Claims

1. A method of evaluating a wear state of an assembly of a flow machine, in particular a pump or turbine, wherein the assembly comprises a bearing arrangement comprising a mechanical seal and a tilting segment axial bearing with a tilting element arranged in a carrier body, and for determining a wear characteristic, a mechanical query signal having a predefinable signal shape is generated by means of a signal generator and a response signal generated from the query signal is detected by a sensor in contact with the assembly, wherein the response signal is changed in dependence on a variation of a physical operating value of the assembly in accordance with a characteristic pattern, wherein the wear characteristic is determined from the change in the response signal and wherein the wear state is evaluated using the wear parameter.

2. A method in accordance with claim 1, wherein the signal generator and the sensor are integrated in a sensor module.

3. A method in accordance with any one of the preceding claims, wherein the signal generator is additionally used as a sensor for the detection of the response signal.

4. A method in accordance with any one of the preceding claims, wherein the query signal is transmitted wirelessly to the signal generator by a signal source; and/or wherein the response signal is transmitted wirelessly to an evaluation unit.

5. A method in accordance with any one of the preceding claims, wherein at least one of the group consisting of the signal generator , the sensor and the sensor module comprise a piezoelectric material, in particular a piezoelectric monocrystal.

6. A method in accordance with any one of the preceding claims, wherein the physical operating value is a temperature, a pressure, a force, a torque, a rotational speed, a flow of a fluid medium and/or a spatial or temporal distribution of these values.

7. A method in accordance with any one of the preceding claims, wherein at least one of the group consisting of the signal generator , the sensor and the sensor module is/are provided in a rotating subcomponent of the assembly and/or at a stationary subcomponent of the assembly.

8. A method in accordance with any one of the preceding claims, wherein the bearing arrangement is a mechanical shaft bearing comprising a rotatable shaft arranged in a stationary bearing saddle.

9. A method in accordance with any one of the preceding claims, wherein the flow machine is controlled and/or regulated using the response signal.

10. An assembly for a flow machine, in particular a pump or turbine, for carrying out a method in accordance with any one of claims 1 to 9, wherein the assembly comprises a bearing arrangement comprising a mechanical seal and a tilting segment axial bearing with a tilting element arranged in a carrier body wherein, for determining a wear

characteristic, said assembly comprises a signal generator for generating a mechanical query signal and a sensor in contact with the assembly for detecting a response signal generated from the query signal so that a wear characteristic can be determined from a change of the response signal and the wear state can be evaluated using the wear characteristic.

11. An assembly in accordance with claim 10, wherein at least one of the group consisting of the signal generator, the sensor and the sensor module is/are provided in a rotating subcomponent and/or at a stationary subcomponent of the assembly.

12. An assembly in accordance with claim 10 or 11, wherein the assembly is a bearing arrangement in the form of a mechanical shaft bearing comprising a rotatable shaft arranged in a stationary bearing saddle; and wherein at least one of the group consisting of the signal generator, the sensor and the sensor module is/are provided at the rotatable shaft and/or at a bearing component of the stationary bearing saddle.

13. An assembly in accordance with any one of claims 10 to 12, wherein the assembly is a bearing arrangement in the form of a tilting segment axial bearing comprising a bearing segment arranged in a carrier body; wherein at least one of the group consisting of the signal generator, the sensor and the sensor module is/are provided at the carrier body and/or at the tilting element and/or at a segment body of the tilting element.

14. A flow machine, in particular a pump or turbine, having an assembly in accordance with any one of claims 10 to 13 for carrying out a method in accordance with any one of claims 1 to 9.

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