C180-E095A

SHIMADZU
Excellence in Science

Headspace Sampler

HS-20 NX series

Specifications

Next Industry Standard

The HS-20, developed as the best solution for volatile component analysis, has been improved and introduced as the NX series. The excellent basic performance and user-friendly design provide a powerful solution for scientists in both research and quality control laboratories.

HS-20 NX Loop model

HS-20 NX Trap model

Advanced basic performance

The high temperature stability of the oven, the short transfer line structure, and isolation gas flow*1 that prevents diffusion from the vent flow path ensure the best analytical performance in its class.

Analytical performance

HS-20 NX Trap/Loop model

- Area repeatability: < 0.7% RSD *2
- Carryover: < 0.0001% *3

HS-20 LT (Long transfer) model

- Area repeatability: < 1.0% RSD *2
- Carryover: < 0.15% *3

*1: HS-20 NX Trap/Loop model only.
*2: Results of repeated analysis of ethanol in water by GC-FID system. The value varies depending on conditions.
*3: Analysis results of DMSO and water solvent by GC-FID system. The value varies depending on conditions.

Trap mode

The trap model allows highly sensitive analysis with sample concentration by electronic cooling. You can easily switch between trap and loop modes depending on your analysis needs.

- Electronic cooling temperature range: -30 °C to 80 °C (Dependent on sample line temperature)
- Heating temperature range: 0 to 350 °C
- Increments: 1 °C, Accuracy: ±1 °C
- Switching Traps/Loops with method file settings

Sample handling

Vial capacity/Sample tray

- 90-vial capacity *4
- Additional vials for priority analysis *5
- 200 mm high accessible sample tray
- Barcode reader option available

*4: Operation was confirmed when 90 20-ml vials were filled with 10 ml of water and 3 g of salt.
*5: Available on GCMSsolution™ as of June 2021.

Vial oven

- 12-position oven for simultaneous heating
- Automatically optimized overlap analysis

Sample vial

- Vial outer diameter: 22.4 to 23.1 mm *6
- 10 mL vial: minimum height 47 mm *6
- 20/22 mL vial: maximum height 79 mm *6
- Bottom shape: Round
- Cap shape: Screw/Crimp
- Cap material: Magnetic/Non-Magnetic Metal
- Adaptor-free compatibility
- Auto-detection of vial size
- Different vial sizes can be mixed in a sample tray

*6: Vial dimensions include cap and septum

Type of trap adsorbent

- Standard trap adsorbent: Tenax® TA
- Optional adsorbents:
  Carbopack™ Y, Tenax TA + Carboxen® 1000,
  Carboxen 1000, Carbopack B + Carbosieve® S3
- Trap tube:
  3.2 mmOD (2.1 mmID) x 102 mm Sulfinert® Tube

Analytical parameters

Analysis Mode

- Static headspace
  Overlap analysis for optimizing analysis cycle time.
  - Single extraction
  - Multiple injections (Up to 10)
- MHE/Multiple headspace extraction (Up to 10)
- Method development mode
  (Vial equilibrium temperature/time Setting)

Sample flow path

- Sample loop: 1.0 mL (Standard)
  0.2/0.4/0.5/0.8/2.0/3.0 mL (Options)
- Transfer line length: 300 mm
  (LT Model: 1500 mm, capillary column used)
- Integrated splitter without additional injection port
  (In the case of HS-20 LT, some configurations use an inlet.)
- Loop/flow path material:
  Sulfinert treatment, chemically inactive surface
- Needle material:
  Sulfinert treated needle (Standard)
  Xtra Life HS Needle, anti-corrosion (Option)
- Column size compatibility:
  capillary column with 0.05 to 0.53 mm ID
- Column connections: GVF (Standard)
  ClickTek™ NX, Graphite ferrule (Options)
- Clean purge of the sample/vent flow path with isolation gas/needle flash

Temperature control

- Vial oven temperature: room temperature + 10 to 300 °C
  Increments: 1 °C, Precision: ±0.1 °C
  Up to 12 vials can be heated at once.
- Vial shaking: Off/Level 1 to 5
- Sample line temperature*7:
  High temperature mode: 150 to 300 °C (Initial setup)
  Medium temperature mode:
  Room Temperature + 10 to 220 °C
  Increments: 1 °C, Precision: ±0.5 °C
  High/medium temperature mode can be switched by software.
- Transfer line temperature*8:
  room temperature + 10 to 350 °C
  Increments: 1 °C, Precision: ±0.5 °C

*7: for HS-20 LT, only supports medium temperature mode.
*8: Room temperature + 10 to 200 °C for HS-20 LT
Refer to the previous section for the temperature control specifications of the trap mode.

Timing control

- GC analysis cycle time: 0.0-999.9 min
- Vial pressurization time: 0.0-9.99 min
- Vial pressurization equilibrium time: 0.0-9.99 min
- Load time: 0.0-9.9 min
- Load equilibrium time: 0.0-9.9 min
- Injection time: 0.0-999.9 min
- Needle flush time: 0.0-99.9 min
- Increments: 0.1 min

Pneumatic control

The use of the latest electronic advanced flow controller (AFC) and advanced pressure controller (APC) ensures a clean flow path and high control stability.

