xx	50/60 Hz SI 60 Hz ANSI	95035457
	TMFS7	Bearings in gear head	SFG.xx.130.xx SFG.xx.51.xx	50/60 Hz SI 60 Hz ANSI	95035458
	TMFS8	Propeller	SFG.xx.180-230.xx SFG.xx.71-91.xx	50/60 Hz SI 60 Hz ANSI	96257444
	TMFS9	Bearings in gear head	SFG.xx.180-230.xx SFG.xx.71-91.xx	50/60 Hz SI 60 Hz ANSI	95035454
	TMFS10	Propeller	SFG.xx.260.xx SFG.xx.102.xx	50/60 Hz SI 60 Hz ANSI	95035455
	TMFS12	Bearings in gear head	SFG.xx.260.xx SFG.xx.102.xx	50/60 Hz SI 60 Hz ANSI	95035456
TMFT 36		Bearing-fitting tool kit	All		97905585

4. Torques and lubricants

Pos.	Description	Quantity	Dimensions	Torque		Lubricant
				[Nm]	[ft-lbs]	
1008	Screw		M6	8.8	6.5	Loctite 243
			M8	21.4	15.8	
			M10	44	32.5	
			M12	74	54.6	
			M16	183	135	
1020	Motor flange	1				Curil K2
1021	Screw			By hand		
1022	O-ring	2				Curil K2
1023	Terminal box cover	1				Curil K2
1024	Screw		M6	8.8	6.5	Loctite 243
			M8	21.4	15.8	
			M10	44	32.5	
			M12	74	54.6	
			M16	183	135	
1025	O-ring	1				Curil K2
1028	Screw			By hand		
1041	Screw	1	M6	8.8	6.5	Loctite 511
			M8	21.4	15.8	
			M10	44	32.5	
			M12	74	54.6	
			M16	183	135	
1044	Screw			By hand		
1049	Water-in-oil sensor	1				Loctite 511
1052	Plug	1		8	6	PTFE tape
1064	Screw		M4	3	2.2	Loctite 243
			M5	5.9	4.4	
			M6	10	7.4	
			M8	25	18.4	
			M10	49	36.1	
			M12	85	62.7	
			M16	210	154.9	
1090	Slotted nut	1		70	51.6	
1097	Wear ring	1				Loctite 648
1098	Shaft seal	Stationary part	Outside			Soapy water or cream
			Seal face			Loctite 7063
		Rotating part	Inside			Soapy water or cream
1099	Screw		M6	8.8	6.5	Loctite 243
			M8	21.4	15.8	
			M10	44	32.5	
			M12	74	54.6	
			M16	183	135	
1102	Plug			By hand		PTFE tape
1104	Lip seal	Outside and inside				Shell Cassida grease
1106	Slotted nut			70	51.6	
1111	Screw		M6	8.8	6.5	Loctite 511
			M8	21.4	15.8	
			M10	44	32.5	
			M12	74	54.6	
			M16	183	135	
1113	Screw		M6	8.8	6.5	Loctite 243
			M8	21.4	15.8	
			M10	44	32.5	
			M12	74	54.6	
			M16	183	135	
1158	Nut			30	22.1	

5. Oil types and quantity

50/60 Hz DIN

Type	Gear casing [l] ISO VG 220
SFG.xx.130.xx	1.3
SFG.xx.180.xx	3.2
SFG.xx.230.xx	3.2
SFG.xx.260.xx	4.6

60 Hz ANSI

Type	Gear casing [fl oz] ISO VG 220
SFG.xx.51.xx	44
SFG.xx.71.xx	108.2
SFG.xx.91.xx	108.2
SFG.xx.102.xx	155.5

6. Dismantling and assembling the product

Warning

Before starting service work, remove the fuses or switch off the power supply. Make sure that the power supply cannot be accidentally switched on.

Disconnect the power supply cable in accordance with local regulations.

Make sure that all rotating parts have stopped moving.

Warning

All regulations applying to mixers or flowmakers installed in potentially explosive environments must be observed.

Make sure that no work is carried out in potentially explosive environment.

Before starting any work on mixers or flowmakers used in liquids which could constitute a hazard to health, carry out thorough cleaning and venting of mixer or flowmaker, tank, etc. according to local regulations.

Spare parts

Replace defective parts by new parts. Motor parts must not be reconditioned by machining, retapping, welding, etc.

6.1 General information

Position numbers of parts (digits) refer to section *9. Sectional drawings* and *10. Exploded drawings*.

Before assembling the product

- Clean and check all parts.
- Replace defective parts by new parts.
- Order the necessary service kits.
- Always replace gaskets and O-rings.

During assembly

- Lubricate and tighten screws and nuts according to section *4. Torques and lubricants*.

6.2 Dismantling the product

6.2.1 Propeller

SFG.xx.180/230.xx [DIN] / SFG.xx.71-91.xx [ANSI]

1. Remove the screw (pos. 1115), the nut (pos. 1160) and the washer (pos. 1159).
2. Fit the screw (pos. 1161) and tighten it to open the clamp.
3. Loosen the blade from the hub.
4. Carefully remove the blade (pos. 1162) from the hub with a suitable lifting equipment.

SFG.xx.260.xx [DIN] / SFG.xx.102.xx [ANSI]

1. Remove the screw (pos. 1113), the cover plates (pos. 1132) and the washer (pos. 1114) from the propeller blade.
2. Refit the screw (pos. 1113) and tap on the end of the screw to loosen the blade from the hub.
3. Carefully lift the blade out of the hub with a suitable lifting equipment.

6.2.2 Hub

1. Remove the plug (pos. 1102).
2. Remove the plug (pos. 1101) and drain the oil into a suitable container.
3. Remove the screw (pos. 1111), the washer (pos. 1110) and the hub cover (pos. 1109).
4. Remove the outer slotted nut (pos. 1106) with a suitable tool.
5. Remove the inner slotted nut (pos. 1106).
6. Remove the O-ring (pos. 1108) or the gasket (pos. 1157) from the propeller.
7. Gently tap on the back of the hub with a plastic hammer to remove it from the shaft.

6.2.3 Sealing system of propeller hub and gear casing

1. Remove the lip seals (pos. 1104) from the inside of the hub.
2. Remove the key (pos. 1105) from the shaft.

Note ***These pumps have no key:***
SFG.xx.260.xx [DIN]
SFG.xx.102.xx [ANSI].

