Gas sampler

Compact, easy-to-use devices for physically correct
gas volume measurement according to VDI guidelines

SARSTEDT

Sampling of gases and air pollutants

DESAGA gas samplers are used for taking the accurate volume of gaseous samples for emission and immission measurements, searching for pollutants at the workplace – MAK (maximum workplace concentration) checks – and for testing process gases.

Waste incineration and sewage treatment plants, power plants, the chemical industry and automobile manufacturers are among the users as well as technical monitoring associations, trade supervisory authorities and environmental protection authorities. DESAGA gas samplers are used in industry and research in the monitoring laboratory and in materials testing – in short, wherever gases and gaseous components are of interest.

The design of the DESAGA gas samplers guarantees reliable and physically correct measurement of the sample volume. A microprocessor carries out the management and control of the sampling. The gas flows at the point of removal into the collector, for example into one of several wash bottles connected in series. The vacuum necessary for conveying the gas is generated by a built-in gas-tight diaphragm pump. The required pumping power heats the gas and changes its volume. Therefore, before reaching the volume measuring module, it flows through a gas cooler, in which it is cooled down again to ambient temperature. In addition, the gas temperature and the ambient pressure are measured. The conversion to standard volume can be carried out automatically.

The volume measuring module works according to the proven bellows principle of dry gas meters. The gas leaves it under the air pressure prevailing at the sample location. Since the pressure drop in the volume measuring module is negligible, a pressure correction of the gas volume to measuring conditions is not necessary.

The DESAGA gas samplers contain all the components required for simple and reproducible work:

- Absorber with glass frit filter to protect the pump and the volume measuring module from corrosive components
- Pump for delivering the sample
- Flow sensor and control valve for precise flow control
- Cooler and fan for adjusting the temperature of the gas sample to ambient temperature
- Volume measuring module with electronic scanning
- Temperature sensor (circuit board resistor)
- Alphanumeric display of all parameters
- Buffer battery for storing the measurement logs
- Processor for controlling and monitoring all functions
- Remote control
- RS 232 interface

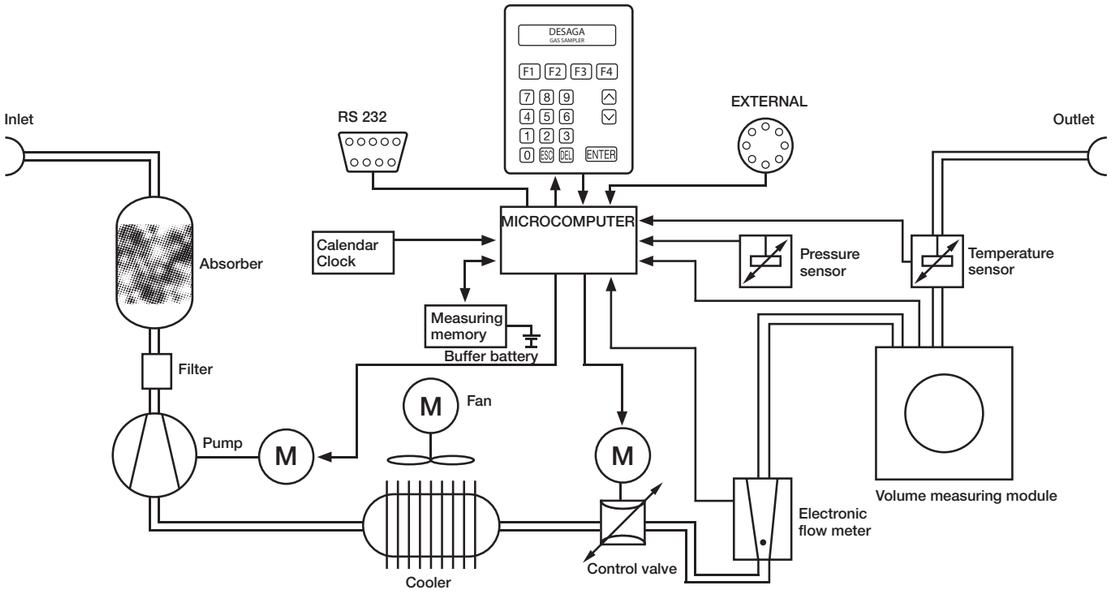
In automatic operation, DESAGA gas samplers can be used unattended – even with remote control – for sample volumes of up to 9999 litres.

