MARKES international

TT24-7NRT™

Specification sheet

The TT24-7NRT is a near-real-time, tandem trap thermal desorption (TD) system for continuous sampling and concentration of volatile and semi-volatile organic vapours in air or gas.

1. System features

- **Tandem-trap continuous monitoring** – Two sorbent packed traps operate in tandem to ensure 100% sample coverage.
- **Standalone automatic sampling and pre-concentration** that can be connected to any make of GC, fast GC, and various real-time vapour detectors.
- **Compatible with gas-phase samples** ranging in pressure from below atmospheric to 50 psig.
- **Wide range of sampling flows** – up to 800 mL/min from atmospheric pressure samples offers high sensitivity with fast cycle time.
- **Electrical cooling** – delivers robust, reproducible cycle times and quantitative analyte retention without any liquid cryogen.
- **Optimised for fast cycle times** – as low as 5 minutes for single agent monitoring.
- **Multi-Gas enabled** – compatibility with helium, hydrogen and nitrogen carrier gas provides the flexibility to meet operational and analytical priorities.
- **Easy-change consumables, sub-ambient trapping, and efficient backflush desorption** deliver maximum flexibility with the same system supporting screening of wide-ranging target and untargeted lists, including analysis of highly volatile toxic industrial chemicals and less volatile chemical agents with a simple consumable change.
- **Inert, uniformly heated flow path** compatible with highly reactive nerve and blister agents at worker protection levels (WPLs) and general population limit levels (GPLs).
- **Ultra-rapid trap desorption** optimises separation and sensitivity delivering narrow peaks even under spitless analytical conditions.
- **Internal standard addition (optional)** – enables a precise aliquot (*via* a 1 mL loop) of gas phase standard to be added onto either focusing trap for accuracy, quality control, and instrument confidence.
- **Leak test:** automatic checks of the instrument without user intervention including both traps, tube, and split flows to ensure sample integrity, and provide data confidence.
- **Tube desorption mode** facilitates single sorbent tube analysis for confirmation and troubleshooting.
- **Re-collection of split flows** onto sorbent packed tubes enables simple method validation, troubleshooting and confirmatory analysis with a different detector.
- **Intelligent PC-based software optimised for remote deployment:** continuous system health monitoring and automated self-diagnostic routines support unattended operation. Preventative maintenance feedback indicates when parts could be replaced to avoid instrument downtime.

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2. Physical

Dimensions	H 45 cm (17.7″) × W 32 cm (12.6″) × D 52 cm (20.5″).
Weight	26 Kg (57 lb).

3. Gas selection

Carrier gas	0–60 psig of hydrogen, helium, or nitrogen at 2–500 mL/min.
Sample gas	Air, helium, and nitrogen.
Pneumatics gas	Dry (dew point –50°C or below) air or nitrogen in the range 50–60 psig.

4. Gas generator requirements*

Carrier gas	Minimum capacity 200 mL/min but will be method dependant. Purity 5.0 or better.
Pneumatics gas	150 mL/min continuous consumption. Minimum capacity of 1 L/min at 100 psi with integrated compressor and 2.5 m of 1/4” tubing to provide buffer volume to accommodate short term peak gas demand. Dew point <-50°C Purity 5.0 or better.

5. Sampling Flows

Atmospheric pressure source	20–800 mL/min .
Pressurised source	20–1000 mL/min.**

6. Operating Temperatures

Flow path	50°C–210°C.
Trap low	-30°C–50°C.***
Trap high	35°C–425°C.
Tube desorption	30°C–440°C.

7. Environmental operating conditions

Temperature	15°C–30°C.
Relative humidity	5–95% RH (non-condensing).
Altitude	Up to 2000 m (~6500 ft).

8. Operating requirements

Power	100–240 V, 50/60 Hz, 1200 W (TT24-7NRT self-adjusts to local voltage input).

9. Minimum PC Specification

For TD control:

- CPU: 1 GHz 64-bit dual-core or better.
- RAM: 4 GB.
- Hard disk space: 2 GB.
- Graphics card: DirectX 9 or later.
- Display: 1024 × 768 display.
- Operating system: Windows® 8.1, 10, or 11 64-bit, English.
- Other requirements: Windows-compatible keyboard and mouse, one free USB.

*Capacity stated is for a single TT24-7NRT and may need to be increased to accommodate supply for GC detectors such as FID, FPD, or additional TT24-7NRT instruments.

**A minimum of 5 psig is required at the sample inlet. Any pressure drop across sampling accessories, or an extended sampling line will need to be taken into account.

*** Trap low temperatures of –30°C may not be attainable under all operational conditions. Factors affecting the minimum temperature may include flow path temperature and sampling flow rates in excess of 100 mL/min.

10. Safety and regulatory certifications

- The instrument is designed and manufactured under a quality system registered to ISO 9001.
- The instrument complies with the essential requirements of the following applicable European and North American Directives, and carries the CE/UKCA marks accordingly:
  - Low Voltage Directive 2014/35/EU.
  - EMC Directive 2014/30/EU.
  - ROHS Directive 2015/863/EU.
- The instrument conforms to the following product safety standards:
  - IEC 61010-1:2010/EN 61010-1:2010.
  - IEC 61010-2-010/EN 61010-2-010:2014.
  - Canada: CSA C22.2 No.61010-1-12:2012.
  - USA: ANSI/UL 61010-1:2012.
- The instrument conforms to the following regulation on electromagnetic compatibility (EMC):
  - IEC/EN 61326-1:2021.

11. System options

U-TT24-7NRT: Twin-trap near-real-time thermal desorber with electronic flow control.

U-TT24-7NRT-IS: As above and includes factory fitted internal standard addition for introduction of gas-phase standard onto either focusing trap, providing improved precision of quantitative analysis.

12. Accessory and upgrade options

Sample pump
(U-ASPM1-H/U-ASPM2-H/U-ASPM3-H) to pull atmospheric pressure sample gas through the traps *via* the sample inlet.

Heated sample line (U-HSLTT) extends the sample inlet by 2 m to allow remote sampling. Sample line is heated to match flow path of 50°C–210°C.

In-line dryer (U-ASDRY-TT): Nafion™ dryer for monitoring ultra-volatile, non-polar compounds in humid atmospheres.

DAAMS tube conversion: Kit to convert TT24-7NRT for use with 4½″ tubes (U-35TO45KT).

For more information about our products and services, please visit www.markes.com.

Trademarks

TT24-7NRT™ is a trademark of Markes International. Nafion™ is a trademark of DuPont.

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