


**GERSTEL**


## Thermal Desorption System

# TDS 3

## Specifications

### TDS 3

#### Uses

The TDS 3 is an accessory for thermal desorption of adsorbent-filled tubes and for direct thermal extraction of liquids or solids (dynamic headspace) for subsequent sample introduction and GC or GC/MS analysis. Application areas are the determination of Volatile Organic Compounds (VOCs) and semi-volatile Organic Compounds (SVOC) in gas phase samples, in viscous liquids such as gels, and in solid samples.

#### System Configuration

- compatible with most standard GCs
- GERSTEL Cooled Injection System CIS is used for analyte focusing prior to GC or GC/MS analysis

#### Cooling Options

- LN<sub>2</sub> cooling<sup>1)</sup>
- LCO<sub>2</sub> cooling

#### Minimum Temperatures

- -50 °C (with LN<sub>2</sub> cooling)
- -50 °C (with LCO<sub>2</sub> cooling)

#### Temperature Programming

- 2 temperature ramps
- heating rate maximum 180 °C/min
- initial temperature -50 ... 400 °C
- 1. hold temperature -50 ... 400 °C
- 2. hold temperature 0 ... 400 °C
- hold time maximum 650 min for each hold temperature

<sup>1)</sup> Dewar vessel with 1.0–2.0 bar operating pressure mandatory.

#### Sample Transfer to Cooled Injection System CIS

- split
- splitless
- solvent venting

#### Transfer Line

- deactivated ProSteel® capillary, OD 0.7 mm
- length 150 mm (CIS 4)
- length 142 mm (CIS 3)

#### Transfer Temperature

- maximum 400 °C

#### Desorption Mode

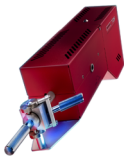
- Retain tube - Standby Cooling  
The tube remains in the TDS after desorption, the TDS is cooled to the standby temperature.
- Retain tube - no Cooling  
The tube remains in the TDS after desorption, the cryo cooling is switched off at GC start.
- Remove tube - no Cooling  
The tube is removed from the TDS after desorption, the cryo cooling is switched off at GC start.

#### Pneumatics

- Pressure release for sample loading and unloading
- Flow, pressure and split ratio controlled through the GC pneumatics, depending on the GC model, or through the CIS pneumatics.

#### Automation

- GERSTEL TDS A2 auto sampler



## Thermal Desorption System TDS 3

### Tube Types

- TDS tubes 178 × 6 × 4 mm (L × OD × ID)
- TDS tubes for GERSTEL Twister® 178 × 6 × 4,5 mm (L × OD × ID)
- 3.5 × 1/4" (L × OD) thermal desorption tubes with special tube adapters
- length of heated area approximately 80 mm
- made of glass or stainless steel
- empty or packed
- more detailed information is available in the Analytical Supplies catalogue

### Control

- based on one of the controllers C505 or C506
- in combination with the GERSTEL MAESTRO software, alternatively integrated in an Agilent® Technologies chromatography data system, or coupled to a chromatography data system from AB Sciex™ or Thermo Scientific®, or operated in stand-alone mode
- only one method and one sequence table required for the complete system including GC/MS when integrated in the ChemStation software

### Regulatory Certifications and Standards

- DIN EN 61010-1/A2:1996
- DIN EN 61326:2004-05
- IEC 61010-1:1990/A1:1992/A2:1995
- IEC 61326:2002
- UL STD 3101-1;93
- CAN/CSA C22.2 NO.1010.1-92

### Operating Conditions

- 15 ... 35 °C
- relative humidity max. 50-60%, non-condensing
- max. 4615 m above sea level

### Storage Conditions

- -20 ... 50 °C
- relative humidity max. 50-60%, non-condensing
- max. 4615 m above sea level

### Dimensions (L × H × W)

- 335 × 121 × 82 mm

### Weight

- 1.2 kg

### Power Consumption

- max. 200 Watt

### TD Pneumatics Box

- switches between TDS split and CIS split
- 4 LEDs provide quick status overview
- 1 × output to CIS pneumatic
- 1 × TDS split input
- 1 × CIS split input
- 1 × valve control interface
- 1 × pneumatic control interface
- dimensions 200 × 100 × 175 mm (L × H × W)
- weight 1.5 kg

### High Performance Auxiliary Modules

- TDS A2  
for automated processing of up to 20 TDS tubes
- Thermo Extractor TE 2  
for thermal extraction of solid or viscous samples. The sample is heated and analytes are transferred to a TDS adsorbent tube using a carrier gas flow
- Tube Conditioner TC 2  
for simultaneous thermal conditioning of up to ten TDS tubes or up to 50 Twisters® under a flow of inert gas
- Gas Sampling System GSS  
2-channel, hand-held air sampling system to collect air samples on customary adsorbent tubes.
- Pyrolysis Module PM 1  
manual pyrolysis module for the TDS, enabling thermal extraction of VOCs and subsequent interference free Pyrolysis
- Tube Standard Preparation System TSPS  
for preparation of solvent-free thermal desorption standards
- Tube Spiking System TSS  
for preparation of solvent-free thermal desorption standards using the Multi Purpose Sampler MPS
- Thermal Desorption tube adapter  
for thermal desorption of 3.5" × 1/4" (L × OD) thermal desorption tubes made of glass or steel
- Direct injection adapter  
allows direct injection of liquid standards into the TDS using a syringe

### Available TDS 3 Models

- TDS 3C  
Thermal Desorption System with peltier or cryostatic cooling option
- TDS G  
Thermal Desorption System configured for direct air sampling and thermal desorption used for on-line air monitoring.