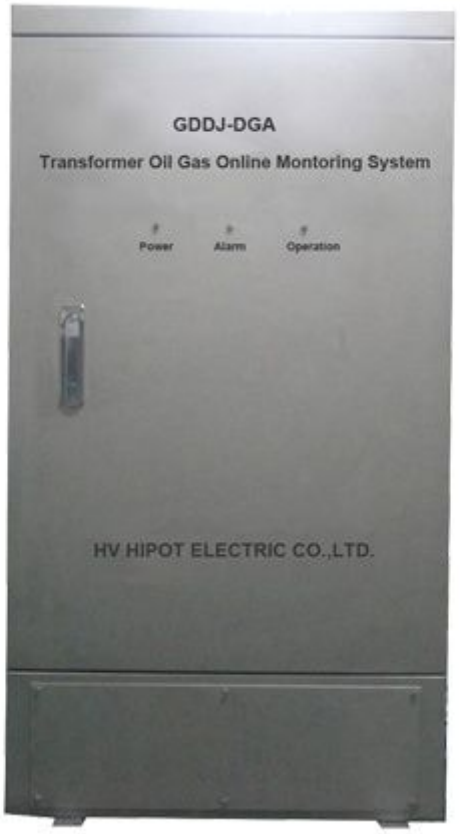
**GDDJ-DGA Transformer Oil Gas Chromatography Online Monitoring System (9 components & H2O)**




## General Information

GDDJ-DGA Transformer Oil Gas Analyzer is an online monitoring device for dissolved gas in transformer oil based on gas chromatography technology. Potential fault are determined, release alert as per preset value through expert diagnosis system.

The device adopts distributed control sampling technology and has self-diagnosis and self-recovery functions. Each function module is weak coupling, function independent, adopting rack structure, easy for engineering maintenance.

## Fetures

- Maintenance-free, no need to replace gas cylinder.

- On-line detection the concentration and growth rate of $H_2$, CO, $CO_2$, $CH_4$, $C_2H_4$, $C_2H_2$, $C_2H_6$.
- Modular design and compact structure, easy for maintenance, with high expansibility, can be easily integrated to other monitoring equipment.
- Quantitative cleaning cycle sampling mode, to reflect the state of dissolved gas in transformer oil.
- Pumpless vacuum degassing technology, no need vacuum pump and improve reliability and stability of system.
- Special complex chromatographic column, to improve the separation degree of the gas composition.
- Special linear detector, monitoring data is real and reliable, test results are very close to the laboratory data.
- Independent unit within chassis to control temperature and humidity, to remove regional and seasonal influence.
- With high data acquisition precision, it adopts △-ε 24-digit ADC and digital filter. It uses auto calibration to collect spectrogram.
- With various data display and query modes, report and trend graph. Historical data can be saved up to 10 years.
- Strong environmental adaptability, successful application in the cold, high temperature, high humidity, high altitude area.
- Strong anti-interference ability, electromagnetic compatibility can satisfy the relevant standard.
- With two levels of alarm function, the alarm signal can be far transmitted.
- Faster analysis cycle, minimum monitoring cycle is 40 minutes, can be set by users.

- Complete oil return technology, during the degassing process, oil sample does not contact the chromatogram carrier gas, the use of various means of control, to ensure that the return transformer body of the oil sample fully meet the requirements.
- Strengthened system diagnosis system, results are given through improved three-ratio method, David triangle method and cube diagram method.
- With various communication methods to transfer data, RS485, IEC61850, GPRS wireless transfer and short message are applied to transfer data.
- Support Ethernet/optical connection, data transfer, device control and parameter setting with fully digitalization and remote control.
- Oil/gas auto calibration and auto cleaning functions are available.

**Specification**

| | |
|---|---|
| Environmental temperature | -40℃～+70℃ |
| Environmental humidity | Relative humidity 5-95%(no condensation) |
| Atmospheric Pressure | 80kPa-110kPa |
| Power supply | AC 220V±10%, 50Hz |
| Monitoring components | $H_2$, CO, $CO_2$, $CH_4$, $C_2H_4$, $C_2H_2$, $C_2H_6$, $H_2O$, growth rate and concentration |

| | | | |
|---|---|---|---|
| Analysis and diagnostic function | Analyze and diagnose monitoring data by three-ratio method, David triangle method and cube diagram method. Original spectrogram can be supplied. | | |
| Min. Detection cycle | 40-60mins, user-defined, default four times a day. | | |
| Sampling mode | Cycling sampling, to reflect real-time situation of inside gas. | | |
| Separating mode of oil and gas | Vacuum degassing mode, degassing for three times continuously. | | |
| Data storage lifespan | ≥ 10 years | | |
| Carrier gas quantity | Self-made carrier gas, not interrupted all year round. No need to replace gas cylinder. | | |
| Monitoring gas | Measuring range | Min. detection | Error |
| $H_2$ | 2- 2000 ppm | 1 ppm | ±10% |
| CO | 5- 20000 ppm | 5 ppm | ±10% |
| $CH_4$ | 0.2- 2000 ppm | 0.2 ppm | ±10% |
| $C_2H_4$ | 0.2- 2000 ppm | 0.2 ppm | ±10% |
| $C_2H_6$ | 0.2- 2000 ppm | 0.2 ppm | ±10% |