Caution ***Take care not to damage the surface of the wear ring.***

3. Remove the rotating shaft seal part (pos. 1098) from the gear shaft (pos. 1093).
4. Gently tap on the side of the wear ring to remove it from the gear casing.
5. Remove the stationary shaft seal part (pos. 1098) from the wear ring.
6. Remove the intermediate ring (pos. 1095) from the wear ring.

Note ***These pumps have no intermediate ring:***
SFG.xx.180-230.xx [DIN]
SFG.xx.71-91.xx [ANSI].

6.2.4 Motor and cable

1. Place the motor in horizontal position with the terminal box upwards.
2. Remove the screws (pos. 1024).
3. Cut with a knife along the terminal box cover (pos. 1023) to protect the paint.
4. Remove the terminal box cover and the O-ring (pos. 1025).
5. Write down the numbers on the wires to ensure correct connection.
6. Disconnect the cable conductors from the motor windings including the screw (pos. 1028).
7. Remove the cable relief (pos. 1009) from the cable (pos. 1001).
8. Cut with a knife between the terminal box and the cable flange (pos. 1002) to protect the paint.
9. Remove the screws (pos. 1008), the cable flange (pos. 1002) and the cable (pos. 1001).
10. Remove the small cable seal (pos. 1006), the thrust washer (pos. 1005), the large cable seal (pos. 1004), the cable guide (pos. 1003) and the cable flange (pos. 1002) with the O-ring (pos. 1007).
11. Place the motor in vertical position with the shaft upwards.
12. Remove the screws (pos. 1021).
13. Cut with a knife between the motor flange (pos. 1020) and the motor housing (pos. 1017) to protect the paint.
14. Screw two screws into the threaded holes of the motor flange to separate the motor flange and motor housing.
15. Remove the motor flange with rotor (pos. 1019) from the motor housing.

Note ***Take care not to damage the wires of the water-in-oil sensor (pos. 1049).***

16. Remove the locking ring (pos. 1051) and the spacer ring (pos. 1050).
17. Remove the rotating shaft seal part (pos. 1048).
18. Remove the rotor flange (pos. 1020) from the rotor.
19. Push the stationary shaft seal part (pos. 1048) out of the motor flange (pos. 1020).
20. Remove the water-in-oil sensor (pos. 1049).
21. Remove the seal washer (pos. 1173) from the water-in-oil sensor.
22. Place the motor in horizontal position.
23. Remove the compensation disc (pos. 1038) from the N-end of the motor housing.
24. Remove the bearing (pos. 1039) from the rotor shaft (pos. 1019).
25. Remove the O-ring (pos. 1022) from the motor flange.
26. Remove the nut (pos. 1158), the spring washer (pos. 1045) and the screw (pos. 1044) from the motor housing.
27. Remove the stator from the motor housing.

Note ***Take care not to damage any wires.***

6.2.5 Gear casing

1. Cut with a knife between the motor housing (pos. 1017) and the intermediate flange (pos. 1072) as well as between the intermediated flange and the gear casing (pos. 1088) to protect the paint.
2. Remove the screws (pos. 1021).
3. Lift the unit with a crane and knock the motor housing free of the gear casing.
4. Remove the gear casing and intermediate flange.
5. Remove the planet carrier (pos. 1067) and the sun wheel (pos. 1060).
6. Remove the O-ring (pos. 1071) from the sun wheel.
7. Remove the O-ring (pos. 1022) from the motor flange (pos. 1020).
8. Remove the shaft seal (pos. 1048) from the motor flange/motor shaft.
9. Remove the screws (pos. 1064) from the ring gear (pos. 1062).
10. Remove the ring gear.

SFG.xx.130.xx [DIN] / SFG.xx.51.xx [ANSI]

1. Remove the locking ring (pos. 1089) from the gear shaft (pos. 1093).
2. Unlock the lock washer (pos. 1091).
3. Remove the slotted nut (pos. 1090).
4. Remove the lock washer (pos. 1091).

SFG.xx.180-230.xx [DIN] / SFG.xx.71 - 102.xx [ANSI]

1. Remove the locking ring (pos. 1089) from the gear shaft (pos. 1093).
2. Remove the slotted nut (pos. 1090).

SFG.xx.260.xx [DIN] / SFG.xx.102.xx[ANSI]

1. Unlock the lock washer (pos. 1091).
2. Remove the slotted nut (pos. 1090).
3. Remove the lock washer (pos. 1091).

All types

1. Knock the shaft out of the gear casing using a plastic hammer. The inner bearing ring (pos. 1092) is removed at the same time.
2. Remove the outer bearing rings (pos. 1092 and 1094).
3. Remove the inner bearing rings (pos. 1094) from the shaft by means of a puller.

6.3 Assembling the product

6.3.1 Motor

Note ***Make sure that the rotor is positioned correctly.***

Caution ***Do not use a hammer.***

1. Heat the bearings (pos. 1039 and 1047) and fit them on the ends of the rotor shaft.

Caution ***If you use a bearing heater, make sure that the temperature does not exceed 80 °C (176 °F).***

Note ***Use a hydraulic press if a bearing heater is not available.***

2. Fit the seal washer (pos. 1173) on the water-in-oil sensor (pos. 1049) and lubricate the washer and threads with Loctite 511.
3. Fit the water-in-oil sensor into the motor flange (pos. 1020) and tighten it a little by hand.

Note ***Keep the wires of the water-in-oil sensor away from the bearing, for instance by means of a plastic strip.***

4. Lubricate the groove for the O-ring (pos. 1022) on the motor side of the motor flange (pos. 1020) with Curil K2.
5. Fit and lubricate the O-ring with Curil K2.
6. Insert the rotor (pos. 1019) into the motor flange (pos. 1020).
7. Place the rotor with the motor flange upwards.
8. Fit the stationary shaft seal part (pos. 1048) into the motor flange (pos. 1020).
9. Clean the shaft and the seal face of the shaft seal.
10. Fit the rotating shaft seal part (pos. 1048) on the stationary shaft seal part.
11. Fit the spacer ring (pos. 1050) and the locking ring (pos. 1051).
12. Insert the stator into the motor housing (pos. 1017).

