

# IDD<sup>®</sup>



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## **IDD<sup>®</sup> INTELLIGENT DIAGNOSTIC DEVICE FOR DISSOLVED GAS IN OIL ANALYSIS (DGA)**

### **Introduction**

The industry has come to rely on dissolved gas analysis to assess the condition of oil filled transformers. It's so effective that some utilities employ on-line monitors to continuously measure the gas content in their transformers' insulation fluid. Yet on-line monitors provide just part of the solution needed to insure reliable operation; the data still needs to be reviewed by an expert to analyze its meaning.

The **IDD for DGA** provides the ideal solution for complete on-line dissolved gas analysis. This system captures information from a gas sensor (not included), performs additional calculations, evaluates the results, provides data storage and- if necessary - notifies of impending problems.

### **Why should you use On-line Diagnostics?**

On-line monitors are often implemented with the expectation that an improved assessment of the apparatus will be achieved with fewer engineering resources. However these monitors produce enormous amounts of data, and it's not practical to manually process this information. To realize the true potential of the monitor, an additional step is needed to automatically process the data and notify you when action is required. The Doble Expert System automates the evaluation task, creating a bridge from an on-line monitoring system to an on-line diagnostic monitor. The Doble Expert System in the **IDD for DGA**, validates data, detects changes, confirms the anomalies, assesses severity and recommends appropriate action.

The **IDD for DGA** allows users to combine the measuring capability of an on-line dissolved gas in oil monitor with a comprehensive diagnostic system. The resulting system provides early detection of problems and a mechanism for determining when maintenance is truly required.

### **IDD for DGA Features**

- **Continuous Assessment of Dissolved Gases** – the **IDD for DGA** is constantly working to retrieve information from the sensor, calculating the total gas generated and rate of change, interpreting the data, and sending notifications of impending problems.
- **Diagnoses Severity of Problem** – the rate of change of dissolved gas is often the most relevant indication of transformer condition. The **IDD for DGA** evaluates this critical factor for diagnosing the severity of abnormalities.
- **Comprehensive Analysis** – by employing four trending cycles (short, medium, long and very long) the diagnostic analysis can identify a complete range of problems. This includes high rate of gas generation and short gestation periods, to low levels of gas production over long periods of time.
- **Detailed Alert Messages** – the **IDD for DGA** issues a series of alerts based on the dissolved gas levels and rates of generation. It starts with early warnings to identify when serious problems appear to be rising. Alert messages indicate the problem, recommend appropriate action, indicate urgency and provide supporting evidence.



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## Description

One **IDD** can support multiple applications. A single **IDD** can be used to analyze Bushings, **DGA** and Moisture.

Every 60 minutes, the **IDD** records the gas concentration as assessed by the on-line gas monitor. Since monitors only measure the gas

concentration in the oil, the **IDD** analysis is needed to compensate the measurements for gases that may have escaped the insulating fluid, before it determines the rate of change. The algorithm used to calculate the total gas produced is dependent on the oil preservation system.

Once the total gas is determined, the **IDD for DGA** calculates the rate of change over four cycles; 1 day (short cycle), 3 days (medium cycle) and two long cycles (30 and 300 days). The rate of change is compared to various limits. These thresholds are based on the level of gas in the transformer, the cycle used to calculate rate of change

and uncertainty of the data. Alerts are issued when the rate of change exceeds these limits.

## IDD® for DGA

### Technical Specifications

**Power Supply:** 90 - 264 volts, 47 - 63 Hz or 100 - 280 Vdc

#### Environment:

**Surge withstand** ANSI/IEEE C37.90.1-1989 (R1994)

**ESD** EN 61000-4-2

**Ambient Operating Temp** -40° to 50° C

**Shortage Temp** -40° to 85° C

**Humidity** 5% to 95% non-condensing

**Physical dimensions:** 17.25 in. H x 15.25 in. W x 3 in. D  
43.8 x 38.7 x 7.6 (cm) for control cabinet mounting

## Continuous Diagnostics

The **IDD for DGA** is designed to operate reliably under extreme weather conditions and electrical interference found in normal substation operations. Self-diagnostics continuously tracks the condition of the **IDD for DGA** and issues alerts if an abnormality is detected in the system. Diagnostics also validates the information supplied by the gas monitor; only values determined to be valid are used in the calculations made by the **IDD**.

## On-line Monitors

The **IDD for DGA** does not include an on-line dissolved gas monitor. One must be purchased separately as Doble does not offer dissolved gas monitors. Contact your local Doble representative for a list of monitors that are compatible with the **IDD for DGA**.

*Specifications are subject to change.*

