

emt 
asset protection specialists

www.emt.uk.com

World leaders in SF₆, Oil Analysis and Handling Products

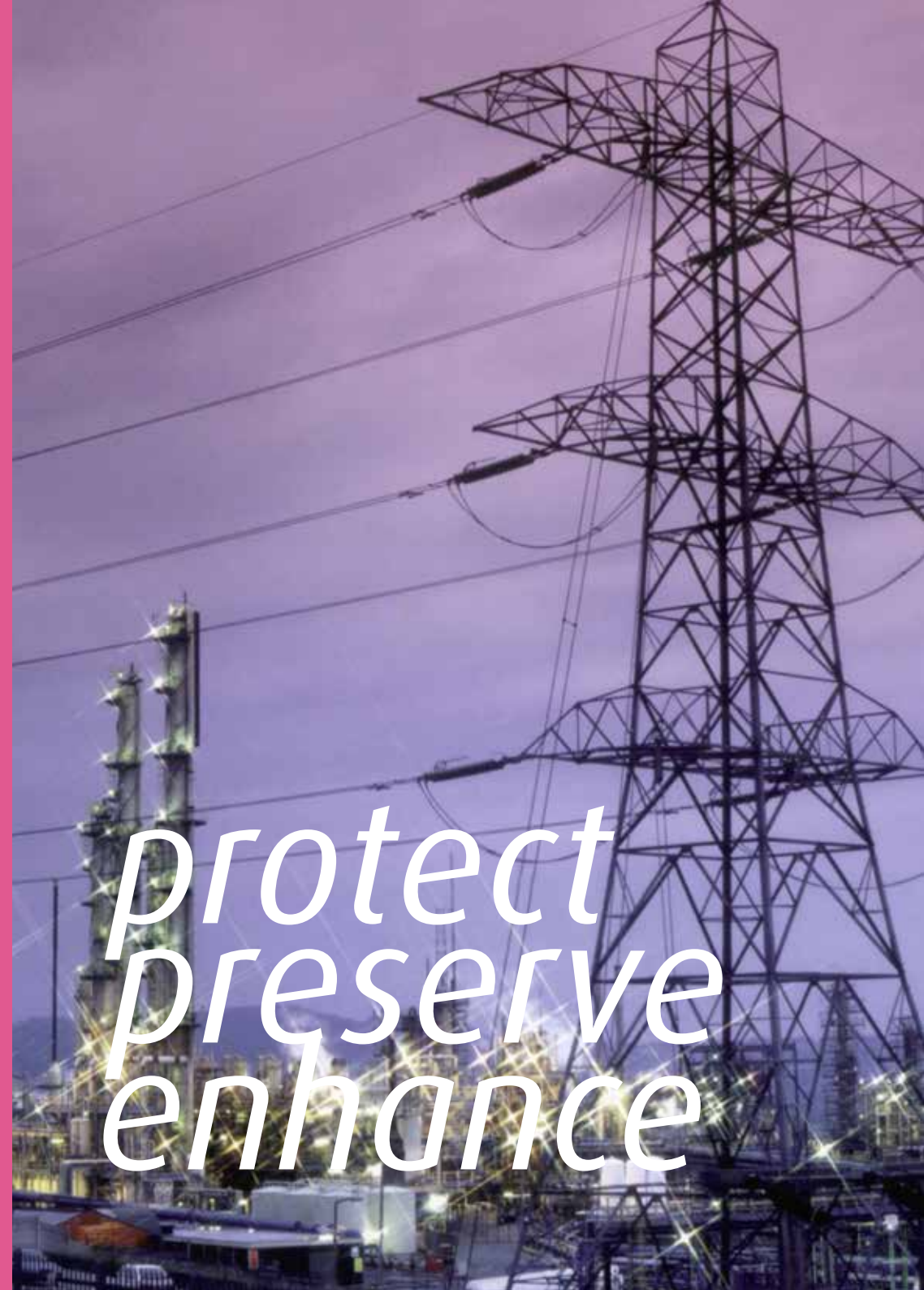
Energy Maintenance Technologies Ltd.



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“The Asset Protection Specialists”



*protect
preserve
enhance*



Introduction

Welcome to Energy Maintenance Technologies Limited, Asset Protection Specialists to the Electricity Supply Industry (ESI).

Asset Protection: People + Plant = Protect, Preserve + Enhance

EMT supply a range of SF6 and oil testing instrumentation, consumables and related services for Condition Monitoring in T&D. These instruments maintain and support personnel, whose role is to protect, preserve and enhance the life of people, plant and equipment assets within their responsibility.

Scientific Approach = World Leading Technology for SF6

Present and future plant - SF6 filled switchgear and circuit breakers require high quality purity insulating oils and Sulphur Hexafluoride (SF6) gas at the point of use. With the increasing voltage and temperature stresses of modern plant, mounting pressure from Environmental & Political forces and the Economic & Financial constraints influencing Asset Management Strategies, it is imperative that insulating medium within plants is properly maintained and serviced at regular intervals. Testing & Maintenance of existing SF6 filled equipment is often chosen over replacement making SF6 Testing, Recycling & Leak Detection more critical than ever. The EMT range of Oil & SF6 testing products deliver world leading technologies developed and manufactured in collaboration with industry professionals from around the world, are specifically able to meet the needs of predictive maintenance personnel.

Experience + Consultative Approach = Peace of Mind

With over 50 years experience delivering high voltage technology products to the electric utility market, no one is more qualified than EMT to meet the needs of the industry. We understand the practical issues and concerns of end users, with products developed specifically to meet the needs of utility managers. EMT can help you get the most from your valuable assets by discussing and understanding your challenges and providing appropriate cost-effective solutions. Our team of experienced professionals have



spent many years developing solutions to meet utilities challenges, and are unrivalled in their knowledge of the industry and legislative compliance. We are driven to develop the very best technologies which will significantly improve handling practices adopted by maintenance personnel.

Global Reach = Local Sales + Support

SF6 analysers are the essence of our business. Our focus allows us to be flexible and responsive to our clients' needs, and as specialists in this field, our consultative approach backed by training and education means that challenges are resolved with real solutions that not only meet the end goal but also deliver a host of additional benefits on every level. This is why EMT products are available in over 70 countries, and many of the world's largest utility companies, SF6 asset suppliers, and gas suppliers have chosen EMT for their asset protection needs.

Neil Kane

Neil Kane
Managing Director



Pioneers in SF6 Analysis ...

SF6 Testing & Maintenance

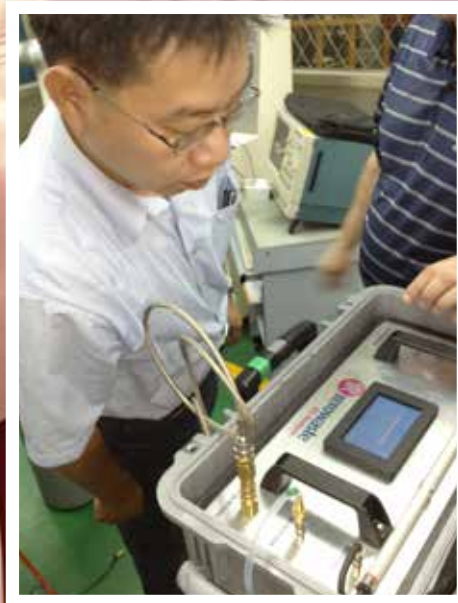
EMT delivers the most advanced and complete range of SF6 analysis and handling products, aligned to global trends in the electricity generation, transmission and distribution sectors. These products monitor the health and longevity of critical assets in high voltage systems and facilitate the effective management of maintenance, operation and planning.

EMT SF6 Analysers give you ...

- effective controls on SF6 inventory and usage
- accurate monitoring and transparency of information
- improved handling practices and standards
- compliance with regulation
- enhanced safety
- maximum asset utilisation
- minimum environmental impact
- reduced maintenance costs
- highest performance measurement technologies.

“SF6 is a major greenhouse gas. Measuring, monitoring and capturing SF6 is an important step in ongoing substation maintenance programmes.”





Why measure SF6?

Plant availability and reliability amounts to efficiency and profitability. Therefore insulating gas analysis can be most effective when applied to a number of routine testing and maintenance programmes.

- identify the location of internal flashover faults
- identify the appropriate method for disposal of contaminated gas
- avoid the unnecessary internal inspection of equipment
- profile the long term behaviour of switchgear and instrument transformers
- determine contact and Teflon cone wear
- identify the presence of PD, hot spots, extreme loadings, insufficient contact between parts at the same potential
- verify gas quality/condition after filling (including moisture, air and SF6 content)
- determine the condition of individual items of equipment following abnormal system events
- determine the condition of the gas prior to opening a compartment or applying other test devices to ensure that appropriate gas handling measures/protective measures for staff are followed and instruments are not destroyed by contaminated gas.