Note ***Make sure that the fixation holes for alignment are positioned correctly.***

Caution ***Take care not to damage any wires.***

13. Fit the screw (pos. 1044), the spring washer (pos. 1045) and the nut (pos. 1158), and tighten the nut. See section *4. Torques and lubricants*.
14. Lead the wires into the terminal box.
15. Place the motor housing (pos. 1017) in vertical position.
16. Fit the compensation disc (pos. 1038) in the N-end of the motor housing.
17. Insert the rotor into the motor housing. Connect the wires of the water-in-oil sensor (pos. 1049) before the rotor is fully inserted.

Note ***Align the motor flange with the water-in-oil sensor pointing downwards/away from the terminal box.***

18. Fit the screws (pos. 1021) and tighten them a little by hand.
19. Place the motor in horizontal position.
20. Fit the cable flange (pos. 1002) and the O-ring (pos. 1007) on the cable (pos. 1001).
21. Lubricate the O-ring with soapy water or cream and fit it into the cable flange.
22. Fit the cable guide (pos. 1003), the large cable seal (pos. 1004), the thrust washer (pos. 1005) and the small cable seal (pos. 1006) on the cable (pos. 1001).
23. Lubricate the complete seal unit with soapy water or cream and insert it into the terminal box.
24. Lubricate the threads of the screws (pos. 1008) with Loctite 243.
25. Fit the screws into the cable flange and tighten them. See section *4. Torques and lubricants*.
26. Fit the cable relief (pos. 1009) on the cable.

Note ***Make sure that you have enough cable in the terminal box before tightening the cable relief.***

27. Fit the screw (pos. 1028) and the lock washer (pos. 1029).
28. Connect the wires according to the notes you made during dismantling. Secure connections with terminal tubes and shrink-on sleeves.
29. Remove the screw (pos. 1041) and the washer (pos. 1040) from the motor housing.
30. Wrap PFTE tape around the plug (pos. 1052).
31. Fit the plug into the motor housing and tighten it. See section *4. Torques and lubricants*.
32. Lubricate the screw (pos. 1041) with Loctite 511 and fit the washer (pos. 1040) on the screw.
33. Fit the screw into the motor housing (pos. 1017) and tighten it. See section *4. Torques and lubricants*.
34. Lubricate the groove in the terminal box cover (pos. 1023) with Curil K2.
35. Fit and lubricate the O-ring with Curil K2.
36. Fit the terminal box cover (pos. 1023).
37. Lubricate the threads of the screws (pos. 1024) with Loctite 243 and tighten the screws. See section *4. Torques and lubricants*.

6.3.2 Gear casing

1. Fit the ring gear (pos. 1062) into the gear casing (pos. 1088).
2. Lubricate the threads of the screws (pos. 1064) with Loctite 243 and tighten the screws. See section *4. Torques and lubricants*.
3. Fit the outer bearing ring (pos. 1092) into the gear casing.
4. Heat the inner bearing ring (pos. 1094) using a bearing heater and fit it on the shaft.

Caution ***If you use a bearing heater, make sure that the temperature does not exceed 80 °C (176 °F).***

Note ***Use a hydraulic press if a bearing heater is not available.***

5. Fit the shaft (pos. 1093) into the gear casing.
6. Heat the inner bearing ring (pos. 1092) using a bearing heater and fit it on the shaft.

SFG.xx.130.xx [DIN] / SFG.xx.51.xx [ANSI]

1. Fit the lock washer (pos. 1091) and the slotted nut (pos. 1090) on the shaft, and tighten the slotted nut. See section *4. Torques and lubricants*.
2. Lock the slotted nut with the lock washer.
3. Fit the locking ring (pos. 1089).

SFG.xx.180-230.xx [DIN] / SFG.xx.71 - 102.xx [ANSI]

1. Fit the slotted nut (pos. 1090) on the shaft, and tighten the slotted nut. See section *4. Torques and lubricants*.
2. Fit the locking ring (pos. 1089).

SFG.xx.260.xx [DIN] / SFG.xx.102.xx [ANSI]

1. Fit the lock washer (pos. 1091) and the slotted nut (pos. 1090) on the shaft, and tighten the slotted nut. See section *4. Torques and lubricants*.

All types

1. Wrap PFTE tape around the plug (pos. 1101).
2. Fit the plug into the gear casing and tighten it.
3. Fit the sun wheel (pos. 1060).
4. Lubricate the O-ring with oil and fit it on the shaft.

Note ***Check that the shaft seal (pos. 1048) is intact and that the shaft can rotate freely.***

5. Fit the planet carrier (pos. 1083), the intermediate flange and the second gear stage, and place the gear casing on the motor flange.

6. Lubricate the threads of the screws (pos. 1099) with Loctite 243 and fasten the gear casing on the motor flange. See section *4. Torques and lubricants*.
7. Apply a new coat of paint if the coat is damaged.

6.3.3 Sealing system of propeller hub and gear casing

1. Lubricate the wear ring (pos. 1097) with Loctite 648 and fit it in the propeller end of the gear casing.
2. Insert the intermediate ring (pos. 1095) into the wear ring if the version requires an additional ring.
3. Lubricate the stationary shaft seal part (pos. 1098) with soapy water or cream and fit it into the wear ring.
4. Remove surplus soapy water or cream and clean the surface of the stationary part by means of Loctite 7063.
5. Remove the inner ring from the rotating shaft seal part and fit the rotating shaft seal part (pos. 1098).
6. Lubricate the inner lip seal (pos. 1104) with Shell Cassida grease and fit it into the hub with the open side pointing away from the hub.
7. Lubricate the inner lip seal with Shell Cassida grease, and fit and lubricate the outer lip seal.
8. Fit the key (pos. 1105) into the gear shaft.
9. Lubricate the shaft with Shell Cassida grease and fit the hub on the shaft.

6.3.4 Hub

1. Fit the slotted nut on the shaft with the chamfered end pointing away from the hub and tighten it. See section *4. Torques and lubricants*.
2. Fit the other slotted nut on the shaft with the chamfered end towards the hub and tighten it. See section *4. Torques and lubricants*.
3. Fill the hub top partly with gear oil.
4. Fit the hub cover (pos. 1109).
5. Lubricate the threads of the screw (pos. 1111) with washer (pos. 1110) with Loctite 511.
6. Fit the screw and tighten it. See section *5. Oil types and quantity*.

