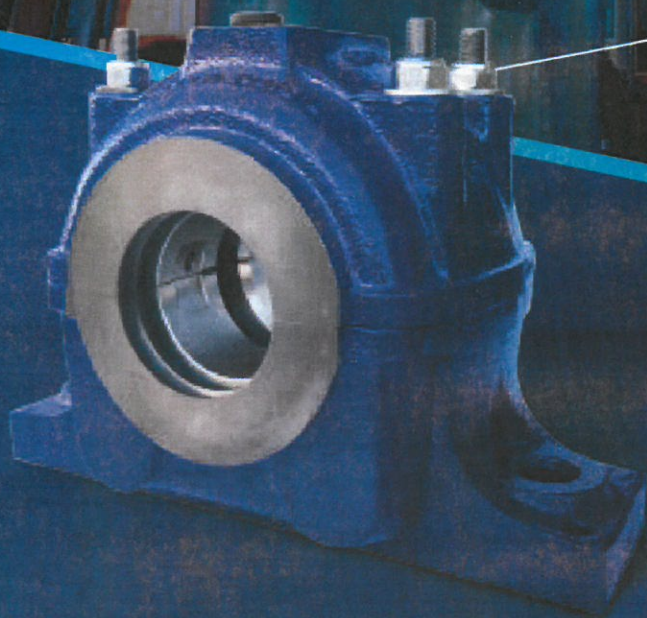


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SLIDE
BEARINGS
TYPE M
IN MECHANICAL
ENGINEERING



INSTRUCTIONS
FOR INSTALLATION,
MAINTENANCE
AND OPERATION

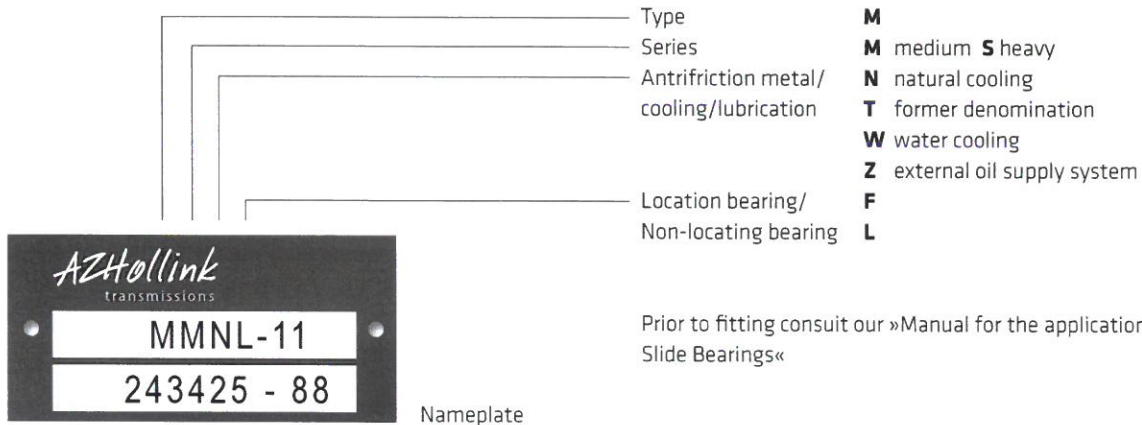
SLIDE BEARINGS TYPE M

INSTRUCTIONS FOR INSTALLATION, MAINTENANCE AND OPERATION

These instructions contain only data required for the assembly of types of bearings listed below.

Further details may be taken from our brochure: »Manual for the application of slide bearings«.

DESIGNS AND CODIFICATION



Prior to fitting consult our »Manual for the application of Slide Bearings«

DESPATCH

M type bearings are supplied in assembled condition. Oil rings/ adjustable collars or separate thrust collars are inserted in the casing, small parts are separately packed.

INSTALLATION (FIG. 1)

After loosening the lock nuts (5), remove bearing top (2) and upper shell (4). Clean carefully inside of bearing and the running surfaces of the shell. Do not use fuzzy rags or cotton waste, since any fibres which might remain inside the bearing will cause increased bearing temperatures and operating troubles.

The tilting motion of the bearing shells (3 + 4) incorporated in the casing (1 + 2) balances out inaccuracies of installation without causing unfavourable pressure concentration on the edges.