*The world's most advanced SF6 Analyser ...
bringing the laboratory to the field*



Zerowaste®

The Zerowaste® is the world's first SF6 impurity gas analyser to combine the following features:

Simultaneous SF6 measurement of up to 11 parameters

- uses advanced infrared absorption technology to measure SF6, H2O, HF, R12 and CF4 in addition to SO2, CO and H2S with electrochemical cell, bringing laboratory-standard measurement to the field
- fully battery operated (minimum 8 hours) even during gas pump back
- automatic sampling of up to 5 sequential measurements
- automatic pump back for sampled gas (user-selectable)
- automatic start of measurement upon detection of gas connection (user-selectable)
- minimum amount of gas drawn of typically 250cc per measurement cycle
- time programmable moisture purge for highest quality H2O measurement
- fully upgradeable - easy addition of more sensors
- innovative and patented modular design that allows the measurement of the largest number of gases offered in the market
- optional SF6 leak detection probe



- full colour touchscreen display with user friendly interface
- data logging
- user-selectable methods to display compliance with different industry standards including IEC/CIGRE.

This has been made possible by utilising some of the best experience and knowledge in gas sensing, spectroscopy and product design and an extensive knowledge of the SF6 impurity market.

Infra Red SF6 Analyser measures SF6 purity, H2O and SO2 in a simple to use field portable analyser with laboratory like results

Zerowaste® 3 Gas Analyser

EMT offers a complete range of analysis and handling instruments designed to meet the varying application requirements of Testing & Maintenance in SF6 gas filled equipment.

Our technologies are used in T&D networks of switchgear and circuit breakers around the world for the analysis and testing of all parameters associated with SF6 gas quality. EMT offers 3 Gas Analysis on 2 of its models: Zerowaste® and Asserolyz-IR™.

The "Zerowaste® 3 Gas Analyser" first analyses the gas and then stores the gas in an internal storage facility.

There is no cross contamination between the gas analysed and the gas stored as the analysis is done prior to storage. Gas emissions are virtually eliminated and when the storage is full, the gas can be pumped either automatically (if selected) or manually, back to the breaker or a waste vessel for gas recycling.

In addition, the instrument provides an accurate measurement of the breaker pressure (0.5 bar to 10 bar 7 to 145 PSI) through a manifold gas entry port which also regulates the internal pressure of the gas inside the analyser.

A leak detection probe can be included as an option together with the export of logged data through a USB. The "Zerowaste® 3 Gas Analyser" provides a cost effective solution for measuring SF6 quality.

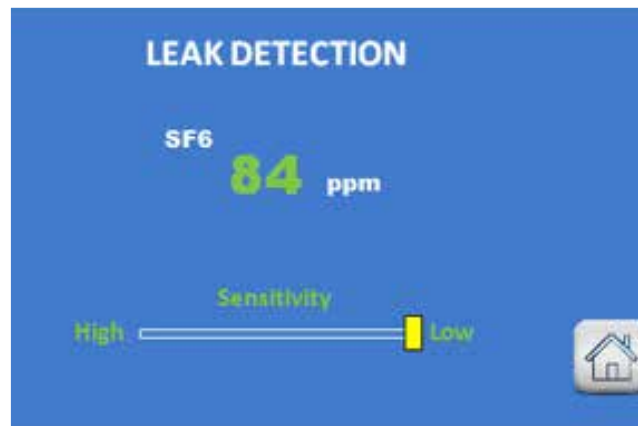
Features of the EMT Zerowaste® IR SF6 Analyser

- Auto Operation: Connect and Walk Away!**
 connect to the circuit breaker and the Zerowaste® automatically samples the SF6 gas, detects when gas is connected (by sensing the inlet gas pressure), starts the preselected number of cycles automatically and then pumps the gas back after analysis
- Safe Distance Working**
 the Zerowaste® allows a safe working distance for the user. Once started, the unit will wait for 2 minutes before automatically commencing the analysis
- Multi Analysis Operation**
 the user can select up to 5 cycles to run on the same sample. In fully automatic mode, the instrument will run the selected number of cycles then pump the gas back at the end. The user will then be able to view and save the results for the number of measurements taken.
- Fully Portable**
 AC or 8 hours battery operated, even during gas recycling
- The Lightest 'Pump Back' SF6 Analyser**
 Zerowaste® including lead crystal battery weighs only 17Kg (37.5lbs) and is housed in a robust IP67 case with wheels, retractable handle and pockets for hoses and spare parts
- The Fastest**
 just 5 minutes per cycle
- The Most Accurate**
 laboratory performance results
- Smallest Amount of SF6 Gas Sample Used**
 just 250cc's of SF6, making the Zerowaste® ideal for low voltage breakers. With enough gas storage for up to 5 normal sampling cycles, the unit enables checks on repeatability and performance
- Up to 11 Gases - User-Selectable**
 multi sensor Hi/Lo ppm technology. SF6 Purity, Dew Point, SO2 (low/high range), HF, CF4 (low/high range), Air, CO, H2S, R12 (push gas)
- Pre Set IEC and CIGRE Methods - Red/Green = Fail/Pass**
 methods fully compliant with all current IEC & CIGRE requirements, plus 3 custom methods available
- Leak Detection Probe Option**
 ppm/gm per year.

Leak Detection Option

The main Leak Detection screen shows the SF6 level (ppm) as well as a sensitivity adjustment bar.

The SF6 units can be selected as either ppm or gm/year.



EMT helped us to get the most out of our assets by working in partnership with us throughout



Technical Specification - Zerowaste®



Gases Measured and Options	Gas	Range	Repeatability
	SF6 Purity	0-100%	+/-0.5% FS ¹
	Dewpoint	-60°C - 20°C	+/-0.5°C at -30°C
	HF	0-200ppm	+/-5% FS ¹
	SO2 Lo	0-150ppm	+/-2% FS ¹
	SO2 Hi	0-500ppm	+/-2% FS ¹
	CF4 Lo	0-4000ppm	+/-2% FS ¹
	CF4 Hi	0-65%	+/-1% FS ¹
	CO	0-1000ppm	+/-5% FS ¹
	H2S	0-100ppm	+/-5% FS ¹
	R12	0-250ppm	3% of FS ¹
	AIR	0-50%	1% of FS ¹

FS¹: Full Scale (of Measuring Range)

SF6 Leak Detection	Detection Limit	3 gm/year
	Technology	NDIR

Screen	Type	TFT
	Size	4.3" 16:9 (wide aspect ratio)
	Resolution	480 x 272 dots
	Transmission Mode	TN/Transmissive/Normally White
	Dot Pitch	0.198 x 0.198
	Colours	24 bit
	Touchscreen	Integrated resistive touch panel
	Backlight	White LED PWM
	Luminance	350Cd/m2 (Typ.)

Gas Pressure	0.5 to 10 bar (7 to 145 PSI)	
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Memory	Type	Flash EEPROM
	Capacity	1000 results

High Pressure Option	Bar = 0.5 to 12 Bar	
	PSI = 7 to 174 PSI	

PC Communications	Type	USB
	Class	HID
	Connector	Mini AB

Battery	Operating Time	>8 hours
	Charger Input	100-240V - 50/60Hz

Operating Environmental Conditions	Temperature Range	-20°C to +50°C (-4°F to +122°F)
	Humidity	0-95%RH non-condensing

Physical Specifications	Weight	17kg (37.5lbs)
	Maximum Dimensions	L500 x W300 x D470 mm (19.11" x 12" x 18.5")

EMT Verify - proving your SF6 analysis. Another world first from EMT - leaders in SF6 Analysis, Handling & Measurement.



How do you know your SF6 results are accurate?

Are you confident in the results from your SF6 analyser?

EMT's Verify range of precision SF6 gas verification products set the industry benchmark in quality and stability for proving your SF6 analysis.

- EMT Verify gas standards meet all NIST* quality criteria
- Gases come complete with NIST traceable certificates of analysis
- Gas verification is achieved in under 5 minutes

Vast experience and technical knowledge of the SF6 testing and measurement market has culminated in EMT being the first SF6 company to launch its own gas standards.

This specialism means that EMT are able to offer the most difficult reactive gas mixtures with the guarantee of quality and stability, for peace of mind, ensuring results confidence.

The Verify range works with all types of SF6 gas analyser including WIKA, DIL0, MBW and Cambridge Sensotec.

*NIST = National Institute of Standards and Technology



Certificate of analysis



Carry Case

The EMT Verify Carrying Case is ideal for safely storing and transporting all EMT Verify Gas Cylinders and Regulators.