6.3.5 SFG.xx.180 - 230.xx [DIN] / SFG.xx.71 - 91.xx [ANSI]

1. Check the premounted pins (pos. 1116) (only for positioning).
2. Tighten the middle screw (pos. 1161) to spread the hub opening.
3. Insert the blade from above. Turn the blade slightly and let it rest on the pin. Turn back until the blade slides down and is flush with the hub.
4. Remove the middle screw.
5. Lubricate the threads of the screw (pos. 1161) with Loctite 243.
6. Fit the washers, bolts and nuts (pos. 1115, 1159, 1160) into both holes and tighten the nuts by hand.
7. Tighten the nuts with a torque wrench to 100 Nm (A4-80).
8. Fit the middle screw (pos. 1161) and tighten it, but not too tight.
9. Lubricate all joints with Loctite 511 or silicone.

6.3.6 SFG.xx.260 [DIN] / SFG.xx.102 [ANSI]

1. Fit the key (pos. 1131) into the shaft of the propeller blade, and lubricate the shaft and key with Shell Cassida grease.
2. Turn the hub so that the blade can be inserted from above.
3. Insert the blade (pos. 1162) into the hub with suitable lifting equipment.
4. Fit the cover plate (pos. 1132) and the washer (pos. 1114) on the screw (pos. 1113).
5. Lubricate the threads of the screw (pos. 1113) with Loctite 243 and fasten the propeller blade. See section *4. Torques and lubricants*.
6. Seal the groove between the hub and blade with Loctite 511.
7. Seal the cover plates and screws in the hub with Loctite 511.

6.4 Filling the gear casing with oil

1. Wrap PFTE tape around the plug (pos. 1101).
2. Fit the plug into the gear casing and tighten it.
3. Fill the gear casing with oil through the hole for the plug (pos. 1102). See section *5. Oil types and quantity*.
4. Wrap PFTE tape around the plug (pos. 1102).
5. Fit the plug into the gear casing and tighten it.
6. Apply a new coat of paint if the coat is damaged.

6.4.1 Cable entry

1. Fit the cable flange (pos. 1002) and the cable guide (pos. 1003) on the motor cable.
2. Lubricate the cable with soapy water or cream and fit the cable entry (pos. 1004), the thrust washer (pos. 1005) and the cable entry (pos. 1006) on the motor cable.
3. Lead the cable into guide flange (pos. 1124).

Caution ***Make sure that the cable entry is fitted correctly in the cable hole of the guide flange.***

4. Fit the screws (pos. 1008) with the washers into the cable flange and cross-tighten the screws. See section *4. Torques and lubricants*.
5. Lubricate the groove for the O-ring (pos. 1025) with Curil K2 and fit the O-ring.
6. Connect the wires according to the notes you made during dismantling. Secure connections with terminal tubes and shrink-on sleeves.
7. Fit the earth conductor and the washer (pos. 1029) on the screw (pos. 1028).
8. Fit the screw into the terminal box on the motor housing and tighten it.
9. Fit the guide flange on the motor housing.

Caution ***Take care not to damage any wires.***

10. Fit the cable clamp with the conical shape upwards using the screws and the washers.
11. Apply a new coat of paint if the coat is damaged.

7. Testing the AL05 Ex leakage sensor

Warning

If the sensor has been or is to be incorporated in an explosion-proof product, you must not carry out the tests described below. The intrinsically safe sensor (EN 60079-11) loses the explosions-proof aspect if it is connected to non-intrinsically safe devices.

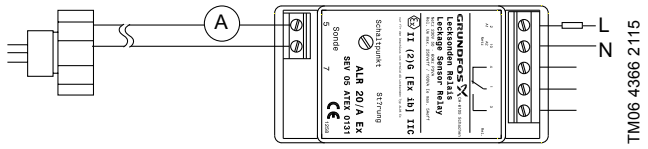
The AL05 Ex leakage sensor is integrated in a submerged agitator and connected to the ALR 20/A Ex leakage sensor relay via two wires. The relay supplies the sensor with power and receives a current signal from the sensor. The signal depends on the amount of water in the gear oil.

The current signal decreases as the amount of water in the oil increases and is compared to a manually adjustable switching point. If the switching point is exceeded, the relay switches to fault mode.

In case of a short circuit or a cable breakage the relay also automatically switches to fault mode.

Leakage sensor with relay

In order to test the sensor and the relay, measure the current flowing through the sensor and compare it to the values in the table below.



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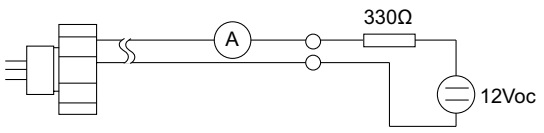
Current measured [mA]		Cause	Status of relay
< 0.5	No current	Cable breakage	Fault
0.5 - 5	Low current	Water in the oil	Fault
5-11	Normal value	A little or no water in the oil	Depends on the switching point of the relay.
> 11	Too high current	The power supply cable is short-circuited.	Fault

Leakage sensor without relay

If no relay is available or the sensor is to be tested separately, you can replace the relay by a direct-current supply of 12 V. In this case a 330 Ω resistor must be added to the circuit.

Now, the measured current is comparable to the table above.