Depending on the flow resistance of the probes, filters and separators, sample gas flows of 6 to 720 l/h can be reached during operation of the devices. This covers the range included in numerous VDI directives and various national and international regulations.

The wide range of accessories makes it possible to assemble the optimal measuring station for every problem.

DESAGA wash bottles facilitate the preparation of the samples in the laboratory, guarantee trouble-free sampling and protect the samples for transport in the DESAGA transport box.

Gas flow chart / VDI guidelines



List of the most important VDI guidelines for measuring pollutants with gas samplers

VDI 2449 Definition of terms
VDI 2451 Sulphur dioxide
VDI 2452 Fluorine and inorganic gaseous fluorine compounds
VDI 2453 Nitrogen monoxide and dioxide
VDI 2454 Hydrogen sulphide
VDI 2455 Carbon monoxide
VDI 2456 Nitrogen monoxide and dioxide
VDI 2457 Determination of organic compounds
VDI 2458 Chlorine
VDI 2461 Ammonia
VDI 2462 Sulphur dioxide
VDI 2463 Particles in the air
VDI 2467 Primary and secondary amines
VDI 2468 Ozone and peroxide
VDI 2470 Fluorine
VDI 2589 Chlorinated hydrocarbons
VDI 3462 Woodworking and wood finishing
VDI 3480 Hydrogen chlorides
VDI 3481 Determination of organic carbon in exhaust gas
VDI 3482 Measurement of gaseous immissions
VDI 3484 Measurement of aldehydes
VDI 3485 Measurement of phenols
VDI 3486 Hydrogen sulphide
VDI 3487 Carbon disulphide
VDI 3488 Chlorine
VDI 3495 Carbon
VDI 3496 Sulphuric acid
VDI 3863 Acrylonitrile
VDI 3865 Halogenated hydrocarbons in soil

DESAGA devices comply with the VDI guidelines and are used by the competent institutions

DESAGA gas sampler GS 312

The universally usable gas sampler GS 312 is a fully automatic device for physically correct gas volume measurement according to VDI guidelines.

The GS 312 contains all the important components and functions for accurate and reproducible measurement results:

- Clearly structured operating menu
- Microprocessor for controlling and monitoring sample collection
- Electronic flow sensor and control valve for precise flow control from 1 to 12 l/min
- Gas temperature measurement using a PT 100 resistance thermometer, accuracy of ± 0.2 °C
- Measurement of ambient pressure for direct conversion to standard volume
- Data storage for up to 20 measurements
- Measurement log for date, time, sample number, volume, time, temperature in the gas clock and error message
- Manual, timer and remote control
- RS 232 interface

A measurement can be started via keyboard, via the built-in remote control socket or at a predetermined time.

Furthermore, an easily replaceable large-volume absorber vessel protects the device components from pollutants and moisture (a filling with 300 ml of silica gel can reliably absorb the water vapour from 1000 l of gas at 20 °C). Corrosion-resistant glass frits serve as dust filters.

Thanks to a powerful ventilation system with a large-area gas cooler and carefully adjusted air flow, the gas module is brought to ambient temperature in a few minutes.

The gas sampler GS 312 requires only a DC voltage of 15 V at a maximum of 2.4 amps for power supply. The 15 V power supply GN 100 – 240/12 is included in the scope of delivery.

The device is compact and easy to carry – ideal for strenuous field use. The sturdy sheet steel case protects against shocks and weather effects.

DESAGA gas sampler GS 212

The gas sampler GS 212 is the universally usable standard version, equipped with the most important components and functions of the GS 312. The flow rate of the GS 212 is adjusted manually using a fine control valve and flow meter.

DESAGA gas sampler GS 301

The gas sampler GS 301 was developed specifically for working with sample tubes. It consists of the basic device, onto which easily exchangeable sample changers for many different tube lengths and diameters can be placed. They can be pre-loaded in the laboratory and hold up to 10 tubes. For each measuring tube, all measurement parameters and start specifications can be programmed individually; it is also possible to start the subsequent measurements at intervals.

