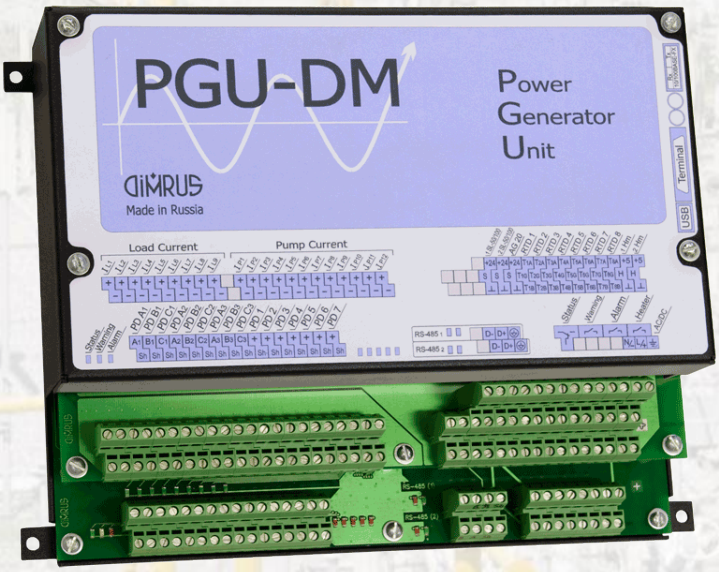
PGU-DM

The power generator condition monitoring and diagnostic system at the electric power plant

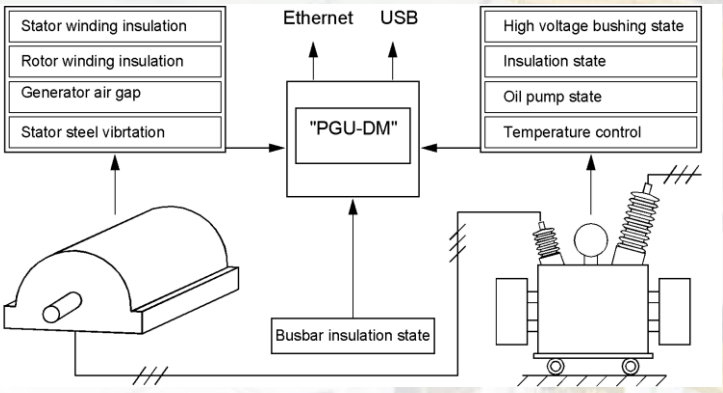


The diagnostic and monitoring system of the power unit or PGU-DM (Power Generator Unit - Diagnostics Monitor) is made for technical condition testing and defect diagnostics of the high-voltage equipment such as a generator, a transformer and a bus bar of the power unit at the cogeneration plant or a hydraulic unit at the hydropower plant.

The PGU-DM system was created on the base of one simple principle – one integrated object for one complex monitoring system. The PGU-DM system is the only one of such type and it has no match at the monitoring system market because of the service properties/development costs ratio.

The monitoring system PGU-DM monitors the following power unit subsystems:

- The generator stator winding insulation condition, the transformer bushing and winding condition and also the bus bar condition according to the level and distribution of partial discharges. The defect type and its place are found by the PD-Expert system.
- The rotor winding insulation condition on the base of the magnetic flow radial component analysis in the generator magnetic field.
- The positional check of the rotor in the generator stator backlash. It is monitored by two (for the turbogenerator) capacitor sensors SL-50. Much more sensors are used in the hydrogenerator.
- The insulation condition of the three transformer high-voltage bushings in the power unit according to conduction currents and tgδ and «C1» bushings size analysis.
- The power unit load parameters to specify the diagnostic results of the monitoring system.
- The transformer temperature environment.
- The oil pumps condition in the cooling system of the transformer.
- The current breaker condition.



The power unit condition analysis is made by the expert system built in the software. It gives the user not only the source information but the complete diagnostic reports necessary for the repair and maintenance service planning.

The special software for PC is the part of the «PGU-DM» delivery set. This software helps to get all necessary data from the monitor system primary device, to archive it, to screen it in different graphs, diagrams, symbolic circuits and condition signals. Due to the software it is possible to make some additional power unit condition analysis and detect the long-term trends in the technical condition changes. The data is transmitted from the primary device to the automatic monitoring system of processing by the standard optical transmission line.

In the complete set of the PGU-DM monitoring system there are 32 primary sensors of different functions that can be set on the controllable electro-technical equipment of the power unit. The most number of these sensors is developed and produced by «DIMRUS» company.

The monitoring system PGU-DM is mounted near the transformer or the generator in an assembly case. The maximal connection cable length (from the device to the part with primary sensors) can be up to 70 meters.

The PGU-DM monitoring system can work without any heater at temperatures from 40 degrees below zero and with the heating system at temperatures from 55 degrees below zero.

Specifications

№	Parameter	Measuring range
1	Parameter of the fault relay output contact	5A, 220V
2	Connection with the SCADA system	RS-485, Ethernet
3	Supply voltage, V	AC/DC 120 ÷ 260
4	Power consumption, subject to heater, W	200
5	Dimension, mm.	730x500x250