TM06 4367 2115

8. Winding resistance and stator sizes

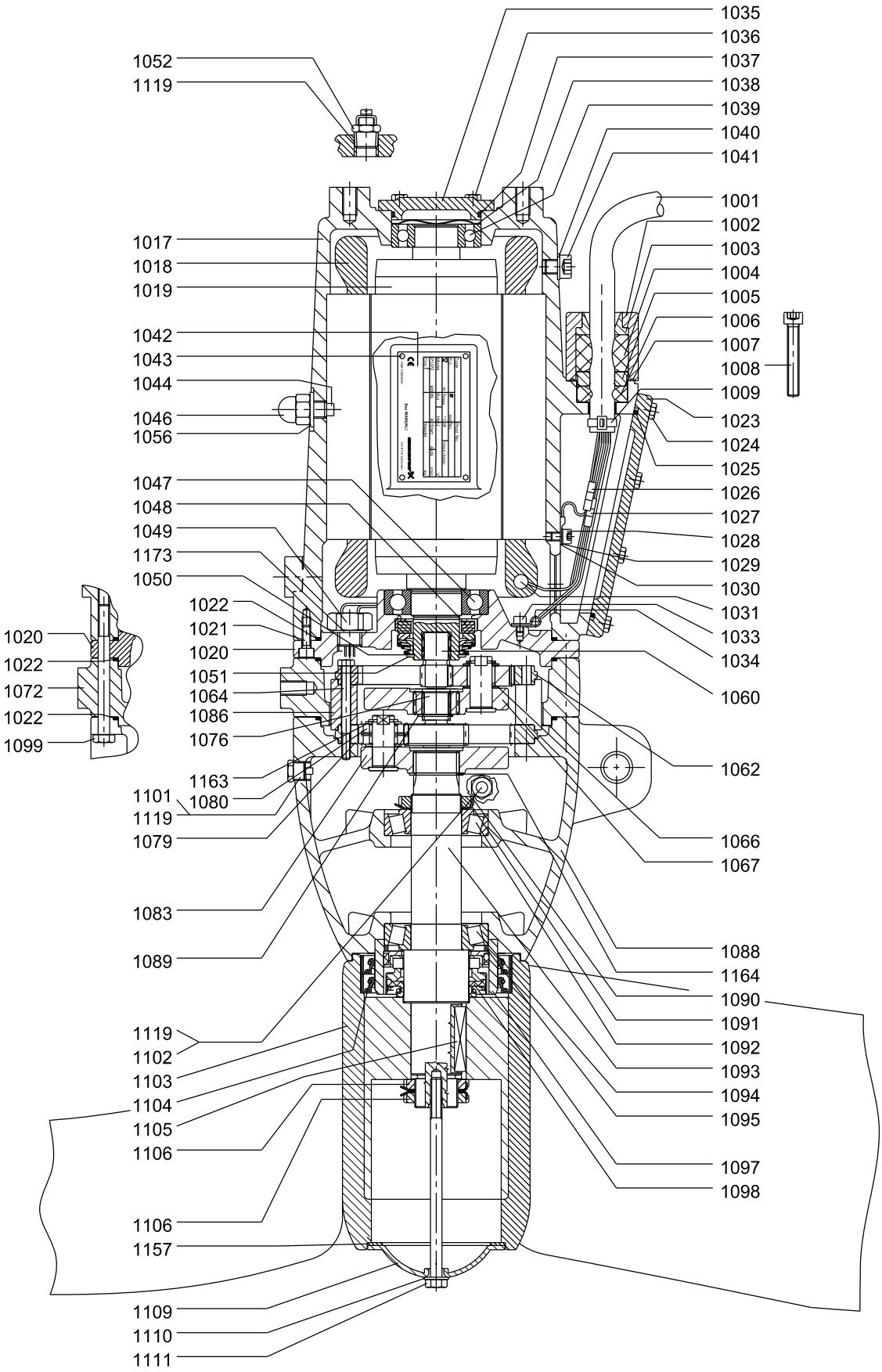
Product type			Stator winding					No-load current**			Connection	Product number
50 Hz	60 Hz	60 Hz ANSI	Poles	Winding resistance*	Length	Outer diameter	Inner diameter	50 Hz, 400 V	60 Hz, 380 V	60 Hz, 460 V		Motor kit
				[Ω]	[mm]	[mm]	[mm]	[A]	[A]	[A]		
SFG.07.130	SFG.07.130	SFG.10.51	6	4.0	125	155	100	2.2	1.5	1.9	Y	95039700
SFG.10.130	SFG.10.130	SFG.14.51										
SFG.14.130	SFG.14.130	SFG.19.51										
SFG.07.180	SFG.07.180	SFG.10.71										
SFG.10.180	SFG.10.180	SFG.14.71										
SFG.14.180	SFG.14.180	SFG.19.71										
SFG.07.230	SFG.07.230	SFG.10.91										
SFG.10.230	SFG.09.230	SFG.12.91										
SFG.12.230	SFG.12.230	SFG.16.91										
SFG.15.230	SFG.16.230	SFG.22.91										
SFG.17.130	SFG.17.130	SFG.23.51	4	5.1	155	155	100	2.8	1.8	2.5	Δ	95039701
SFG.22.130	SFG.22.130	SFG.30.51										
SFG.27.130	SFG.29.130	SFG.39.51										
SFG.33.130	SFG.33.130	SFG.44.51										
SFG.36.130	SFG.36.130	SFG.48.51										
SFG.17.180	SFG.17.180	SFG.23.71										
SFG.22.180	SFG.22.180	SFG.30.71										
SFG.26.180	SFG.29.180	SFG.39.71										
SFG.32.180	SFG.35.180	SFG.47.71										
SFG.36.180	SFG.38/40.180	SFG.55.71										
SFG.17.230	SFG.19.230	SFG.26.91										
SFG.22.230	SFG.22.230	SFG.30.91										
SFG.26.230	SFG.25.230	SFG.34.91										
SFG.33.230	SFG.32.230	SFG.43.91										
SFG.36.230	SFG.38/40.230	SFG.55.91										
SFG.22.260	SFG.22.260	SFG.30.102	6	2.2	230	200	135	6.5	5.3	6.6	Δ	95039707
SFG.27.260	-	-										
SFG.32.260	SFG.32.260	SFG.43.102										
SFG.36.260	SFG.36.260	SFG.48.102										
SFG.44.260	SFG.44.260	SFG.60.102										
SFG.48.260	-	-										
SFG.50.260	SFG.50.260	SFG.67.102	6	1.7	270	200	135	8.0	5.9	7.3	Δ	95039708
SFG.60.260	SFG.60.260	SFG.82.102										
SFG.66.260	-	-										
SFG.74.260	SFG.72.260	SFG.98.102										
SFG.80.260	SFG.80.260	SFG.110.102										

* Resistance of one phase winding without power supply cable. Tolerances: ± 0.2 for values greater than 1 and ± 0.1 for values less than 1.

