

NVSDGM

Transformer Oil Dissolved Gas Monitor



Your Trustworthy Partner for Electrical Diagnostic System

Dissolved gas monitor device measuring gas concentration and H₂O for oil-immersed transformers provides a real time inspection for early detection on faults in transformers

BENEFITS

• PAS(Photo Acoustic Spectroscopy)

- Enhanced product life cycle
- Easy & affordable maintenance
- No need for carrier gas
- Minimized spare parts
- Simple structure, high accuracy, less failure
- Stabilized with wide measuring range

※ PAS(Photo Acoustic Spectroscopy) :
 a most cutting-edge method of analyzing gas by means of the effect of absorbed light energy on gas with acoustic detection

• i-DGMS

(*intelligent* Dissolved Gas Monitoring System)

- Local S/W allows data collecting program for transformer faults
- Operation settings, graphics and data management
- Set up a diagnostic criteria

• Specification Upon Needs

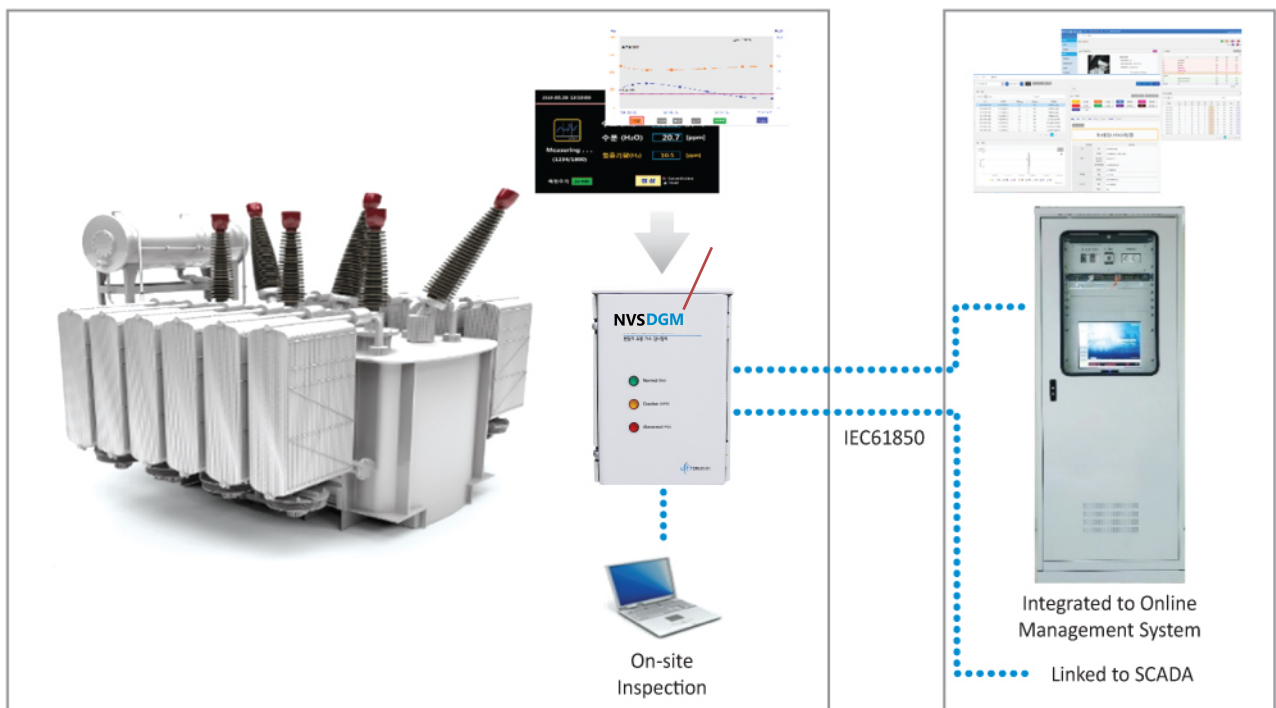
- Select up to 7 gases
- Gas selection considering transformer capacity, faults to be detected and types of insulation oil
- Transformer capacity :
 1 gas type, 3~7 gases type, multi-tank type
- Faults to be detected :
 H₂ / C₂H₂ / C_nH_m type, etc.
- Insulation oil(vegetable oil, non-flammable oil) :
 H₂ / C₂H₆ type, etc.

• t-DGMS

(*total* Dissolved Gas Monitoring System)

- Online t-DGMS allows monitoring and remote controlling in real-time
- Compatible with Online Electrical Asset Monitoring System
- Integrated to online GIS/TR monitoring system (i-TODs)

SYSTEM CONFIGURATION



NVSDGM 3~7

FEATURES

- Measuring gas : H₂, CH₄, C₂H₆, C₂H₄, C₂H₂, CO, CO₂ (H₂O)
- Measuring method : PAS, semiconductor sensor
- LCD(7.0") : operational data, test and diagnosis result
- LED : Power / Device Error / Gas Alarm
- Settings : operating time & cycle, diagnostic criterion
- Measuring cycle : min. 1hr
- Diagnosis of transformer fault based on gas concentration and trend



NVSDGM3T

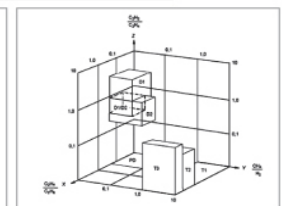
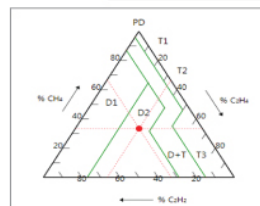
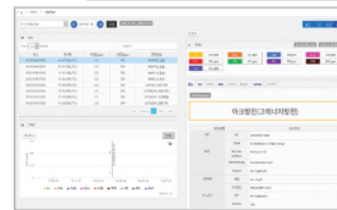
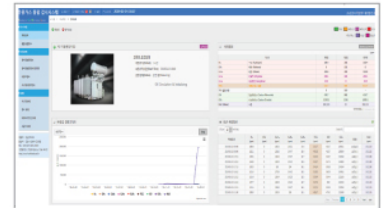
FEATURES