In case of non-locating bearings (last code letter . . . L) fit oil ring first (fig. 2). Locate coil springs (12) and washers (11) in the recess of one ring half in that way that the head of the washer faces the shaft. Then push the ring half with springs and washers under the shaft so that the second ring half can be put on. The matching sides of the ring halves are identified by a stamped marking.

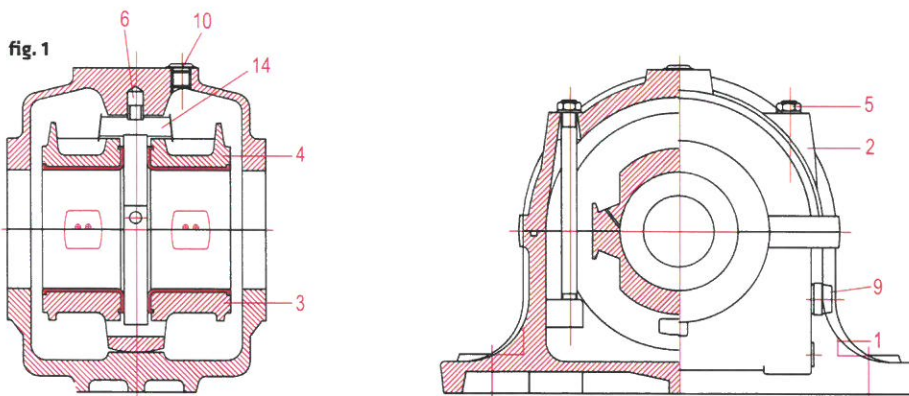
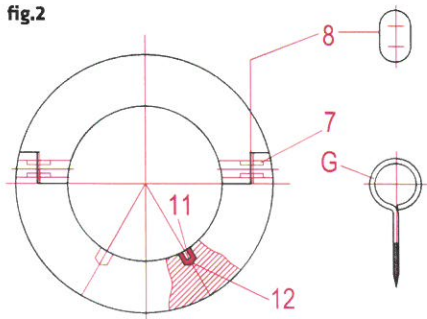
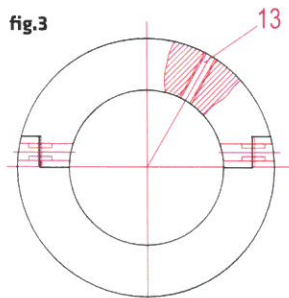


fig.2



Push pin (7) by means of the screwed-in »G« key, in the holes so that the annular retainer spring (8) snaps into the groove of the pin. Then screw-out the »G« key.

fig.3



In case of locating bearings (last code letter...F) fit the split adjustable collar in the same way as described above for the oil ring and tighten the pressure screw (13) with screw driver.

Thrust collars are to be heated to 250 to 300° C for shrinking them on to the shaft. If they are fixed to the shaft in pre-turned condition, finish them afterwards and see to it that they, in either case, run true.

Prior to installing the shaft, oil its running surface to eliminate any damage to the high-quality sliding surfaces. For this purpose, use a pure mineral oil, a mixture of oil/graphite or oil/MoS₂.

After installation of the shaft, put on the oiled upper shell (4). (Pay attention to the correct position of the shells, they are ear-marked!). Place the oil scraper (14) on to the oil ring/collar and insert the upper half of the undulated spring (6). Its retaining pin is to locate the recess provided in the shell and in the housing top. After having put on the top of the housing tighten the lock nuts.

Attention!

The running surface are superfinished and must not be scraped. Any scraping would be detrimental to the surface quality.

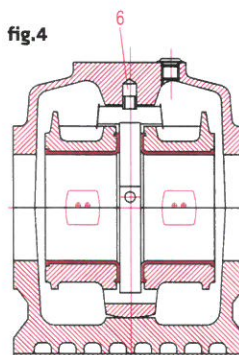
LUBRICATION

Use a branded mineral oil with low foaming characteristics for normal operating conditions. The viscosity depends on the diameter and the speed of rotation of the shaft. Particulars are shown on page 4. In individual cases the viscosity is prescribed in our Acknowledgment of order. The non-compliance with this prescription would lead to damages. In case of doubt please consult us.

The oil is to be filled in, on principle, during standstill of the shaft. For this purpose, remove the oil plug (10) or, in case of the bearing sizes up to ML...8, MM...7 and MS...6, the oil level plug (9). The necessary quantity is attained as soon as the oil issues from the oil level plug hole or, with bigger bearings, when the oil level is to be seen in the middle of the oil sight glass.