** No-load current at a specific power supply (± 10 %).

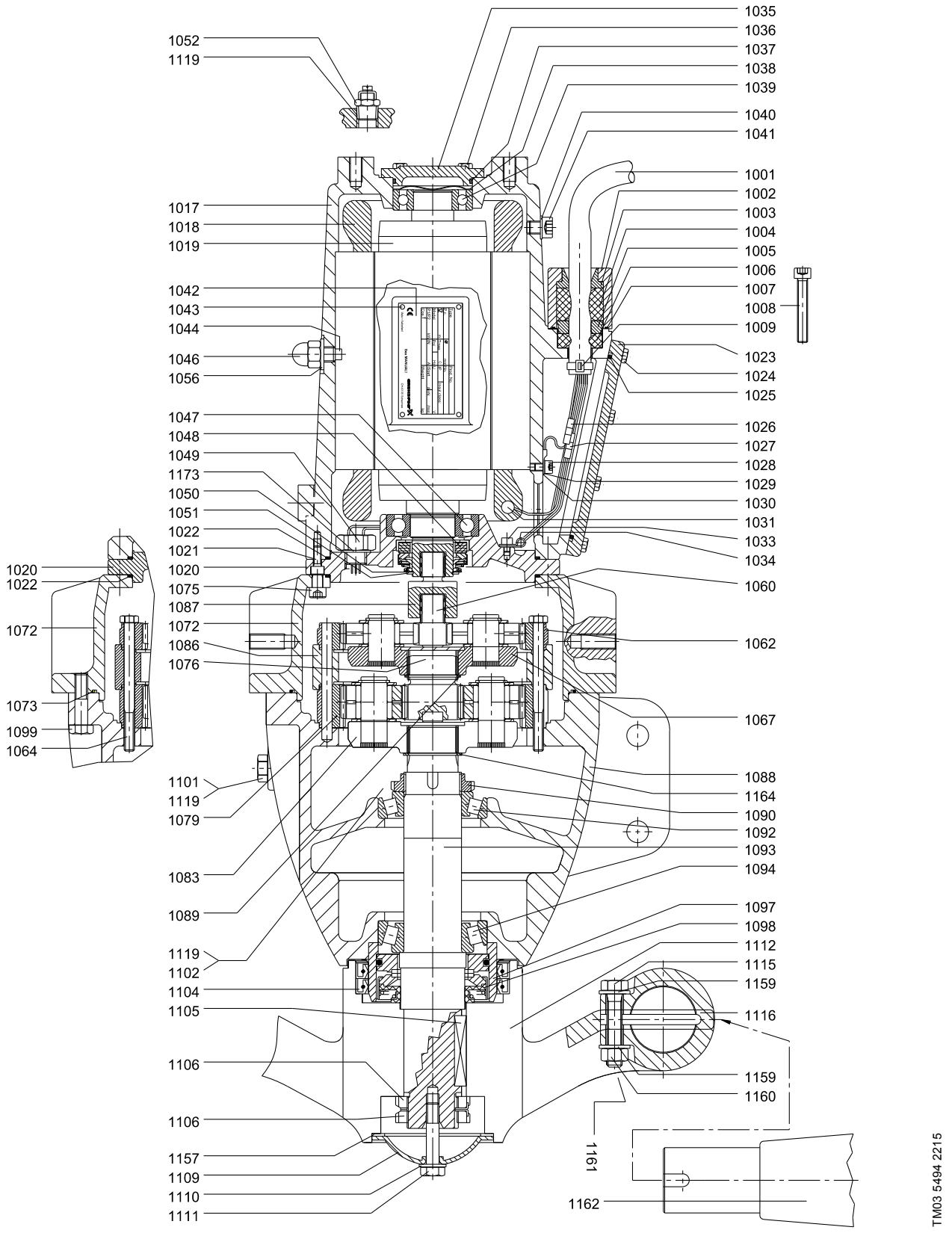
9. Sectional drawings

9.1 SFG.xx.130.xx [DIN] / SFG.xx.51.xx [ANSI]



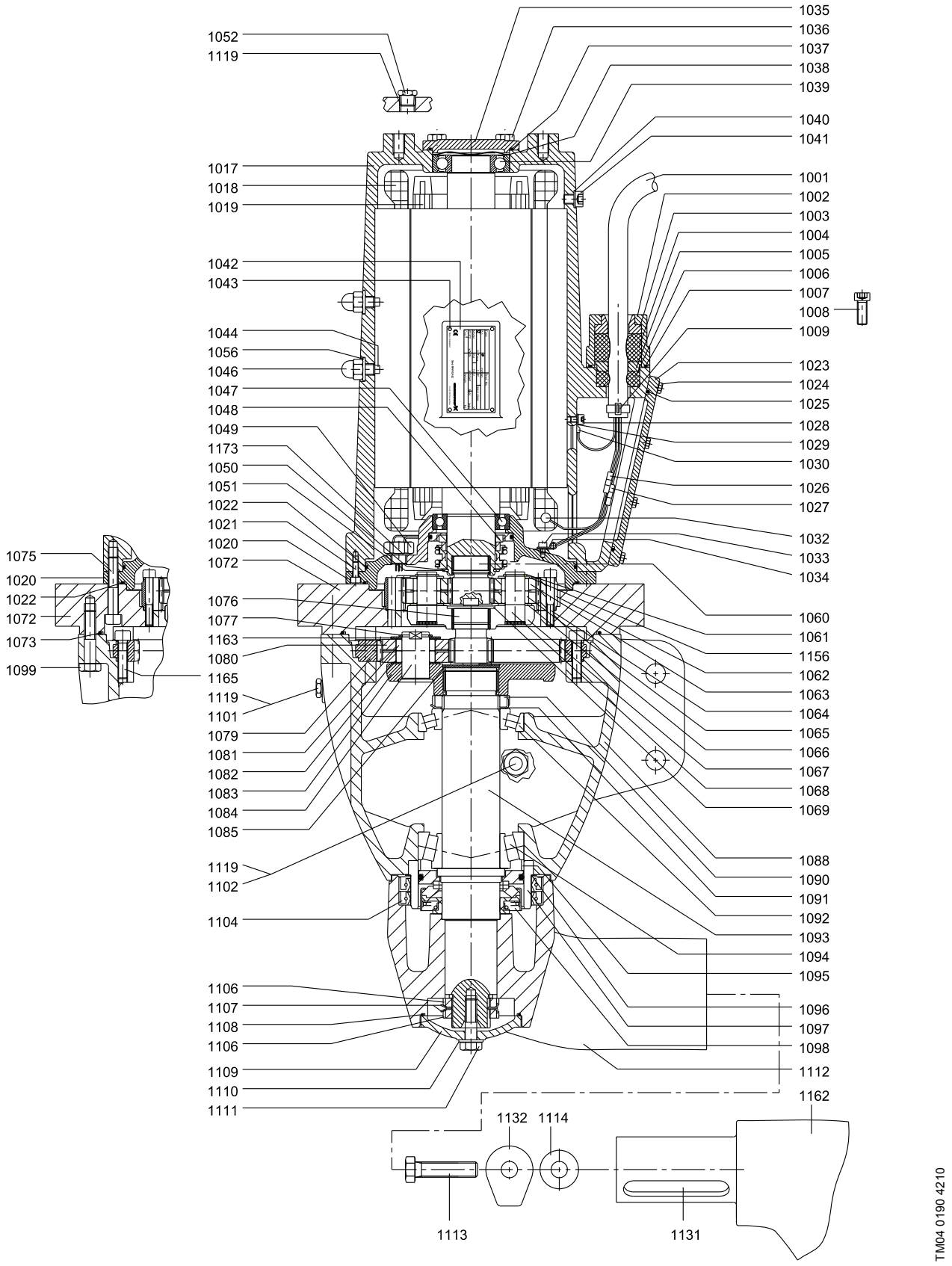
TM03 5492 2215

