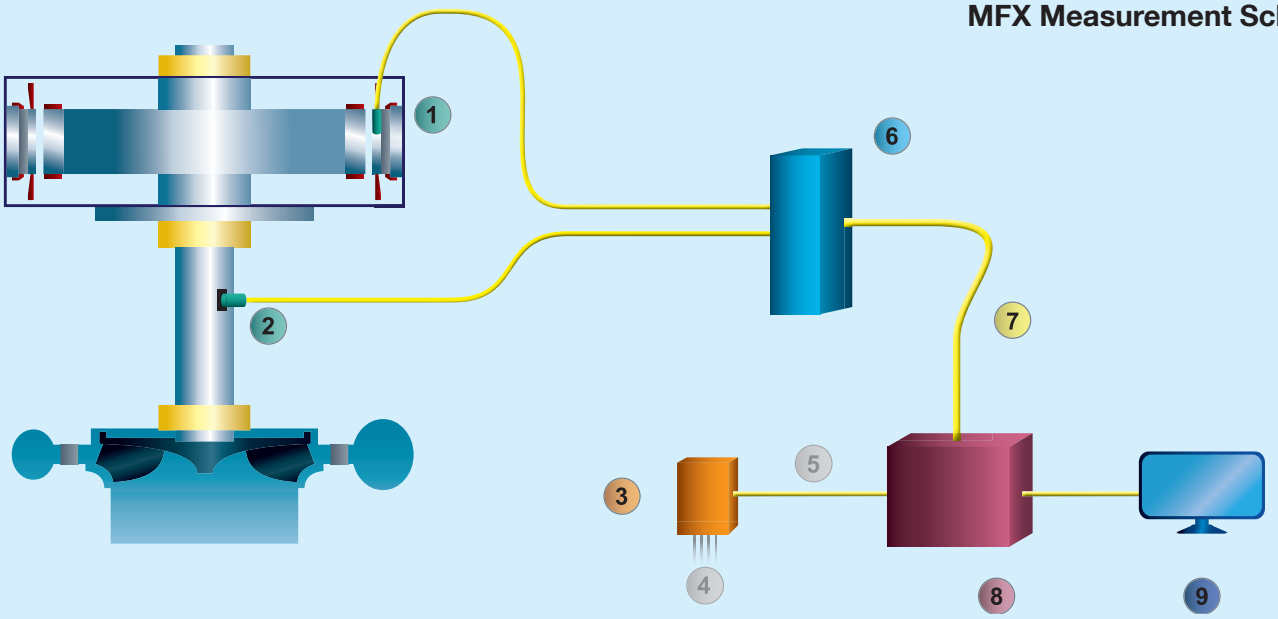
DIA TECH MFX
Magnetic Field Monitoring

MFX Measurement Scheme



1	2	3	4	5	6	7	8	9
Hall probe mounted on surface of stator bore	Phase Reference (Trigger)	SCADA (Supervisory Control and Data Acquisition)	Auxiliary Parameters	LAN	High-speed acquisition unit	High-speed data transfer	Monitoring Computer	Grafical User Interface

DIA TECH MFX enables the continuous on-line monitoring of magnetic field (or flux) characteristics of rotor poles in order to indicate short circuits in the turns. Changes of the magnetic field can cause magnetic imbalances and consequentially mechanical problems with the bearings.

By means of a magnetic field sensor and a phase-reference signal the related condition monitoring software provides magnetic field values of each pole separately. This kind of data processing allows a pole specific evaluation of its magnetic state. DIA TECH MFX is best suited for the salient rotor pole design.

Acquisition of measured values

One **Hall probe** per unit will be glued on the surface of stator bore to measure the magnetic field, which is generated in each rotor pole. The raw magnetic field signal is transmitted from the sensor to a proper processing unit, an analogue/digital converter (ADC), which acquires and pre-processes the magnetic field signals in high speed mode.

On a high-speed Ethernet connection the ascertained flux values are transferred to a computer, where a special software performs further signal processing.

Processing of measured values

The DIA TECH MFX software assigns the magnetic field values to each related poles, generates minimum-, maximum- and average values and sends them all to the data management package DIA TECH CORE for long-term storage and visualisation. Rotor current and rotor voltage supports the assessment process. In case of limit violation the DIA TECH MFX module generates a message, which is be displayed on the DIA TECH visualisation screen.

DIA TECH MFX

Magnetic Field Monitoring

Acquisition requirements:

Required hardware:

- Magnetic Field Transducer based on Hall element
- Phase reference sensor (Trigger or Keyphasor)
- High-speed A/D-conversion and processing unit

Auxiliary parameters for diagnosis

- Rotor current
- Rotor voltage

Main specification:

Number of measuring-points:
1 package of hardware and software is able to process 48 flux signals

Pre-processing at front-end ADC

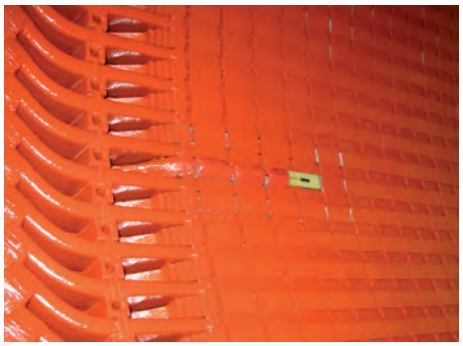
- 6 kHz sampling per sensor
- Low pass filter and average calculation
- Temporary buffering (in case of disconnection between ADC and PC)

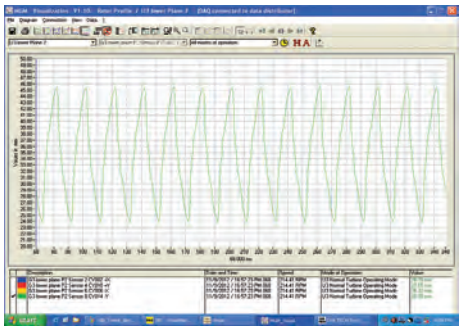
Processing at computer:

- Providing of magnetic field parameters:
- Flux value of each pole
- Min flux, max flux, average flux
- Maximum deviation, maximum standardized deviation
- Max standardized deviation offset

Limit monitoring (pre-warning, warning) upon
Maximum standardized deviation

System requirements:
DIA TECH MFX requires the data management software package DIA TECH CORE. All DIA TECH Modules are running on standard personal computers and a Windows®-based platform.





Available DIA TECH Knowledge Modules:

DIA TECH CAA-HS	(Cooling air analysis – hotspot detection)
DIA TECH CAA-O3	(Cooling air analysis – ozone diagnosis for surface partial discharge)
DIA TECH CAV	(Cavitation monitoring)
DIA TECH IRD	(Rotor pole temperature module based on infrared measurement)
DIA TECH MFX	(Magnetic flux monitoring)
DIA TECH MGM	(Machine gap monitoring module for air gap and turbine clearance)
DIA TECH RTMP	(Rotor winding temperature module based on calculation)
DIA TECH SBS	(Structure borne sound diagnosis for stator core vibration
DIA TECH ThM	(Thermal diagnosis for stator core & winding and cooling circuit)
DIA TECH CORE	(Data management package with graphical user interface)
DIA TECH TPOT	(Turbine / pump operation time counter)

DIA TECH is part of NEPTUN, the integrated common solution for secondary technology.

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