Check oil level from time to time and fill up if necessary. Since, depending on the speed, more or less oil will be circulating during operation, the oil level can be checked only when the shaft is stationary, otherwise too much oil would be filled in which would result in oil losses by overflowing when the machine is stopped.

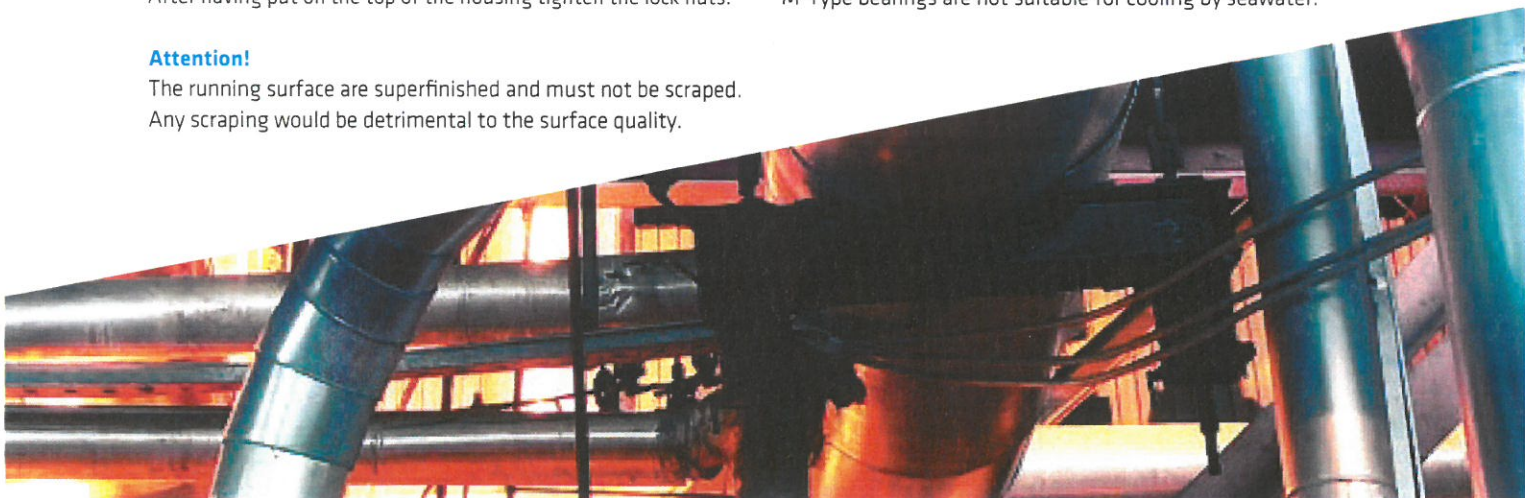
fig.4



M-TYPE BEARINGS WITH WATER COOLING (MMW. AND MSW.)

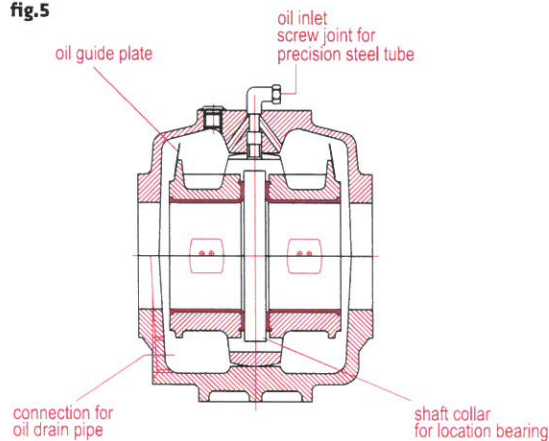
The MMW. And MSW. types are provided with a water cooling system in the base plate. Connect the cooling water inlet pipe to the water supply with an intermediary control valve. The water should flow off by gravity. The maximum admissible pressure in the water channel is 2 bar. The cooling water circulation can be in either direction.

M-Type bearings are not suitable for cooling by seawater.



Important!

The operational safety of the bearing is not improved when the water flow is started prior to putting the installation into operation. This would supercool the oil, particularly after extended periods of non-operation, so that the oil conveyance would be hindered. The water flow should be started only when the bearing has a temperature of at least 40° C. The rate of flow is to be adjusted in such a manner that a bearing temperature of approx. 65° C will result during operation. A temperature of 80° C should not be exceeded.

fig.5**M-TYPE BEARINGS WITH EXTERNAL OIL SUPPLY SYSTEM (MMZ. AND MSZ.) (FIG. 5)**

Connect the oil supply line (precision steel tube to DIN 2391) with the screw joint on top the housing. The drain line can be connected with the tap holes (to BSP) either on the left or the right side of the casing bottom. Lay drain line so that there is an adequate slope (an inclination of at least 15° is recommended).