Technical Specification - EMT Verify



Regulator



Part Number	Dial-A-Flow
Valve Inlet	C10
Fits Cylinder	58L
Flow Rate	0.3 - 8 LPM (0.07-0.8 gpm) Selectable
Gauge PSIG	1500 PSIG (103 Bar)
Material	Aluminium

Cylinder

Part Number	58L
Pressure	500 PSIG (34.5 Bar)
Gas Type	All reactive mixtures (upon request)
Dimensions	14.25" x 4.25" (36.2 x 10.8 cm)
Volume Capacity Empty	2.2 Litres (0.077 Cu Ft)
Material	Aluminium alloy
Weight	2lbs 5oz (1.051 Kg)
Valve Outlet	5/8" - 18 UNF (C10)
Regulator	VGAS-REG-ADT series
Volume Capacity with Gas	58 Litres (2.05 Cu Ft) at 70°F (21.1°C) and 500 PSIG (34.4 Bar)

Part Number	Verification Gas Starter Kit	Accuracy
VGAS-SK-3	Verify gas starter kit including: 3 x 58 ltr gas bottles (SF6/SO2/H2O) + soft carry case and regulator /Swagelok 1/2" adapter.	
	SF6, 58 litre non refillable gas cylinder, 99.99%.	+/- 1%*
	SO2, 58 litre non refillable gas cylinder, 75 ppm.	+/- 3 ppm*
	H2O, 58 litre non refillable gas cylinder, 200 ppm.	+/- 40 ppm*

Part Number	Verification Refill Gases	Accuracy
VGAS-SF6-99-2	Qty 2, SF6, 58 litre non refillable gas cylinder, 99.99%.	+/- 1%*
VGAS-SO2-75-2	Qty 2, SO2, 58 litre non refillable gas cylinder, 75 ppm.	+/- 3 ppm*
VGAS-H2O-200-2	Qty 2, H2O, 58 litre non refillable gas cylinder, 200 ppm.	+/- 40 ppm*

Part Number	Accessories
VGAS-Reg-Adt	Additional Verify gas regulator fitted with Swagelok male 1/2" quick connect adapter
VGAS-Hose	2 metre hose for use with EMT Zerowaste® Analyser
VGAS-VCC	Verify soft carry case for 3 gas bottles

We use the highest quality cylinder in the industry which meets and exceeds all criteria of customers and appropriate regulatory authorities.

Enhance your SF6 Analysis - “Moisture Perfect Hose Vacuum Drying Function” for the Zerowaste® - the addition of this feature has been shown to improve the repeatability of moisture readings in tests on hoses of 2m and 10m lengths.

Zerowaste® Moisture Perfect Hose Vacuum Drying Function

The largest source of error when performing a dew point measurement is produced by moisture embedded in the hose lining.

During a gas measurement, the moisture in the hose diffuses into the gas stream.

The gas on which the measurement is being performed may need to flow for some time before the moisture level in the gas stream has reached an equilibrium equivalent to the moisture content of the gas stream.

The operator of SF6 measuring equipment requires reliable and repeatable data in a reasonable time frame.

The hose vacuum feature means that the hose can be pre-evacuated so that moisture and other contaminants present, can be removed prior to the start of the measurement cycle.

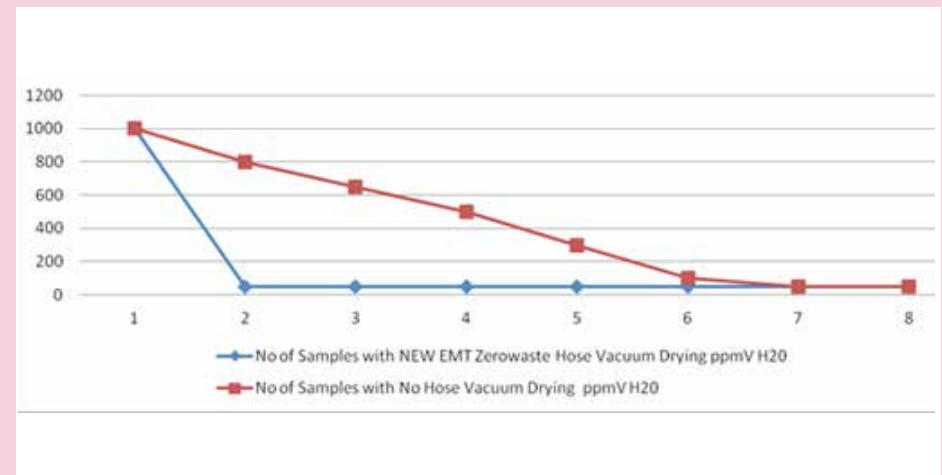
The “Moisture Perfect Hose Vacuum Drying Function” generates a vacuum of approximately 800mbar inside the hose.

This is equivalent to reducing the pressure down to 200mbar (20kPa from 1 bar).

This product is available as an additional feature with new Zerowaste® units or as an upgrade retro-fitted to existing units.

A Firmware upgrade is required to add the “Moisture Perfect Hose Vacuum Drying Function” to menu options. Technical notes are available upon request.

EMT Zerowaste®: Direct Comparison of SF6 Moisture Results from 1000ppmV to 5-ppmV H2O with NEW EMT Moisture Perfect Hose Vacuum Drying Function vs Normal Sampling without Vacuum Drying



Introducing the world's first SF6 Continuous Monitoring System for 24/7/365 monitoring of SF6 installations.

Zerowaste® CMS SF6 Continuous Monitoring System

Ideal for SF6:

- Fault Investigation
- Installation & Commissioning
- Asset Health Trend Analysis
- Condition Monitoring
- Absorbent/Filter Breakthrough
- Recycling/Validation Checks
- Research and Development

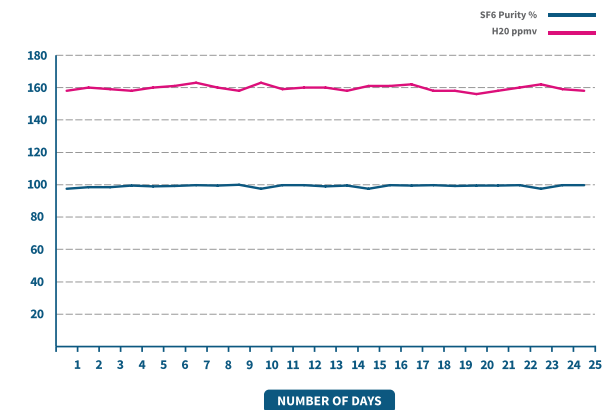
Would you like to know what's happening to the condition of the SF6 gas in your assets, GIS and circuit breakers?

In the event of an unexplained fault with one of your SF6 assets, would you want access to continuous real time data on events leading up to and following a fault or arc breakdown?

What was not possible can now be standard practice with the Zerowaste® CMS – a welcome addition to the most advanced family of SF6 measurement technologies from EMT.



■ CMS demonstration



Data Example of Zerowaste® SF6 Continuous Monitoring System

Benefits of the Zerowaste® CMS:

- Automatic sampling and analysis of SF6 gas, based on user-selectable intervals from 10 minutes to 10 hours between sampling sessions, and with up to 5 samples measured in each session
- Unique drying function – the CMS removes moisture/H2O on pump back
- Automatic SF6 pump back at the end of each set of measurements or when the internal storage is full
- USB data management for integration with Excel and other reporting formats
- On site calibration capability
- Measurement of SF6 quality 24 hours per day, 7 days per week, 365 days per year
- Measurement of 10+ SF6 quality parameters including SF6 purity, H2O - Dewpoint, SO2, HF, CF4, CO, H2S, R12, Air
- Utilises advanced patented Infra Red SF6 measurement technology
- Unique design enables measurement of highly corrosive SF6 breakdown products without damaging the analyser
- 12 hour emergency battery backup in case of power failure
- Fully portable, can be transported and installed on site in minutes.

Technical Specification - Zerowaste[®] CMS



Gases Measured and Options	Gas	Range	Repeatability
	SF6 Purity	0-100%	+/-0.5% FS ¹
	Dewpoint	-60°C - 20°C	+/-0.5°C at -30°C
	HF	0-200ppm	+/-5% FS ¹
	SO2 Lo	0-150ppm	+/-2% FS ¹
	SO2 Hi	0-500ppm	+/-2% FS ¹
	CF4 Lo	0-4000ppm	+/-2% FS ¹
	CF4 Hi	0-65%	+/-1% FS ¹
	CO	0-1000ppm	+/-5% FS ¹
	H2S	0-100ppm	+/-5% FS ¹
	R12	0-250ppm	3% of FS ¹
	AIR	0-50%	1% of FS ¹

FS¹: Full Scale (of Measuring Range)



Zerowaste[®] CMS Sampling Interval Screen - 10 minutes minimum

Operating Environmental Conditions	Temperature Range	-20°C to +50°C (-4°F to +122°F)
	Humidity	0-95% RH non-condensing
Physical Specifications	Weight	17kg (37.5lbs)
	Maximum Dimensions	L500 x W300 x D470 mm (19.11" x 12" x 18.5")
Gas Pressure	0.5 to 10 bar (7 to 145 PSI)	
Measurement Intervals	from 10-600 minutes	
Measurement Cycles	1-5	
Battery	Operating Time	>8 hours
	Charger Input	100-240V - 50/60Hz



Zerowaste[®] CMS Sampling Interval Screen - 600 minutes maximum

The lightest and ultimate in portability ...

Asserolyz-IR™ SF6 Analyser

The most advanced multi-parameter, infra red SF6 gas analyser delivering high performance SF6 measurements remotely, bringing interference-free laboratory performance to the field.