| | | | |
|---|---|---|---|
| $C_2H_2$ | 0.2- 2000 ppm | 0.2 ppm | ±10% |
| $CO_2$ | 25- 20000 ppm | 25 ppm | ±10% |
| $H_2O$ | 1 - 800 ppm | | |
| Oil temperature | -40℃~200℃ | | |
| Total air quantity | 0.2-15% | | |
| Total hydrocarbon | 1 - 8000 ppm | | |
| Stability (measurement error) | At the same testing condition, error is no more than 10% for the same oil sample. (medium concentration) | | |
| IP class | IP66 | | |

**Use conditions**

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|---|---|
| Altitude | ≤3000m |
| Ambient temperature | -10℃~+45℃(indoors); -40℃~+70℃(outdoors) |
| Max. daily temperature difference | 25℃ |
| Max. relative humidity | 95% (daily average); 90% (monthly average) |

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|---|---|
| Air pressure | 86kPa~106kPa |
| Anti-shock ability | Horizontal acceleration 0.30g; vertical acceleration 0.15g |
| Installation environment | Indoor installation. The room shall be equipped with air-conditioner, no shielding, without anti-static measures. |

**Rated parameters**

| | |
|---|---|
| Rated power supply (AC) | 220V/100V, permissible error ±20% (harmonics), total voltage distortion rate ≤8%. |
| Rated power supply (DC) | 220V/110V, permissible variation range ±20%. |
| Rated AC voltage | 57.7V/100V/220V, overload capacity is 1.2times of rated voltage, peak coefficient ≥2. |
| Rated AC current | 1A/5A, overload capacity is 1.2 times of rated current, continuously working, peak coefficient ≥3. |
| Rated frequency | 50Hz, permissible error -5%~+5%. |

- Power supply

The power supply of the substation condition monitoring system should be safe and reliable, and the station control layer equipment should be powered by 220VAC

Uninterrupted Power Supply (UPS). Each monitoring unit in the process layer is powered by 220V AC system.

- Lightning protection, grounding, anti-interference

The substation condition monitoring system shall have protective measures against over-voltage.

There is no separate grounding grid for the condition monitoring system. According to the principle of "one-point grounding", the ground wire is connected to one point of the main grounding grid of the substation.

Over-voltage protection device shall be installed on 220V AC power supply, communication line and the leading end of the grounding network, and the protection device parameters shall conform to the insulation performance index of the equipment.

The chassis, cabinet and cable shielding layer of the condition monitoring system should be grounded reliably. The connection between the process layers of the condition monitoring system, the connection between the process layer and the station control layer, and the connection between the communication ports of the equipment shall be isolated.

The device is installed in a room without electromagnetic shielding. The device itself should meet the requirements of anti-electromagnetic field interference and electrostatic influence. In case of lightning overvoltage, operating overvoltage and short-circuit fault of the primary equipment, the equipment shall not mal-operate, and all equipment shall meet the following anti-interference requirements:

1) For electrostatic discharge, it conforms to GB/T 17626-4-2 class 4.
2) For the radiation electromagnetic field, it conforms to the GB/T 17626-4-3 class 3.
3) For fast transient, it conforms to GB/T 17626-4-4 class 4.
4) For surge, it conforms to GB/T 17626-4-5 class 3.
5) For conduction of electromagnetic induction, it conforms to GB/T 17626-4-6 class 3.
6) For power frequency electromagnetic field, it conforms to GB/T 17626-4-8 class 4.

7) For the pulse electromagnetic field, it conforms to GB/T 17626-4-9 class 5.
8) For damped oscillating magnetic field, it conforms to GB/T 17626-4-10 class 5.
9) For oscillating waves, it conforms to GB/T 17626-4-12 class 2 (signal port).

## Accessories

| No. | Equipment Name | Specifications | Qty | Remark |
|---|---|---|---|---|
| 1 | Transformer Oil Gas Online monitoring system | 535*600*1100 | 1 | |
| 2 | Flange | Based on the port of transformer | 2 | |
| 3 | Stainless steel tube | Φ6*30M | 1 | |
| 4 | Optical fiber | Multimode 4-core, 200M | 1 | |
| 5 | Terminal box | | 2 | |
| 6 | Jumper | SC-SC | 2 | |
| 7 | Fiber converter | multimode | 1 | |
| 8 | Ethernet cable | 0.5M | 2 | |
| 9 | Screw | M12*1.25M, Φ6 | 2 | |

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|---|---|---|---|---|
| 10 | Expansion screw | M10*100 | 4 | |
| 11 | Cabinet key | 2pcs | 1 | |
| 12 | Cable card | 4pcs+several nylon cable ties | 1 | |
| 13 | Stainless steel tube | Φ3*2M | 1 | |
| 14 | Insulation Pipe and other components | Insulation pipe Φ6*2M 4pcs, Au tape 50*25M 1roll, stainless steel hoop 8*32 2pcs | 1 | |