The cross-section to be selected must be adequate, i.e. it should not be smaller than the drain hole. Detours are to be avoided. Bends and angular bypasses will cause, due to the pipe resistance, a backpressure. For high rates of oil flow both drains may be connected.

The rate of flow is to be adjusted according to the indication in our Acknowledgement of Order.

As to the installation of the oil supply plant, please refer also to the above mentioned »Manual for the application of Slide Bearings«.

The life

The life of your M-type bearings can be prolonged if you observe the following recommendations:

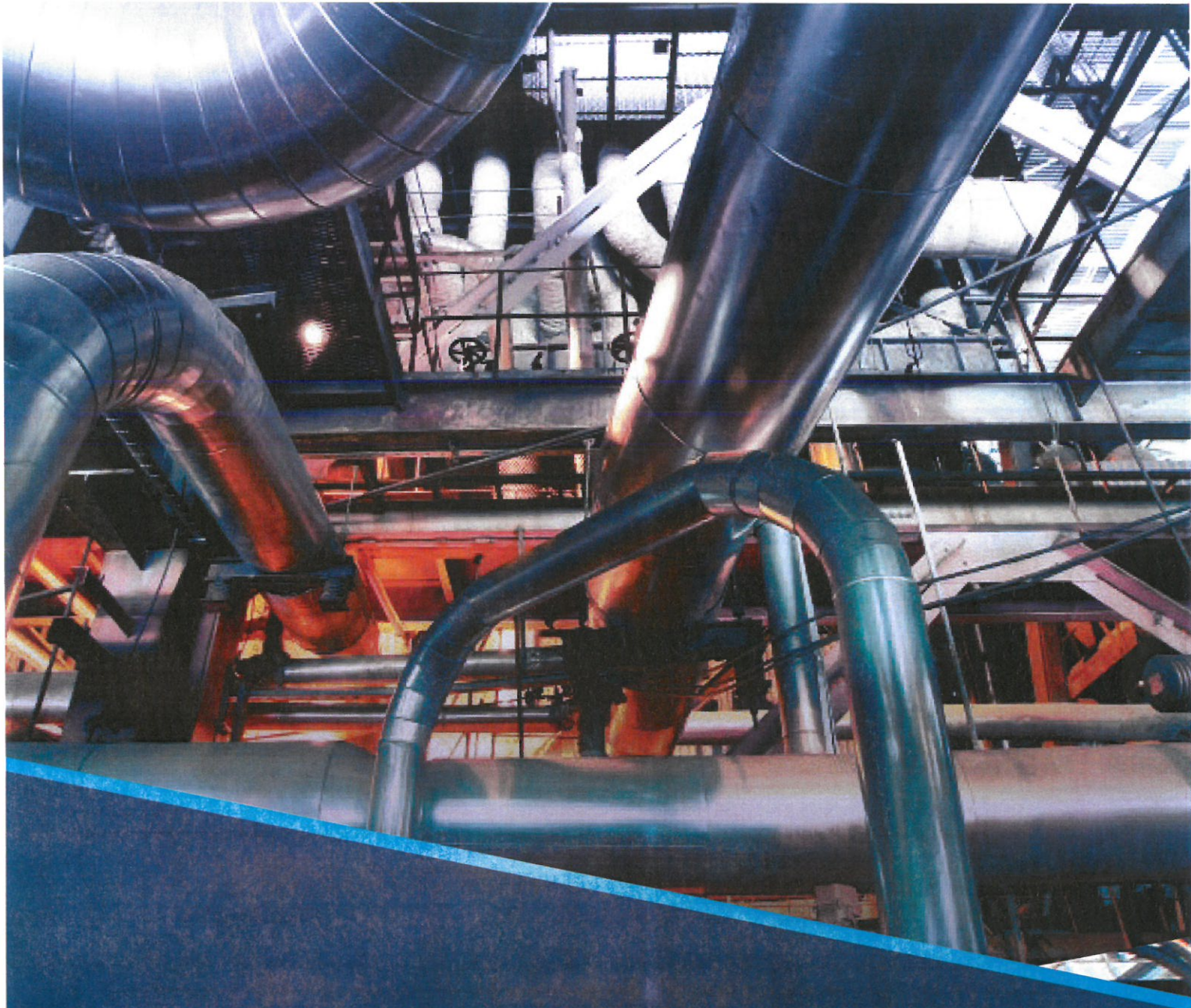
1. Before setting the bearings in action run them, if possible, for several hours with reduced speed and partial load, particularly in those cases where high speeds and loads can be expected later on.
2. After a running-in period of approx. 150 to 200 hours drain the oil and rinse the bearing with scavenging oil or benzine and fill with fresh oil.
3. Oil changes are recommended in longer intervals, though only topping up is prescribed for normal operation.
4. Dust and dirt deposits on the housing do not only offer a bad appearance but also prevent radiation of frictional heat. This refers particularly to bearings with fast running shafts. It is, therefore, recommended to keep the housing clean, also in such cases where they are totally enclosed or protected against penetrating of dust.



