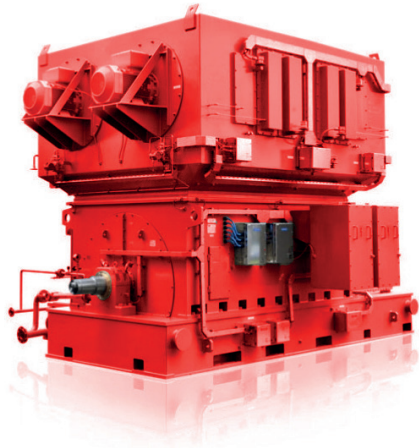


Preventive maintenance for synchronous machine WMT+56/63/71



Service

WMT+

Preventive maintenance aims to increase the reliability and extend the lifetime of machines by providing appropriate servicing at the right time. It consists of annual system inspections and component replacements based on a motor-specific maintenance schedule. The development of faults is a long process, so systematic preventive maintenances limit unplanned shutdowns. We recommend to replace diodes and snubbers during every major overhaul (L4).

Benefits

- Increased machine reliability
- Optimized maintenance costs and minimized repair costs
- Easy-to-plan maintenance budget
- Extended machine lifetime
- Genuine, factory-certified BM parts
- Preventive Maintenance kits based on extensive experience of requirements

Recommendation

Birr Machines recommends regular preventive maintenance over the entire lifetime of WMT+56/63/71 synchronous machines. This ensures maximum availability while minimizing unplanned repair costs.

Comprehensive maintenance

Preventive maintenance includes the labour and parts need to perform on-site work as specified by maintenance schedule:

- Visual inspection of the machine and it's operating environment
- Inspection of the connections
- Checking of the machine mounting bolts and alignment
- Inspection, testing and cleaning of the stator and rotor
- Inspection of the bearings and lubrication
- Inspection of the exciter and rectifier bridge
- Cleaning of the cooling system
- Inspection and / or testing of the accessories
- Inspection of the motor spare part inventory

Once the maintenance work has been completed and the inspection data is fully analyzed, a detailed service report is provided. This includes recommendation for further service actions and for spare parts and special tools for further actions. On-site training can be undertaken with maintenance work performed by an Birr Machines supervisor.

Prevention for preventive maintenance

The effectiveness of the preventive maintenance work depends on the quality of the information provided by the system owner in service reports. In general, preventive maintenance is more effective when the information provided is as comprehensive as possible. If the information available is not sufficient, it is recommended that a site survey is performed on the machine before the preventive is carried out.

During the shutdown Birr Machines must have free access to the motor for maintenance which must be planned well in advance in order to ensure that the required resources and service parts are available.

Maintenance Schedule

Experience indicates that machines become more likely to fail after a number of years in operation. In the case of synchronous machines this typically occurs after 5-10 years. The main reason is ageing of the components, but operating conditions also play a major role. Failure of a component may result in damage to other parts of the machine, including the stator and rotor.

The maintenance schedules are based on extensive know-how and they provide an effective and systematic means of maintaining a specific type of machine. The maintenance intervals are planned according to those of the motor to avoid unnecessary shutdown time. The maintenance schedules comply with any specifications issued by the component suppliers.

Environmental and operating conditions are also taken into account. Tough conditions such as high ambient temperatures, high vibration levels, humidity, dirt or heavy loads can significantly shorten component life times and reduce maintenance and component replacement intervals.

In order to ensure optimum performance over the entire lifetime of a machine, Birr Machines recommends that annual inspections are carried out in addition to regular maintenance.

Preventive Maintenance Category		Level 1 (L1)	Level 2 (L2)	Level 3 (L3)	Level 4 (L4)
	Operating time	Up to 1 year	1-2 years	3-5 years	8-12 years
1	Whole machine	I, T	I, T	I, T	I, T
2	Coupling, alignment and foundation	W, C	W, C, I, T	W, C, I, T	W, C, I, T
3	Bearings				
3.1	Measuring bearing clearances and visual checks inside the housing		I, T	I, T	I, T
3.2	Measuring bearing insulation and insulated bearing	I, T	I, T	I, T	I, T
3.3	Checking the properties of the oil		I, T	I, T	I, T
4	Stator				
4.1	Stator core			I, T	I, T
4.2	Stator coil over hangs & coil supports			I, T	I, T
4.3	Cables inside and outside machine		I, T	I, T	I, T
4.4	Winding insulation		I, T	I, T	I, T
5	Rotor				
5.1	Locking elements and connections			I, T	I, T
5.2	Accessible parts of rotor and winding			I, T	I, T
5.3	Shaft			I, T	I, T
6	Exciter				
6.1	Exciter Winding (rotor and stator)		I, T	I, T	I, T
6.2	Diodes and Snubbers		I, T	I, T	I, T, R
7	Winding diagnosis - optional	I, T	I, T	I, T	I, T
8	Main supply connections		I, T	I, T	I, T
9	Auxiliaries		I, T	I, T	I, T
10	Air – water heat exchanger				
10.1	Check of anodes and gaskets	I, T	I, T	I, T	I, T
10.2	Visual inspection of the water piping		I, T	I, T	I, T
10.3	Checking inner surfaces of cooling tubes		I, T	I, T	I, T
10.4	Inspection of the cooling motors		I, T	I, T	I, T
11	Purging				
11.1	Checking functions in acc. to manufacturers instruction		I, T	I, T	I, T
11.2	Maintenance actions and recalibrating in acc. to manufacturers instructions			W, C	W, C

Maintenance activities

Inspection	I
Maintenance Work	W
Test / Measurement	T
Replacement or reconditioning	R
Cleaning	C