9.2 SFG.xx.180 - 230.xx [DIN] / SFG.xx.71 - 91.xx [ANSI]



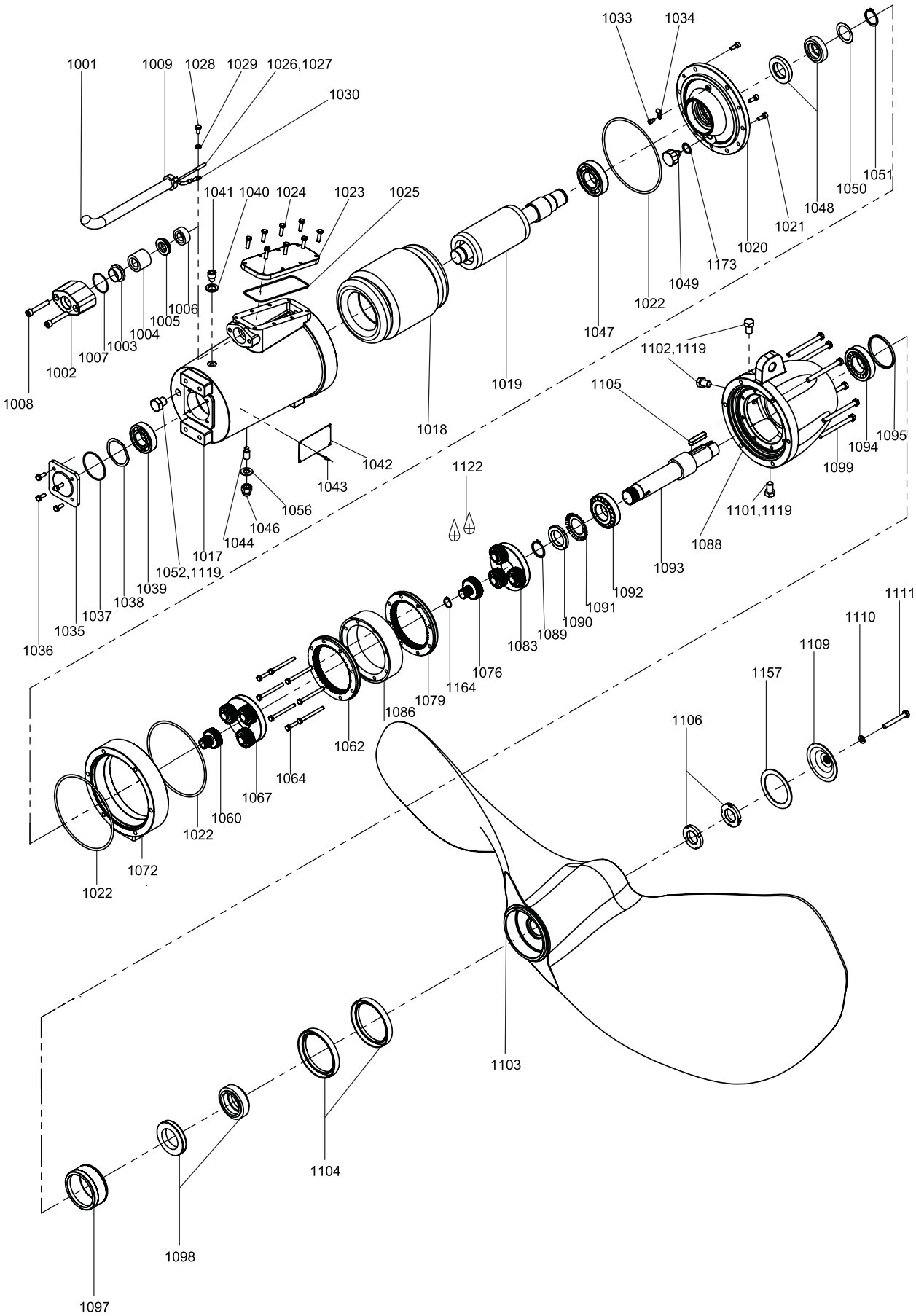
TM03 5494 2215

9.3 SFG.xx.260.xx [DIN] / SFG.xx.102.xx [ANSI]



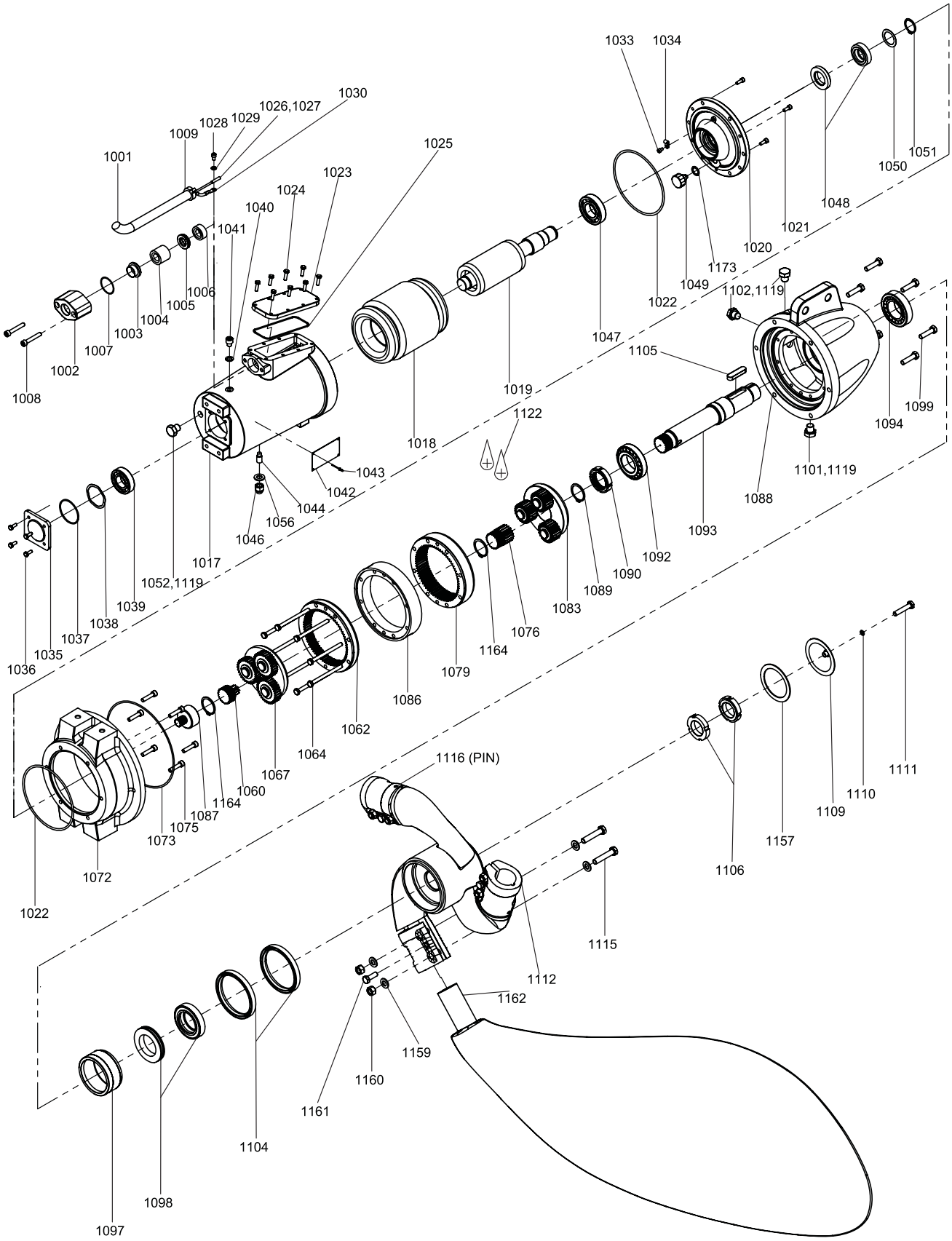
10. Exploded drawings

10.1 SFG.xx.130.xx [DIN] / SFG.xx.51.xx [ANSI]