The Asserolyz-IR™ is the world's first SF6 impurity gas analyser to combine the following:

Features

- Innovative modular design that allows the measurement of the largest number of gases offered in the market
- up to 11 parameters measured simultaneously within 5 minutes!
- uses advanced infrared absorption technology to measure SF6, H2O, HF, R12 and CF4 in addition to SO2, CO and H2S with electrochemical cell, bringing laboratory-standard measurement to the field
- fully upgradeable to Zerowaste® plus additional sensors
- **The Lightest**
at just 1.8kg (<4lbs) there is no lighter instrument on the market, and with an optional shoulder harness and rechargeable battery providing up to 8 hours operating time, portability has never been easier
- **The Fastest**
fastest measurement cycle with readings obtained at just 5 minutes per test with only 90 seconds of gas sample
- **The Simplest to Use**
1 button operation, full colour touchscreen with user friendly interface, including 3 user-selectable methods (CIGRE/IEC/ASTM) and 3 custom methods – all via USB communication with datalogging for up to 1000 results
- **The Most Accurate**
accurate IR is specific with no cross interference,

no contamination and no drift. Delivering stable, repeatable readings the Asserolyz-IR™ outperforms any SF6 gas analyser

- **With Less SF6 Waste**
minimal gas usage during operation - less than 1 litre (250cc)
- **Leak Seeker Option**
offering an optional SF6 leak detection module (audible) probe type, with an operating temperature range of -20°C to +50°C, (-4°F to +122°F) gas flow of 300ml/min, and input gas pressure of up to 10 Bar, this analyser is unrivalled in every way
- **Giving the Best Overall Performance**
the Asserolyz-IR™ provides the most comprehensive analysis of any analyser available in the industry.

Benefits

- **effective controls on SF6 inventory and usage**
- **accurate monitoring and transparency of information**
- **improved handling practices and standards**
- **compliance with regulation**
- **enhanced safety**
- **maximum asset utilisation**
- **minimum environmental impact**
- **reduced maintenance costs**



Infra Red SF6 Analyser measures SF6 purity, H2O and SO2 in a simple to use field portable analyser with laboratory like results

Asserolyz-IR™ 3 Gas Analyser

EMT offers a complete range of analysis and handling instruments designed to meet the varying application requirements of Testing & Maintenance in SF6 gas filled equipment.

Our technologies are used in T&D networks of switchgear and circuit breakers around the world for the analysis and testing of all parameters associated with SF6 gas quality. EMT offers 3 Gas Analysis on 2 of its models: Asserolyz-IR™ and Zerowaste®.

The "Asserolyz-IR™ 3 Gas Analyser" delivers highly accurate infra red analysis previously only available in laboratory based instruments, to power industry on-site plant applications.

Light with easy to use operation combined with accurate, fast measurement together with very low gas usage and high data storage capacity, this "Asserolyz-IR™ 3 Gas Analyser" provides a cost effective solution for measuring SF6 quality.

Technical Specification - Asserolyz-IR™



Gases Measured and Options	Gas	Range	Repeatability
	SF6 Purity	0-100%	+/-0.5% FS ¹
	Dewpoint	-60°C - 20°C	+/-0.5°C at -30°C
	HF	0-200ppm	+/-5% FS ¹
	S02 Lo	0-150ppm	+/-2% FS ¹
	S02 Hi	0-500ppm	+/-2% FS ¹
	CF4 Lo	0-4000ppm	+/-2% FS ¹
	CF4 Hi	0-65%	+/-1% FS ¹
	CO	0-1000ppm	+/-5% FS ¹
	H2S	0-100ppm	+/-5% FS ¹
	R12	0-250ppm	3% of FS ¹
	AIR	0-50%	1% of FS ¹

FS¹: Full Scale (of Measuring Range)

SF6 Leak Detection	Detection Limit	3 gm/year/PPM
	Technology	NDIR

Screen	Type	TFT
	Size	4.3" 16:9 (wide aspect ratio)
	Resolution	480 x 272 dots
	Transmission Mode	TN/Transmissive/Normally White
	Dot Pitch	0.198 x 0.198
	Colours	24 bit
	Touchscreen	Integrated resistive touch panel
	Backlight	White LED PWM
Luminance	350Cd/m2 (Typ.)	

Memory	Type	Flash EEPROM
	Capacity	1000 results

Battery	Operating Time	>6 hours
	Charger Voltage	12V
	Charger Connector	2.5mm jack plug
	Charger Input	100-240V - 50/60Hz

PC Communications	Type	USB
	Connector	Mini AB

Gas Pressure	0.5 to 10 Bar (7 to 145 PSI)
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Operating Environmental Conditions	Temperature Range	-20°C to +50°C (-4°F to +122°F)
	Humidity	0-95% RH non-condensing

Physical Specifications	Weight	1.8kg (4lbs)
	Maximum Dimensions	565 x 205 x 86 mm (22.25" x 8.0" x 3.25") (instrument only)
	Maximum Case Dimensions	L645 x D450 x W195 mm (25.0" x 17.0" x 7.0")

EMT Verify - proving your SF6 analysis. Another world first from EMT - leaders in SF6 Analysis, Handling & Measurement.



How do you know your SF6 results are accurate?

Are you confident in the results from your SF6 analyser?

EMT's Verify range of precision SF6 gas verification products set the industry benchmark in quality and stability for proving your SF6 analysis.

- EMT Verify gas standards meet all NIST* quality criteria
- Gases come complete with NIST traceable certificates of analysis
- Gas verification is achieved in under 5 minutes

Vast experience and technical knowledge of the SF6 testing and measurement market has culminated in EMT being the first SF6 company to launch its own gas standards.

This specialism means that EMT are able to offer the most difficult reactive gas mixtures with the guarantee of quality and stability, for peace of mind, ensuring results confidence.

The Verify range works with all types of SF6 gas analyser including WIKA, DIL0, MBW and Cambridge Sensotec.

*NIST = National Institute of Standards and Technology



Certificate of analysis



Carry Case

The EMT Verify Carrying Case is ideal for safely storing and transporting all EMT Verify Gas Cylinders and Regulators.

Technical Specification - EMT Verify



Regulator



Part Number	Dial-A-Flow
Valve Inlet	C10
Fits Cylinder	58L
Flow Rate	0.3 - 8 LPM (0.07-0.8 gpm) Selectable
Gauge PSIG	1500 PSIG (103 Bar)
Material	Aluminium

Cylinder

Part Number	58L
Pressure	500 PSIG (34.5 Bar)
Gas Type	All reactive mixtures (upon request)
Dimensions	14.25" x 4.25" (36.2 x 10.8 cm)
Volume Capacity Empty	2.2 Litres (0.077 Cu Ft)
Material	Aluminium alloy
Weight	2lbs 5oz (1.051 Kg)
Valve Outlet	5/8" - 18 UNF (C10)
Regulator	VGAS-REG-ADT series
Volume Capacity with Gas	58 Litres (2.05 Cu Ft) at 70°F (21.1°C) and 500 PSIG (34.4 Bar)

Part Number	Verification Gas Starter Kit	Accuracy
VGAS-SK-3	Verify gas starter kit including: 3 x 58 ltr gas bottles (SF6/SO2/H2O) + soft carry case and regulator /Swagelok 1/2" adapter.	
	SF6, 58 litre non refillable gas cylinder, 99.99%.	+/- 1%*
	SO2, 58 litre non refillable gas cylinder, 75 ppm.	+/- 3 ppm*
	H2O, 58 litre non refillable gas cylinder, 200 ppm.	+/- 40 ppm*

Part Number	Verification Refill Gases	Accuracy
VGAS-SF6-99-2	Qty 2, SF6, 58 litre non refillable gas cylinder, 99.99%.	+/- 1%*
VGAS-SO2-75-2	Qty 2, SO2, 58 litre non refillable gas cylinder, 75 ppm.	+/- 3 ppm*
VGAS-H2O-200-2	Qty 2, H2O, 58 litre non refillable gas cylinder, 200 ppm.	+/- 40 ppm*

Part Number	Accessories
VGAS-Reg-Adt	Additional Verify gas regulator fitted with Swagelok male 1/2" quick connect adapter
VGAS-Hose	2 metre hose for use with EMT Zerowaste® Analyser
VGAS-VCC	Verify soft carry case for 3 gas bottles

We use the highest quality cylinder in the industry which meets and exceeds all criteria of customers and appropriate regulatory authorities.

A low cost solution for compliance with environmental SF6 regulations, the EMT APM works with existing SF6 analysers at a fraction of the cost of buying new equipment.

APM Auto SF6 Pump Back Module – Zero SF6 Emissions

Are you considering changing your existing SF6 analyser to comply with new regulations on zero SF6 emissions?

Do you have a fleet of SF6 analysers (DILO, WIKA, COSA, GE units or others) which do not pump back measured SF6 after analysis?

Do you have problems sourcing SF6 capture and disposal vessels?

The APM Auto SF6 Pump Back Module is portable, self contained, efficient and simple to use, and allows you to keep your existing fleet of SF6 analysers as an asset WITHOUT the large capital cost associated with buying a new fleet of compliant pump back SF6 analysers.

Advantages of the APM Auto SF6 Pump Back Module:

- Designed for use with the Asserolyz-IR™ SF6 gas analyser and any other non pump back SF6 gas analysers
- Collects and stores measured SF6 gas after analysis
- Stored SF6 gas can be pumped back to any SF6 compartment or sample/waste vessel
- Optional Hose Vacuum Drying Function
- Fully portable operation that works with or without AC supply for up to 50 pump backs
- Housed in a robust IP67 rated Peli case complete with lid organiser for accessories



Technical Specification - APM



Case Type	Peli Case Storm im2435	
IP Rating	IP67	
Physical Specifications	Weight	12kg (26.45lbs)
	Maximum Dimensions	L473 x W235 x D419 mm (18.63" x 9.25" x 16.5")
Battery	Operating Time	>8 hours
	Charger Input	100-240V - 50/60Hz
Accessories	Battery charger	
	Inlet regulator	
	Detachable black carrying strap	



The smartest ...

