

DELPHI



DISSOLVED GAS ANALYSIS INSTRUMENTS

The Doble Delphi is a dissolved gas analysis (DGA) monitor that helps you track transformer health by providing early warning signs of problems such as overheating, insulation degradation or mechanical movement within the unit. The Delphi provides this valuable information in real time, second by second. The Delphi is immune to oil surges and vacuums that may affect other sensors; in addition, the Delphi contains self-testing diagnostics to monitor its own performance. Use the Delphi as part of your comprehensive fleet management program or to monitor smaller transformers in a cost-effective manner.



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Benefits

- Cost-effective updates on transformer health between regular DGA samples
- Alerts you when there is a sudden change in DGA levels due to a developing fault within the transformer
- Notifications give you time to plan instead of reacting to a failure
- Actionable intelligence helps you determine what steps to take: maintenance, testing, load management or replacement

Key Features

- Patented vacuum resistant membrane prevents failure during oil surges, maintenance or other activities
- Available as a composite gas monitor or hydrogen monitor in standard, mini and stand options
- Self-testing provides assurance of reliable results
- Built-in pump for standard or stand Delphi models is used for forced circulation of oil when the flow in the main transformer pipework may be slow
- Optional moisture sensor is available for more comprehensive monitoring and loading decisions

Technical Specifications

| Measured Values | | |
|---|---|------------|
| Gas | Percentage | Range |
| Hydrogen | 100% | 0-5000 ppm |
| If composite, Hydrogen and these additional gases: | | |
| Carbon Monoxide | 10-20% | |
| Acetylene | 10-20% | |
| Ethylene | 2-8% | |
| Accuracy, Limit of Detection, Response | | |
| Accuracy | 2 ± 10% reading or ± 20 uL/L (ppm), whichever is greater | |
| Limit of Detection | H2 = 10 uL/L (ppm) at 99% confidence level | |
| Response time to 80% step change | ≤ 10 minutes | |
| Response time to 100% step change | ≤ 60 minutes | |
| Operating Environment | | |
| Oil Pressure at sensor | Can with stand absolute vacuum to 0.7 Mpa (100 psi) | |
| Outdoor protection | Meets IEC 60529, IP 55 | |
| Vibration | Meets IEC 68-2-5 | |
| Mechanical | Brushed aluminium enclosure | |
| EMC | Meets IEC 61000-4-2/4/5/8, Grade 4 | |
| High & low temperatures | Meets IEC 68-2-1 & 68-2-2 | |
| Electronics temperature range | -40 to 60°C (-40 to 140°F) | |
| Sensor Temperature Range | | |
| Gas Sensor | -20 to 70C (-4 to 158F) at sensor face, -20 to 105C (-4 to 221F) with finned attachment | |
| Optional Water Sensor | -40 to 180C (-40 to 356F) | |
| Standards | CE marked RoHS compliant | |

Inputs and Outputs

| Standard Output | RS485, 1200m | |
|--------------------------------|--|--------------------------------------|
| | Gas Version | Moisture version |
| Channel 1 | Gas Level (Scaled 0 - 5000 ppm) | Gas Level (Scaled 0 - 5000 ppm) |
| Channel 2 | Hourly Trend (Scaled 0 - 5000 ppm) | Water Content, %RS (Scaled 0 - 100%) |
| Optional Output | RS485/232 | |
| Dry Contacts | 2 - 3 Rating: 5A/240VAC | |
| Alarm Types | Normal Gas Hi Gas Hi-Hi (also indicated on front panel) | |
| External Alarm Indicators | Green = Normal Orange = High Red = High-High | |
| Host PC Software | Support Networking Windows 2000/XP/7 | |
| Additional Details | | |
| Weight | Valve Mounted = 15kg/34lbs Stand Mounted = 20kg/45lbs Mini = <5kg/<11lbs | |
| Hardware & Firmware | Microprocessor, watchdog and real-time clock with embedded firmware | |
| Enhanced Oil Flow | Use of micro-pump with inlet and outlet ports to force circulation | |
| Popular Valve Mounting Options | DN50 (Metric) 2 inch NPT (English) | |

Ordering Information

| Part Number | Product |
|-------------|--|
| DFV-CGW | Delphi, valve mounted, Composite Gas Sensor |
| DFS-CGW | Delphi, stand mounted, Composite Gas Sensor |
| DFV-HW | Delphi, valve mounted, Hydrogren Sensor |
| DFS-HW | Delphi, stand mounted, Hydrogen Sensor |
| DV-CG | Delphi mini, Composite Gas Sensor |
| DV-H | Delphi mini, Hydrogen Sensor |
| Accessories | |
| 230-0242 | DN50 Valve Coupler (for metric sized valves) |
| 401-0415 | DOEM162-Tppm - Domino sensor module for OEM applications, powered by 10 to 35 VDC, measures temperature from -40 to 100C and ppm up to 200 through two 4 to 20 mA outputs, connection is ½ inch male NPT |
| | <i>Adapters available in common valve sizes for each device.</i> |

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