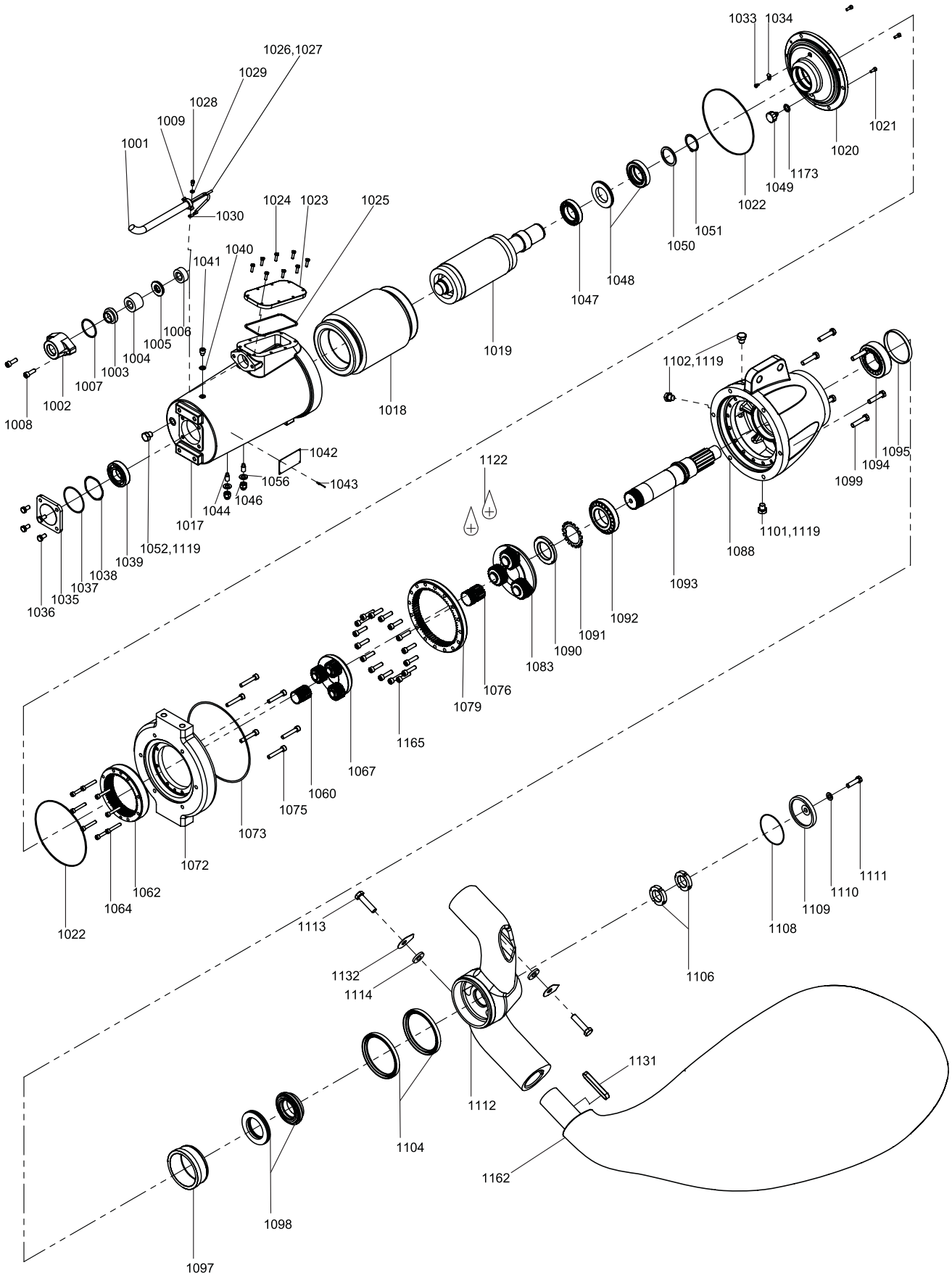
TM06 2483 4314

10.2 SFG.xx.180 - 230.xx [DIN] / SFG.xx.71 - 91.xx [ANSI]



TM06 2485 4314

10.3 SFG.xx.260.xx [DIN] / SFG.xx.102.xx [ANSI]



TM06 3062 4514

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