Smartfill SF6 Filling & Topping Up System



With constantly changing regulations governing SF6 inventory and usage, measurement and control is essential. This smart solution significantly improves upon SF6 gas handling practices used throughout the industry worldwide.

Features

■ Accurate Measurement

precise measurement and control of SF6 gas used in the filling and topping up operations of electricity substation maintenance, utilises a traffic light system for indication during fill/top-up

■ Complete Traceability

automatic datalogging with USB connectivity, records show exactly how much SF6 gas has been used during these procedures. When finished, it shows the end pressure and total SF6 gas utilised

■ Portable and Fully Automated

WiFi connectivity for remote operation and GPRS/MiFi (mobile WiFi). Battery operated for at least 5 hours. With set parameters and simple operation - press "Go" and Smartfill carries out its filling and topping up protocols with complete automation and precision

■ No Waste - No Leakage

fills and tops up equipment with the exact amount of SF6 gas required.



Benefits

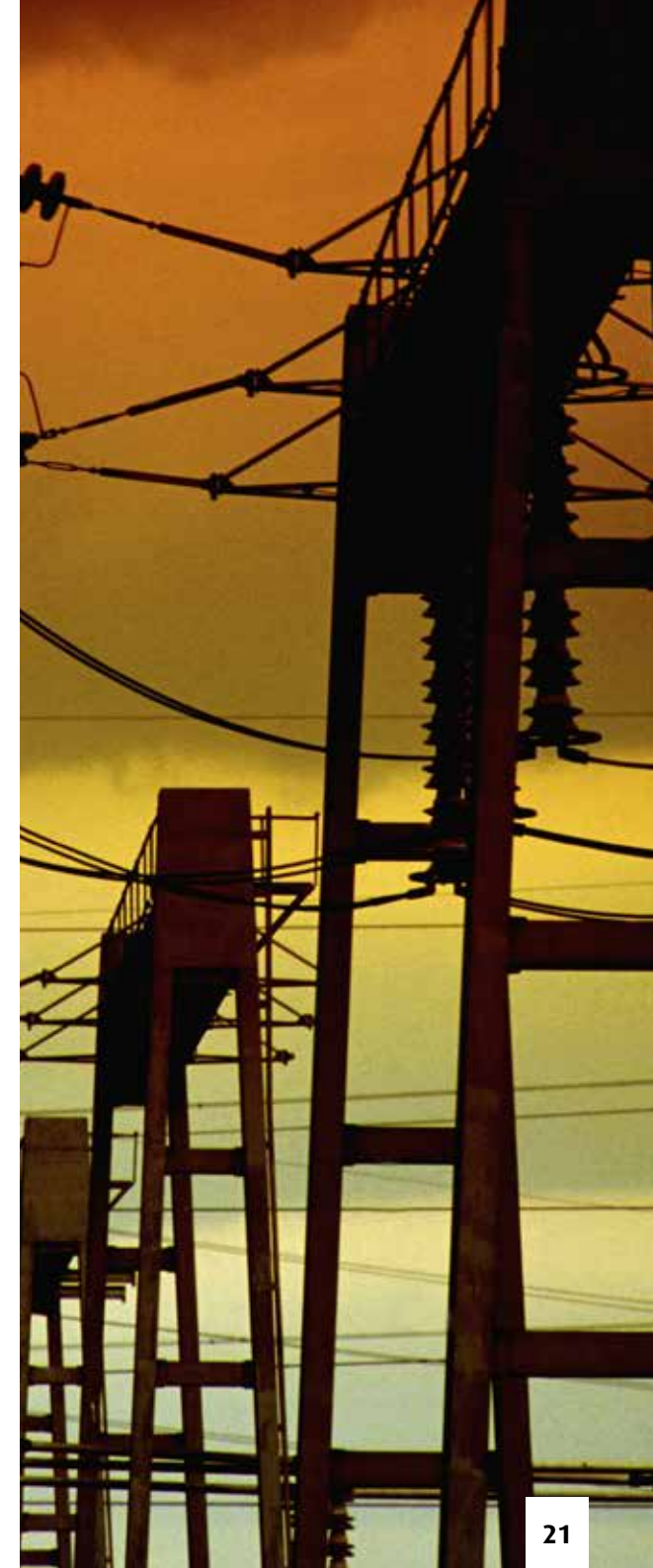
- effective controls on SF6 inventory and usage
- accurate monitoring and transparency of information
- improved handling practices and standards
- compliance with regulation
- enhanced safety
- maximum asset utilisation
- minimum environmental impact
- reduced maintenance costs.

Smartfill Layout and Connections



Layout and Connections

- 1** inlet SF6 gas, Swagelok 1/2" female quick coupling, max pressure 10 Barg
- 2** battery / VDC power adaptor
- 3** fuse, max T6.3A
- 4** emergency button, will disconnect the power to the positive shut-off valve, no SF6 gas flow possible. An alarm in the software will occur
- 5** 2 tone buzzer, for top-up finished and alarm. Sound level SPL: 92dB
- 6** HMI, touchscreen - highly visible, even in direct sunlight
- 7** on-off switch
- 8** port A, 6 pins connector for Traffic Light or other auxillary option
- 9** USB connector, for saving report files
- 10** outlet SF6 gas, Swagelok 1/2" female quick coupling, max pressure 10 Barg.



Technical Specification - Smartfill



Operation	Max flow rate 18 Kg/h - 70 Kg/h 39.6 lbs/hr - 154.3lbs/hr
	Smallest deviation 0.5 Barg (7 PSI) Example: Fill Pmin 3.0 Barg (43.5 PSI) Top-up to Pmax 3.5 Barg (50.7 PSI)
	Maximum pressure 10 Barg (145 PSI)
Accuracy	Flow 1% of FS
	Pressure sensors 0.5% FS
	Max inlet pressure 10 Barg (145 PSI)
	Min inlet pressure 2 Barg (29 PSI)
Safety	Emergency button will close inlet valve and trigger HMI, an alarm email is sent (only in case internet connection is unavailable)
	Relief valve, opens at 11 Barg (159.5 PSI)
	Positive shutoff closes when communication fails for 60 seconds
	Indication when filling, traffic light flashes orange
	Sends email or text/SMS when AC power fails (option)
Operating Temperature Range	-20°C to +40°C (-4°F to +104°F)

Remote Control	VCN viewer available for: iOS, Android, WP8 Blackberry, PC and Mac	
Hoses	Braided hoses – Swagelok/PTFE - Pressure tested to 100 Barg (1,450 PSI)	
Certification	Braided hoses – Swagelok/PTFE - Pressure tested to 100 Barg (1,450 PSI)	
	Pressure test certificate (10 Barg or 145 PSI)	
Power Supply	AC power 110/230VAC – 50/60Hz	
	Enclosure IP rating – 68	
	Portable – 2 hours	
USB Drive	8 GB maximum, USB 2.0 compliant, 2 GB recommended	
Physical Specifications	Weight	17.8kg (39.2lbs)
	Maximum Dimensions	L500 x W300 x D470 mm (19.11" x 12" x 18.5")

“The on-going service & support that we’ve received from EMT’s Customer Support Team has been second to none”

Do you need to measure SF6 inventory and usage compliantly and with complete traceability?



Smartfill SmartWeigh®

Would you like the additional assurance of an integrated weigh scale facility as well as the traceability of mass flow control in one simple SF6 handling device?

Do you demand accuracy and precision in the filling and topping up of SF6 compartments and breakers?

Are safety and reliability paramount to your SF6 filling and topping up operations?

The Smartfill SmartWeigh® delivers all this and more ...



SmartWeigh® Start Screen with Icon



Starting Weight



Start and Finish Weight



Technical Specification - SmartWeigh®



The SmartWeigh® meets the CARB USA requirements for SF6 inventory measurement procedures

Operation/Application	Gas cylinder weighing	
	Scales can be used to compare total SF6 gas used during a filling operation with the Totalizer value displayed by the Smartfill	
Weighing Range	0-300lbs	
	0-136Kg	
Accuracy	SmartWeigh® Weigh Scale ≤ 0.1 (% of Span)	
	Smartfill Mass Flow Controller (MFC)	
	Flow 1% of FS	
	Pressure sensors 0.5% FS	
	Max inlet pressure: 10 Barg (145 PSI) Min inlet pressure: 2 Barg (29 PSI)	
Protection - Enclosure Rating	Peli Case NEMA 4 (IP65)	
Display	Weight is shown on Smartfill display when connected	
Power Supply	AC power 110/230VAC - 50/60Hz and battery	
Operating Temperature Range	-20°C to +40°C (-4°F to +104°F)	
Case Construction	Peli case with integrated SmartWeigh® scales compartment	
Dimensions	L500 x W350 x D470 mm (19.11" x 14" x 18.5")	
Physical Specifications	Weight	23.8kg (52.2lbs)
	Maximum Dimensions	L500 x W300 x D470 mm (19.11" x 12" x 18.5")



The 24/7 leak manager ...