- 3 tanks in 1 monitor - minimized installation space
- Measuring without contaminating oil or gas
- LCD(7.0") : operational data, test and diagnosis result
- LED : Power / Device Error / Phase A, B, C Gas Alarm
- Settings : operating time & cycle, diagnostic criterion
- Measuring cycle : min. 3hr
- Applicable to 3 phase transformer



t-DGMs (Online DGA Monitoring S/W) (Optional)

- Remote monitoring in real-time
- Remote control on operational data and settings
- Diagnose concentration and trend in fault gases
 - Normal/Abnormal/Warning
- Evaluates degradation in progress by CO and CO₂
- Creates a report on diagnosing result with DB and graphics
- Event alert with diagnosis of transformer
- Integrated diagnosing methods
 - Algorithm learning from accumulated test results (KEPCO, IEC, IEEE, Duval's Triangle, etc.)
 - Analyze faults in transformer (PD, thermal degradation, arcing, etc.)



Category	Test	Result
Electrical Test	IEC 60255-5 (Insulation Resistance Test) IEC 60947-5-2 Clause 8.3.3.4 or IEC 60950-1(Power Frequency Voltage Test)	Pass Pass
Environmental Test	IEC 60068-2-6 (Test Fc: Vibration (sinusoidal)) IEC 60068-2-1 (Test A: Cold) IEC 60068-2-2 (Test B: Dry heat) IEC 60068-2-30 (Test Db: Damp heat, cyclic (12 h + 12 h cycle))	Pass Pass Pass Pass
Electromagnetic Compatibility (EMC) Test	IEC 61000-4-2 (Electrostatic discharge test) IEC 61000-4-3 (Radiated, radio-frequency, electromagnetic field immunity test) IEC 61000-4-4 (Electrical fast transient/burst immunity test) IEC 61000-4-5 (Surge immunity test) IEC 61000-4-6 (Immunity to conducted disturbans, induced by radio-frequency field) IEC 61000-4-8 (Power frequency magnetic field immunity test) IEC 61000-4-11 (Control Power Failure Test)	Grade A (Pass) Grade A (Pass) Grade A (Pass) Grade A (Pass) Grade A (Pass) Grade A (Pass) Grade A (Pass)
Ingress Protection Test	IEC 60529 (Ingress Protection Test) – Degrees of dust-proof/water-proof	IP55 / IP56 (Pass)

TECHNICAL SPECIFICATIONS

	Composition	Measuring Range (customizable)	Model	
			HanbitDGM 3 ~ 7	HanbitDGM 3T
Measuring Gases	H ₂ (Hydrogen)	5 ~ 5,000 ppm	○	○
	CH ₄ (Methane)	1 ~ 5,000 ppm	○	○
	C ₂ H ₆ (Ethane)	1 ~ 5,000 ppm	○	○
	C ₂ H ₄ (Ethylene)	1 ~ 5,000 ppm	○	○
	C ₂ H ₂ (Acetylene)	0.1 ~ 5,000 ppm	○	○
	CO (Carbon monoxide)	1 ~ 10,000 ppm	○	○
	CO ₂ (Carbon dioxide)	0 ~ 10,000 ppm	○	○
	O ₂ (Oxygen), N ₂ (Nitrogen) ※ Optional			
	H ₂ O (Moisture)		○	○
Measuring Range	Min. ~ Max. (full range calibration) / H ₂ O : 0~100 % (Relative Humidity) (in ppm)			
Measuring Cycle	Minimum		1 hr / cycle	1 hr / cycle
Dimensions / Weight	W x H x D (mm) / (kg)		460 x 700 x 332 / 54kg	480 x 700 x 350 / 65kg
LED Alert	Enclosure Embedded		Power ●, Device Error ●, Alarm ●	Power ●, Device Error ●, Alarm ●●●
LCD Display	7 inch screen with 6 function keys			
Measuring Method	Photo Acoustic Spectroscopy(PAS), Semiconductor Sensor			
*Accuracy	Less ±5 % or LDL (Repeatability: ≤ 1%)			
Operating Ambient Conditions	Temperature	-40 ~ 60 °C		
	Humidity	0 ~ 95 % RH		
	Oil Temperature	-20 to +100°C		
	Altitude	Under 1,500m		
Software	Online Monitoring: t-DGMs (DGA only) or i-TODs (Asset Monitoring) Local S/W: i-DGMs			
Diagnosing Methods	KEPCO, IEC, IEEE, Duval's Triangle, Roger's Ratio, Key Gas, Doernenburg, etc (for t-DGMs & i-TODs only)			
Power	110~240 Vac / 50~60 Hz or 120 ± 20% Vdc			
Enclosure	IP56, SUS304 with paint coating			
Communication	Protocol	IEC61850®, MODBUS®, MODBUS/TCP, DNP3.0, RS485		
	Port	Standard 1Gb Ethernet (RJ45)		
Output	3 Digital Relay Output (Output sorts and quantities are customizable) 1 Lan port for local connection to PC			
Optional Accessories	Mounting Stand, Communication Box, Sun Canopy			

*Accuracy is based on test results from standard gas in calibration.