- AFC Carrier Gas Control
  Pressure unit: psi, kPa, bar
  Pressure range: 0 to 970 kPa
  Increments: 0.1 kPa/0.001 psi
  Carrier gas type: He, N_2, H_2 (> 99.995%)
  Control mode: constant pressure, constant flow rate, constant linear velocity
  Injection mode: Split, Splitless, High Pressure Injection
  Carrier gas flow rate range:
  He: 0 to 1300 mL/min, N_2: 0 to 600 mL/min,
  H_2: 0 to 1300 mL/min
  Support for gas saver mode
- APC vial pressurizing gas control:
  Pressure range: 0 to 500 kPa (Vial pressure dependent)
  Increments: 0.1 kPa/0.001 psi
  Pressurizing gas type: He, N_2 (> 99.995%)
- APC Trap dry purge gas control:
  Pressure range: 0 to 500 kPa (Vial pressure dependent)
  Increments: 0.1 kPa/0.001 psi
  Dry purge gas type: He, N_2 (> 99.995%)

For detailed information on AFC/APC, refer to separate specifications.

System information

System Check/Data Integrity

- Automatic needle clogging check
- Automatic vial leak check: For all vials
- Vials not-detected behavior: Skip, Stop
- Analysis log recording per vial
- Barcode reader (Options):
  Compatible with JAN/EAN8, JAN/EAN 13, UPC-A, UPCE
- Maintenance/service parts logs/counters
- Support for simple maintenance mode
- Automatic diagnostics at system startup

GC/GCMS Connectivity

- Supported GC Models*9:
  Nexis™ GC-2030, GC-2010 series, GC-2014 series, GC-2025
  (Some models unavailable in some regions)
- Supported GCMS Models:
  GCMS-QP 2020 (Include NX Series)
  GCMS-TQ™ 8050/8040/8030 (Include NX Series)
  GCMS-QP 2010 Series
- Connectivity: USB, Start/Ready Cable

*9: GC-2014 series and GC-2025 are supported by HS-20 LT only.

Supported Software/OS (As of June 2021)

- LabSolutions™ LC/GC, LabSolutions GCMS
- GCMSsolution
- Empower™3 (Waters Corporation)
- OpenLab™ CDS (Agilent Technologies, Inc.)
- Thermo Scientific™ Chromeleon™ 6.8/7.2 CDS software (Thermo Fisher Scientific Inc.)
  All software support FDA 21 CFR Part 11
- Compatible OS: Windows® 10 (32/64 Bit)

System

Size and weight

- Width: 553 mm/21.8 in
- Depth: 543 mm/21.4 in
- Height: 440 mm/17.3 in
- Weight:
  Loop/LT Model: 33 kg/72.8 lbs
  Trap Model: 40 kg/88.2 lbs

Power requirements

- Voltage: AC100-120 V/220-240 V
- Frequency: 47 to 63 Hz
- Power supply drift: < ± 10%
- Ground: < 100 Ω
  (GC/PC and equipotential ground)
- Power consumption:
  Loop/LT models: 1200 VA max.
  Trap model: 1500 VA max.

Environmental requirements

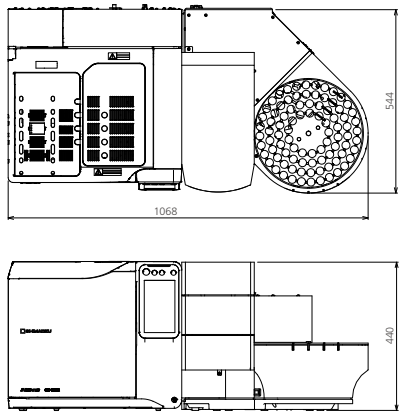
- Operating temperature: 15 to 30 °C
  Performance guaranteed temperature:
  18 to 28 °C, temperature variation
  within ± 1.3 °C
- Operating humidity: 20 to 70% RH
- Pollution degree: 2 or less (IEC 60664 -1)
- Maximum operating altitude:
  2000 m or less

Safety/regulatory certifications

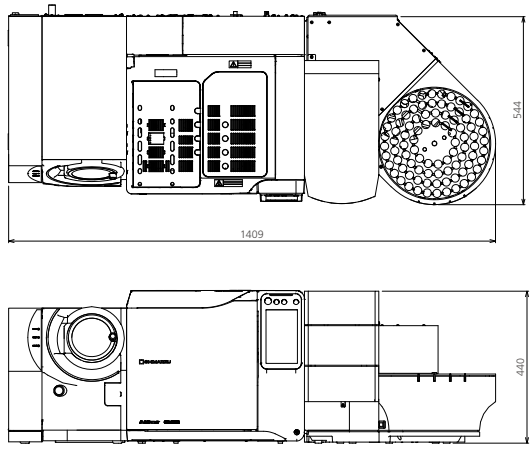
- International Electrotechnical
  Commission
  (IEC 61010-1, IEC 61010-2-010,
  IEC 61010-2-081)
- CE Marking
  (Compliance with EU standards)
- EMC (EN 61326-1)
- RoHS compliance in Europe and China
- KC mark (Korea EMC)

Example of system dimensions

- Nexis GC-2030 + HS-20 NX
  Width: 1068 mm/42.1 in
  Depth: 543 mm/21.4 in
  Height: 440 mm/17.3 in



- GCMS-QP 2020 NX + HS-20 NX
  Width: 1409 mm/55.5 in
  Depth: 544 mm/21.4 in
  Height: 440 mm/16.9 in



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