Smartfill - Continuous SF6 Top-Up Manager

A unique SF6 “live topping up” device, designed for managing leakage of SF6 from circuit breakers and other plant, minimises SF6 released in exceptional circumstances, where the asset has to remain in service and operational.

Features

- **Auto Top-Up**
to achieve “live topping up” the unit is continually attached to the gas zone in order to manage the gas pressure within a small pressure range i.e. 3.3 - 3.4 Bar. “Auto top-up” will occur when pre set alarm pressure levels drop below the lower limit
- **Automated Pressure**
maintained between defined upper and lower limits preferably just above alarm level
- **Remote Start Up**
operator able to start the top-up remotely via WiFi (option)
- **Data Logging**
text message sent to operator upon completion. Data including operator, site, equipment, mass and time is sent to ftp web server automatically (option)
- **Automated Shut Down**
unit shuts off when target pressure is reached
- **Fail Safe**
pipe work has a check valve at the zone end, pressure comparison either side and shut down. There is also a safety relief valve within the unit
- **Portable**
easily transported, weighing 20kg (44lbs).



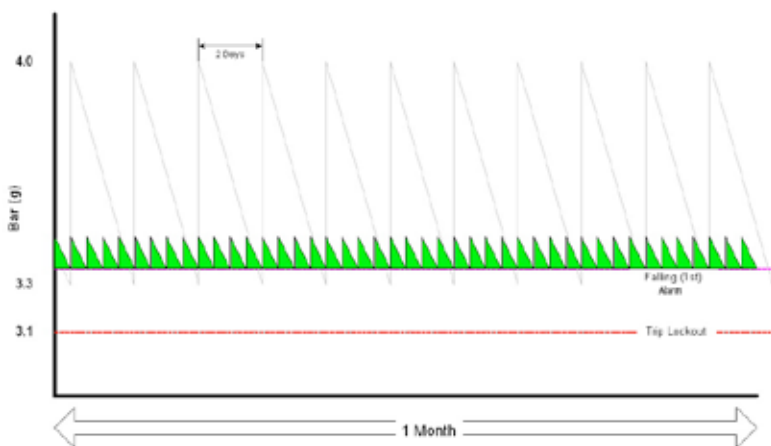
Benefits

- **effective controls on SF6 inventory and usage**
- **accurate monitoring and transparency of information**
- **improved handling practices and standards**
- **compliance with regulation**
- **enhanced safety**
- **maximum asset utilisation**
- **minimum environmental impact**
- **reduced maintenance costs**
- **24/7 topping up.**

Concept

The Smartfill Continuous Top-Up Manager is designed for minimising unwanted release of SF6 into the environment.

In the event of **exceptional** circumstances where the asset, i.e. switchgear, has to remain in service without repair, the unit can be continually attached to a gas zone and maintain the pressure between a comparatively small range, e.g. 3.2 - 3.3 Bar. Using the Continuous Top-Up Manager results in a noticeable reduction in SF6 usage, therefore saving SF6 costs and inventory.



Principle of saving SF6 gas using the Smartfill

The top-up operation will be similar to the Smartfill Massflow unit, except there is a smaller pressure deviation and continuous capability i.e. the Smartfill will automatically start each time pressure runs under the lower limit.

Traffic Light

The Smartfill is supplied with a traffic light system. Using this traffic light gives information on the Smartfill's status without the need of opening the lid or using remote control.



Signal	Status
Green	Fill process standby; or no fill process started
Orange	The fill process is in startup phase or the CTU is filling
Red	Alarm, the system needs attention. All processes stopped
Flashing Red Light	The system is down, this can be caused by pushing the emergency button.

Hose Connections CTU

Only hoses supplied with the CTU should be used with the unit. These are unique with sensors installed which are calibrated in combination with that specific Smartfill CTU, and are therefore not interchangeable!

The supplied pair of hoses consists of two types, one for the inlet and one for the outlet. The outlet hose is fitted with a non-return valve and a pressure sensor.

Modifying the hoses, or extending them, could result in malfunctioning. If other hoses are required please contact EMT.



Outlet hose with sensor and non-return valve

Description

- 1 Swagelok self-sealing 1/2" coupling
- 2 Non-return valve
- 3 Pressure transducer

Technical Specification - Continuous Top-Up Manager (CTU)

Operation	Max flow rate 18 Kg/h - 70 Kg/h 39.6 lbs/hr - 154.3 lbs/hr
	Smallest deviation 0.5 Barg (7 PSI) Example: Fill Pmin 3.0 Barg (43.5 PSI) Top-up to Pmax 3.5 Barg (50.7 PSI)
	Maximum pressure 10 Barg (145 PSI)
Accuracy	MFC 1% of FS
	Pressure sensors 0.5% FS
	Max inlet pressure 10 Barg (145 PSI)
	Min inlet pressure 2 Barg (29 PSI)
Safety	Emergency button will close inlet valve and trigger HMI, an alarm email is sent
	Relief valve, opens at 11 Barg (159.5 PSI)
	Positive shutoff closes when communication fails for 60 seconds
	Indication when filling, traffic light flashes orange
	Sends email when AC power fails (option)
	Outlet hose pressure is monitored at beginning and end
Remote Control	VCN viewer available for: iOS, Android, WP8 Blackberry, PC and Mac Range WiFi: Max 50 Metres

WiFi	Built in WiFi. This is used for remote control	
	The built in WiFi supports IEEE 802.11n, IEEE 802.11g and IEEE 80-2.11b	
Hoses	Braided ½" hoses from Swagelok	
Certification	NMI Traceable Digital Massflow Controller	
	Pressure sensors are calibrated and synchronised using an NMI traceable pressure meter	
	Pressure test certificate (10 Barg or 145 PSI)	
	No Ex required	
Power Supply	AC power 110/230VAC - 50/60Hz	
	Enclosure IP rating – 68	
	Portable – 2 hours	
USB Drive	8 GB maximum, USB 2.0 compliant, 2 GB recommended	
Log File Size	The maximum size per log file is +/- 100kb	
Operating Temperature Range	-20°C to +40°C (-4°F to +104°F)	
Physical Specifications	Weight	35kg (77lbs)
	Maximum Dimensions	L630 x W460 x D170 mm (24.8" x 18.1" x 6.7")

Options and Accessories

EMT can provide connection to any SF6 compartment

EMT Universal Fittings Kit (EMT Part Number : SF6FIT)

Complete kit containing fittings required for the connection of SF6 gas analysers to most commercially available SF6 switchgear and circuit breakers, housed in a robust portable case.

- Swagelok Female Hanson Female
- Swagelok Male DN6
- Swagelok Male Hanson Female
- Swagelok Male DN8
- Swagelok Male DN20
- DN7 Female
- Swagelok Male 3/8 BSP Female
- Swagelok Male 3/4 BSP Male
- Swagelok Male Hanson Male
- Swagelok Male 1/4 NPT Male.



We can supply fittings for the following manufacturers:

- | | |
|----------------------------------|--------------|
| ■ ABB | ■ Hanson |
| ■ Siemens | ■ Staubli |
| ■ Schneider | ■ Malmqvist. |
| ■ Hyundai | |
| ■ Hyosung including all DN range | |

Low Pressure Operating Option (0.1 Bar) (EMT Part Number : Low P Option)

EMT offers a low pressure operating option that will allow gas samples with pressures as low as 0.1 bar to be measured by the Zerowaste®. An additional internal pump is fitted that helps draw the sample gas into the sensor compartment. The Low pressure option can be retro-fitted to existing units.

12 Bar High Pressure Option (12 Bar) (EMT Part number : IR 12 Bar Option)

EMT offers a high pressure option that will allow gas samples with high pressures to flow at a maximum of 12 Bar.

The Gas Sampling inlet manifold is replaced with a high pressure manifold capable of handling a higher gas pressure. The pressure is monitored by a pressure transducer that has a range up to 12 bar. The internal pump that pumps back the gas is also replaced for a compressor pump that is capable of pumping the gas back to compartments with pressures as high as 12 Bar.

IR Sample Hose (EMT Part Number : IR Hose)

EMT Zerowaste® and Asserolyz-IR™ use a 2m sample hose. The sample hose has an inner PTFE tube with an internal diameter of 2mm through which the gas flows.

The hose is protected with a braided steel outer sheath.

The hose is terminated in a DN7 male fitting (for connection to the Zerowaste® Gas Sampling port and a 1/2" Quick Connect Female Swagelok fitting for connection to the gas insulated switchgear (via an EMT adaptor fitting).

- Additional hose lengths are available upon request up to 10 Metres (30 Feet).



Funnel for Filter Refill (EMT Part Number : IR FNL)

Tool used to fill the external filter tube with filter material – used with Asserolyz-IR™ and Zerowaste®.



Filter Packs 10 off (EMT Part Number : IR Filter)



Shoulder Harness (EMT Part Number : IR Harn)

The shoulder harness allows the user to carry the Asserolyz-IR™ around with maximum comfort leaving hands free to do other tasks.