Viscosity of lubricants for M type sliding bearings									
Type	Viscosity ISO	Bore D in mm							
		35	40	45	50	55	60	70	80
		Range of speeds in min ⁻¹							
MMNF	VG 150	60..110	50..90	50..90	40..70	40..70	30..70	30..55	25..55
	VG 100	>110..280	>90..225	>90..180	>70..180	>70..140	>70..140	>55..110	>55..110
MMNL	VG 68	>280..3150	>225..3000	>180..2650	>180..2350	>140..2100	>140..1900	>110..1700	>110..1500
	VG 32		>3000..3150	>2650..2800	>2350..2800	>2100..2500	>1900..2500	>1700..2240	>1500..2000
MMWF	VG 150	>55..140	50..140	50..110	40..110	40..90	30..90	30..70	25..70
	VG 100	>140..350	>140..350	>110..280	>110..280	>90..225	>90..225	>70..180	>70..180
MMWL	VG 68	>350..3150	>350..3150	>280..2800	>280..2800	>225..2350	>225..2100	>180..1900	>180..1500
	VG 32					>2350..2500	>2100..2500	>1900..2240	>1500..2000
MSNF	VG 150		50..90	50..90	40..70	40..70	30..55	30..55	25..45
	VG 100		>90..225	>90..180	>70..180	>70..140	>55..140	>55..110	>45..110
MSNL	VG 68		>225..2800	>180..2500	>180..2500	>140..2240	>140..2240	>110..2000	>110..1800
	VG 150		>50..110	50..110	40..90	40..90	30..90	30..70	25..55
MSWF	VG 100		>110..280	>110..280	>90..225	>90..225	>90..180	>70..180	>55..140
	VG 68		>280..2800	>280..2500	>225..2500	>225..2240	>180..2240	>180..2000	>140..1800

Viscosity of lubricants for M type sliding bearings								
Type	Viscosity ISO	Bore D in mm						
		90	100	110	125	140	160	180
		Range of speeds in min ⁻¹						
MMNF	VG 150	25..45	20..45	20..35	16..28	16..22	12..22	12..18
	VG 100	>45..90	>45..90	>35..70	>28..55	>22..55	>22..45	>18..45
MMNL	VG 68	>90..1320	>90..1320	>70..1050	>55..1050	>55..950	>45..850	>45..750
	VG 32	>1320..1800	>1320..1600	>1050..1400	>1050..1400	>950..1250	>850..1120	>750..1000
MMWF	VG 150	25..55	20..55	20..45	16..35	16..35	12..28	12..28
	VG 100	>55..140	>55..140	>450..110	>35..90	>35..90	>28..70	>28..70
MMWL	VG 68	>140..1500	>140..1350	>110..1200	>90..1200	>90..950	>70..850	>70..750
	VG 32	>1500..1800	>1350..1600	>1200..1400	>1200..1400	>950..1250	>850..1120	>750..1000
MSNF	VG 150	25..45	20..35	20..35	16..28	16..28		
	VG 100	>45..90	>35..70	>35..70	>28..55	>28..55		
MSNL	VG 68	>90..1600	>70..1400	>70..1400	>55..1120	>55..1120		
	VG 150	25..55	20..45	20..45	16..35	16..35		
MSWF	VG 100	>55..140	>45..110	>45..90	>35..70	>35..70		
	VG 68	>140..1600	>110..1400	>90..1400	>70..1120	>70..1120		





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