Leak Detection Probe

(EMT Part Number : IR Leak)

The flexible probe is provided with all units ordered with leak detection option. It plugs into the Purge Filter Port of the instrument through a coiled tube that is extendable to 1 metre.



Carry Case (EMT Part Number : IR Case)

The carry case protects the Asserolyz-IR™ during transportation and travel and has moulded sections to accommodate the Asserolyz-IR™ as well as all accessories.

A large pocket, fitted to the lid, is also provided to accommodate tubing and other components for use with the instrument.



Spare Parts

Zerowaste® Charger (EMT Part Number : EMTCHRG-01)

A universal battery charger is provided with UK, US and European interchangeable mains/power plugs.

The charger also accepts a standard “figure of 8 mains cable” as shown below (not provided) if preferred.

The Zerowaste® can be used in AC mode with the battery charger connected or in DC mode powered from the lead acid battery. The battery charger is used to re-charge the internal lead acid battery.

The pumping back of analysed gas to the circuit breaker or to a waste vessel is done by an internal compressor pump connected to the battery.

The battery must be charged to a certain level to allow the pump back operation. Therefore, where possible the unit should be used with the battery charger connected to AC mains power so that the battery is continuously charged.

(Note: The Zerowaste® battery charger should not be used to charge the Asserolyz-IR™ lithium ion battery pack).



Asserolyz-IR™ Battery Charger (EMT Part Number : EMTCHRG-02)

The Asserolyz-IR™ uses an internal Lithium Ion battery pack. A universal battery charger is provided with UK, US and European interchangeable mains plugs.

(Note: The Asserolyz-IR™ battery charger should not be used to charge the lead acid battery in the Zerowaste® SF6 analyser).



EMT assero Oil Analysis & Handling

At EMT, we can help you get the most from your valuable asset by discussing your issues and providing appropriate cost effective solutions to meet your needs. Whether your requirement is portable or engineered, we have a wealth of experience and knowledge gained through partnerships with industry professionals. We are confident that we can help you achieve your asset management objectives.

Our assero range of Oil and SF6 testing products are world leading technologies, developed with industry professionals from around the world with many years of experience in this field, so that our clients can make a more informed choice.

Our team of experienced professionals have spent many years developing answers to the problems faced within this industry and we are confident that we will have a solution that suits your needs.

Analysis plays a vital role in determining the condition of transformers and other assets. Monitoring the condition of the oil can help prevent sudden faults whilst protecting and preserving the general condition of the plant, and should therefore be part of any predictive maintenance programme.

EMT's portfolio for oil analysis and handling ensures the best possible conditions for the avoidance of transformer deterioration. Products included in this range are the H2OP Portable Moisture in Oil Meter and TAN (Total Acid Number) Titrator.



“EMT came highly recommended by one of our business partners also in ESI. Their people were both professional and knowledgeable.”



assero H20P - The very best for moisture in oil.

assero H20P Portable Moisture in Oil Meter

Delivering the very best analysis results, the H20P has been developed in response to customer feedback both in laboratories and in the field, offering a highly accurate moisture meter for the measurement of H2O in insulating oils down to 1ppm / 100%.

Portable, robust and easy to use, the microprocessor controlled H20P offers versatility for both lab and field applications.

Simple to Use

- One button operation for analysis, fully automated
- 10 user programmable methods
- Results in ppm, mg/kg, % & µg water

Performance & Results

- Unique hermetically sealed glassware, low drift cell design eliminates any outside atmospheric moisture entering the cell, for heightened sensitivity and performance
- 'Quick Connect' system hermetically seals the glassware without the need for costly grease or Teflon sleeves for trouble free assembly and maintenance
- Automatically compensates for errors (patented technique)
- Built-in software package with multi language display and printer
- Conforms to ASTM D1533, D4928, D6304, IP386, IP438, API MPMS Chapter 10.9, IEC60814, ISO 10101-3, 10337 & 12937

Spares & Accessories

Supplied ready for operation complete with comprehensive glassware pack including electrodes, glass titration vessel, leads, syringe, printer paper, calibration certificate and 5 year warranty.

Reagents

Specially formulated to provide optimum performance with all makes and models of coulometric Karl Fischer titrators, our unique reagents provide improved sample miscibility and solubility. The reagent pack comprises 8 single shot screw top bottles containing 100ml anode charges and 8 easy snap ampoules of 5ml cathode charges.

assero H20P Coulometric KF Moisture in Oil Meter · Simple operation · 10 user programmable methods · 1ppm / 100% · Results in ppm, mg/kg, % & µg water → Multi language display & print out → Small footprint → Integral high speed printer → Fully portable → Low drift cell design → Automatically compensated errors (patented technique) · Optional carry case → Conforms to ASTM D1533, D 4928, D6304, IP386, IP438, API MPMS Chapter 10.9, IEC60814, ISO 10101-3, 10337 & 12937.



Date	Results	Result Format	Calculation Mode
06/06/2008	4	ppm	%DD

Sample	Mean	Std	Max	Min	SD	CV
1	27.94	0.39	28.33	27.55	0.3756	1.34
2	27.93	0.39	28.32	27.54	0.3756	1.34
3	27.94	0.39	28.33	27.55	0.3756	1.34
4	27.94	0.39	28.33	27.55	0.3756	1.34

Mean: 27.4 ppm Min: 25.5 ppm Max: 29.4 ppm SD: 0.65 CV: 2.47



Technical Specification - assero H20P

Titration Method	Coulometric Karl Fischer titration
Electrolysis Control	Automatic Compensated Errors control system
End Point Detection	AC polarisation
End Point Indication	Visual display/print out/acoustic beep
Display	40 character alphanumeric backlit LCD
Measuring Range (possible)	1µg – 100mg water
Measuring Range (typical)	1µg – 10mg water
Moisture Range	1 ppm – 100% water
Max. Sensitivity	0.1 µg
Max. Titration Speed	2.0 mg per minute
Max. Current	400 ma
Drift Compensation	Automatically controlled
Start Delay Time	0 – 30 minutes, user selectable
End Delay Time	0 – 30 minutes, user selectable
Power Supply	90-264V AC, 47-63 Hz. 12V DC car adapter/internal battery

Precision	10-100µg ±3µg, 100µg-1mg ±5µg, above 1mg ±0.5%
Calculation Modes	Weight/weight, user programmable
	Weight/dilution ratio, user programmable
	Volume/density, user programmable
	Volume/volume, user programmable
Display Format	µg, mg/kg, ppm, %
Print Format	µg, mg/kg, ppm, %
Statistics	max, mean, min values upto 99 runs
Method Storage	10 user programmable methods
USB Output	USB Flash Drive
Sample ID Number	User programmable
Printer	42 character high speed thermal printer
Stirrer Speed	Microprocessor controlled
Dimensions & Weight	250 x 245 x 120 mm, 3kg
Calendar/Clock	Analysis time & date print out
Battery Low Indicator	Display & print out indication

assero TAN Acidity in Oil Meter

The assero TAN Total Acid Number titrator exclusively available from Energy Maintenance technologies (EMT) Ltd has been designed to offer maximum specifications and features whilst being priced at a very competitive level.

This titrator conforms to ASTM D664 for determination of acidic constituents in petroleum products, lubricants and transformer insulating oils.

Features:

- Simple to use for new users to TAN
- Fast and precise results (5 min max)
- Built in pre-programmed TAN method
- Measurement down to 0.001mg/g KOH acidity
- Results in mg KOH/g
- Compact and light - weighs less than 5 kg
- Data Logger for the last 50 titration results
- Transmission of results to printer or PC
- High precision 10ml syringe
- Resolution 1/40,000 of syringe vol (0.25ul).

Quality Control

ASSERO TAN SN:92901 V2.0
Monday, 02 November 2009 15:13
ANALIZE TAN > 0.1

Sample ID: 000001

Sample (g)	Volume ml	Result mg KOH/g	Time mm:ss
20.0000	0.990	0.24	04:38

Stirring 30%

Operator: Operator 1



Technical Specification - assero TAN

Non-Volatile Memory	3 titration programs depending on TAN content, Blank titration, Clock/calendar
	Name of up to 4 operators
	Up to 50 results stored in Data Logger
Languages	English, Spanish, French, Italian
Display	Graphic backlit LCD, 128 x 64 dots
Keypad	Membrane, 7 keys, guaranteed up to 6 million strokes per key
	Material: PET with protective treatment
Syringe Volume	Standard syringe 10 ml
Resolution	1/40000 of syringe volume (0.25ul)
Dispensing Accuracy	≤ 0.2 % for volumes higher than 10 % of syringe
Dispensing Reproducibility	± 0.1 % for volumes higher than 10 % of the syringe

Liquid Contact Materials	Syringe: borosilicate glass and PTFE
	Electrovalve: PTFE and KEL-F. Tubes: PTFE
Inputs and Outputs	Differential measurement: 2 BNC connectors
	For external keyboard, miniDIN connector
	RS232C bidirectional for PC or printer, telephone connector
	Stirrer control: On/Off and speed, RCA connector
Power Supply	110 – 240 V AC, 50-60 Hz
Electrical Safety	Meets EC, EN 61010
EMC	Meets EC, EN 50081-2 and EN 50082-2
Permitted Temperatures	Operating: 10 – 40 °C. Storage: 10 – 50 °C ≤ 80 %, relative humidity, non condensing
Enclosure	ABS and enamelled steel
Physical Parameters	Weight: 4 kg approx. Dimensions: 130 x 160 x 300mm

Partners

Collaboration with select Business Partners complement EMT's portfolio of world leading technologies. We are the only provider of instrumentation, consumables and related services able to offer a complete range of Oil and SF6 testing products and services, to ensure you find the right product for your application.

What we offer:

Transformer Oil Purification and Reprocessing Equipment:

- Insulating Oil Reprocessing
- Filtering and Regeneration Equipment

SF6 Gas Servicing Equipment:

- Reprocessing
- Filtering and Refilling Equipment

Test and Diagnostic Tools:

- Cable Testing & Diagnostics
- Coil & Winding Insulation Diagnostics
- Transformer Diagnostics

Thermal Imaging Systems

HV Testing Equipment

Ultrasonic Leak Detection

SF6 Training:

Our staff are certified in accordance with EC 305/2008. Minimum requirements for personnel handling and recovering SF6 from high voltage switchgear.

Seminar and Training programmes:

Delivered to improve knowledge of the most up to date technologies for ESI asset protection plus competency assessment, training and certification.

Technical Service and Support Packages





Enervac Corporation of Canada

World leader in the manufacture and development of processing and recovery systems for Insulating Oils and SF6 Gas. Enervac's range of high performance filtration and reprocessing equipment extends the life of the insulating liquid or SF6 with transformers, circuit breakers, or switchgear, removing contamination including Carbon Moisture, Sludge, Particulates and Breakdown products which enable the user to re-use the insulating medium rather than replenishing in new Oil or SF6, PLUS the environmental challenge of dealing with the associated waste management costs. Enervac's unique "corrosive sulphur" removal system for Transformer Oil regeneration is widely regarded as the reprocessing technology of choice for maintenance engineers throughout the globe.

Sulfur Hexafluoride (SF6) is an excellent gaseous dielectric for high voltage power applications. It has been used extensively in high voltage circuit breakers and other switchgear employed by the power industry. Applications for SF6 include gas insulated transmission lines and gas insulated power distribution substations. The combined electrical, physical, chemical and thermal properties offer many advantages when used in power switchgear. Some of the outstanding properties of SF6 which make its use in power applications desirable are:

- **high dielectric strength**
- **unique arc-quenching ability**
- **excellent thermal stability**
- **good thermal conductivity**

However advantageous the above properties are, Sulfur Hexafluoride is considered to be a fully fluorinated compound (FFC). Since FFC's have atmospheric lifetimes of up to 50,000 years, these potent greenhouse gases could contribute significantly and, essentially, permanently to global warming if emissions continue to grow. For example, let's compare the global warming potential of CO2 and SF6. CO2 has a global warming potential of 1, whereas SF6 has a global warming potential of 24,900!! Also, over the past year or so, the price of new SF6 gas has increased in price by as much as 600%!!

Due to the above reasons, SF6 is used mostly in applications that allow reclamation as opposed to using it on equipment that requires release of the gas, only to be re-filled with virgin SF6. ENERVAC produces a complete line of SF6 recovery and test equipment, from full sized gas reclaimers down to small decomposition detectors.



onsite HIGH VOLTAGE

onsite hv ag offers a wide range of products in the categories of Cable Testing and Diagnostics, Coil and Winding Insulation Diagnostics, and Transformer Diagnostics. The onsite hv group consists of several companies located in Switzerland: onsite hv solutions ag in Luzern, is an international organization of independent companies with a team of highly qualified specialists, providing knowledge of modern on-site solutions to distribution and transmission utilities. onsite hv international ag, is a distributor for innovative test and diagnostic tools to the Electrical Energy Industry and is a reliable partner for utilities, power suppliers and grid operators as well as producers of equipment for electrical grids.



Power cable testing and diagnostics

Cable Testing and Diagnostics is an effective way to assess the quality of new and service aged underground cable systems. We offer a range of systems applicable for medium and high-voltage power cables.



Winding and coil insulation diagnostics

Oil and Winding Insulation of electrical machines can be tested and diagnosed with our insulation test measurement systems.



Transformer diagnostics

Condition diagnosis of on load tap changers in power transformers with dedicated dynamic resistance measurement system.



Thermal Imaging Systems

Guangzhou SAT Infrared Technology Co. LTD (SATIR) is one of the world's leading civilian thermal imaging system manufacturers for a wide range of industrial, commercial and governmental applications including predictive and preventive maintenance, condition monitoring, non-destructive testing, research and development, temperature measurement and thermal testing.



HV Testing Equipment

Raytech GmbH has developed and produced portable measuring instruments with laboratory precision for the electrical testing industry, used for maintenance and acceptance testing of electrical high voltage apparatus. Their unique design approach has resulted in the development of highly regarded measuring instruments which have set new standards in the electrical testing industry.



Ultrasonic Leak Detection

CTRL Systems, Inc. designs and manufactures Ultrasonic Technology and Predictive Maintenance Solutions for Non Destructive Testing (NDT), Condition Based Monitoring (CBM), Quality Control and Leak Detection, in critical mechanical and electrical equipment. Turn-key implementation includes training, analysis software, data capture, and the UL101.

Service, Support, Repair and Recalibration

EMT deliver the very best instruments available on the market backed by the strongest support team in the industry.

While downtime and instrument availability remain at the forefront of many asset management strategies and objectives, the expanse of our service & support team means we are able to provide maintenance personnel with the highest level of technical-added-value to help them protect, preserve and enhance the life of the people, plant and equipment assets within their responsibility.

Our factory trained personnel have over 45 years experience in the field of SF6 and Transformer Oil Monitoring & Analysis. The team provide comprehensive service and support to clients including regular routine maintenance, fast-response breakdown cover, product training, calibration and validation qualification, and third party servicing.

Consulting, Seminars & Training

Having a high profile within the power delivery community has been instrumental to our positioning as a global market leader.

Consulting

- Our worldwide involvement with SF6 protocols and legislative guidelines, including participation in SF6 task forces with IEC, CIGRE, NEMA, ASTM and the EPA, have enabled us to impart our knowledge and expertise in this field. Our contribution to several working groups and forums have given us the opportunity to consult on challenges facing the industry, with technical papers presented at a number of meetings including the EPA SF6 Emission Reduction Partnership.

Seminars & Training

- Significant resource is invested in our own series of seminars and workshops, which have brought us together with organisations within the electric utility industry from all corners of the world. Our training program is designed to improve knowledge on the most up-to-date technologies for ESI Asset Protection and delivers competency assessments, training and certification. Our staff are certified in accordance with EC 305/2008 'Minimum Requirements for Personal Handling and Recovering SF6 from High Voltage Switchgear.'

Training and Demonstrations



■ Seminar in UAE



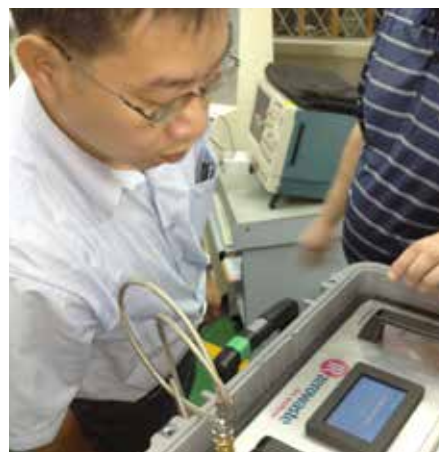
■ Training in Dubai



■ Zerowaste® Demonstration



■ Seminar in USA



■ Demonstration in Taiwan



■ Hands-On Training

1 Day Oil and SF6 Seminars for Electricity Maintenance Personnel

EMT invite all Utilities Maintenance Personnel to attend a 1 day programme presenting the most up to date methods and technologies for Transformer Oil & SF6 Analysis and Handling. With over 40 years experience delivering high voltage technology to the electric utility market, no-one is more qualified than EMT when it comes to understanding the practical issues and challenges of end users.

AGENDA: (Please tick your preferences)

Moisture & Acidity Measurement Technologies	<input type="checkbox"/>
Advances in Transformer Oil Regeneration	<input type="checkbox"/>
New Expertise in Cable Oil Purification	<input type="checkbox"/>
Oil and SF6 Recycling	<input type="checkbox"/>
SF6 Analysis and Topping Up Systems	<input type="checkbox"/>
SF6, Zerowaste and Smartfill EMT Products	<input type="checkbox"/>

All courses can be tailored to individual requirements. Please contact EMT to discuss your preferences

REGISTER TODAY!

Please contact us:
 Email: enquiries@emt.uk.com
 or call
 00 44 (0)7535 900214
www.emt.uk.com



■ EMT Seminar invitation



Energy Maintenance Technologies Ltd
Unit A6 Barton Industrial Estate
Barton le Clay
Bedfordshire
MK45 4RP
United Kingdom
Tel: + 44 (0) 7535 900214 | Tel: +44 (0) 7979 527292
Email: enquiries@emt.uk.com
www.emt.uk.com

EMT Americas
Email: enquiries@emtamericas.com
www.emtamericas.com

For details of EMT local distributors around the world email: enquiries@emt.uk.com