- VDI compliant design guarantees reliable and physically correct measurement
- Clearly structured operating menu for custom programming
- Microprocessor-based sampling management and control
- Thermal mass flow meter with control valve from 0.1 to 1.5 Nl/min
- Data storage for up to 10 measurements
- Measurement log for date, time, sample number, volume, flow, time, tube position, measurement program number and error messages
- Remote control
- RS 232 interface
- Electricity via power supply

Gas sampler – Technical data

	GS 212	GS 312	GS 301
Pre-selectable parameters:			
Flow rate:	1–12 l/min, mechanically controlled	0.2–12 l/min, electronically controlled	0.1–1.5 Nl/min, electronically controlled
Flow quantity	1–9999 l	1–9999 l	0.1–999.9 l
Delivery time	1–999 min or 10–9999 min	1–999 min or 10–9999 min	1 min–99 h
Start time	0:00–23:59 hours	0:00–23:59 hours	0:00–23:59 hours
Access code:	selectable	selectable	selectable
Operating, standard, AGW (WEL) litres	no	selectable	yes
Measured values			
Flow:	1–12 l/min ±0.5 l/min	0.2–12 l/min ±0.5 l/min	0.1–1.5 Nl/min
Volume:	1–9999.0 l ±2%	0.1–9999.0 l ±2%	0.1–999.0 l ±2%
Duration:	1:00–999:00 min or 10:00–9990:00 min	1:00–999:00 min or 10:00–9990:00 min	1:00–99:00 min
Ambient temperature:	no	no	no
Gas temperature:	-10.0 to +80.0 °C ±0.2 °C	-10.0 to +80.0 °C ±0.2 °C	no
Ambient pressure:	no	500–1100 hPa ±2 hPa	no
Differential pressure:	no	no	no
Protocol	Date, time, volume, duration, 6-digit sample number, possibly error message	Date, time, volume, flow, duration, air pressure, 6-digit sample number, possibly error message	Date, time, volume, flow, duration, 4-digit sample number, tube position, possibly error message
Log memory	20 measurements	20 measurements	10 measurements
Data output	Display or serial printer on RS 232	Display or serial printer on RS 232	Display or serial printer on RS 232
Remote control	yes	yes	yes
Absorber vessel	350 ml	350 ml	no
Volume measuring module	Bellows gas meter	Bellows gas meter	Thermal mass flow meter
Cooler and fan	yes	yes	no
Housing	Sheet steel case	Sheet steel case	Plastic
Operating hours counter	no	no	yes
Dimensions (W x D x H)	410 x 220 x 330 mm	410 x 220 x 330 mm	212 x 255 x 167mm
Weight	10 kg	13 kg	4.5 kg
Power supply	15 V max. 2.4A or power supply unit	15 V max. 2.4A or power supply unit	15 V or power supply unit
Workspace	20–80% relative humidity 0 to +50 °C	20–80% relative humidity 0 to +50 °C	20–80% relative humidity 0 to +50 °C

Ordering information

Order number	Name
90.170.300	Gas sampler GS 312, 15 V, incl. power supply GN 100-240/15 V
90.170.310	Gas sampler GS 212, 15 V, incl. power supply GN 100-240/15 V
90.170.350	Gas sampler GS 301, 15 V, incl. power supply GN 100-240/15 V, without sample changer
92.170.352	Sample changer type B/G for GS 301, for tubes 7 x 125 mm
92.170.353	Sample changer type N for GS 301, for tubes 6 x 70 mm
92.170.354	Sample changer type ADT for GS 301, for tubes 6 x 89 mm
92.170.355	Sample changer type GE for GS 301, for tubes 6 x 178 mm
92.170.356	Sample changer type W for GS 301, for wash bottles
170191	Absorber vessel GS 212/312

DESAGA thermal printer

DESAGA thermal printer

The thermal printer with 230/6 power supply and connection cable serves as a protocol printer and is connected to the serial interface (RS 232) of the gas samplers. The compact, handy design makes it easy to use on site. The thermal printer can be operated both on the mains and via the built-in batteries. If the power is supplied via the power supply unit, the internal battery is automatically charged. Approx. 1500 lines can be printed on a single charge.

Technical data for the thermal printer

Printing system:	Moving thermal head
Max. Characters per line:	27
Print width:	46 mm
Print speed:	approx. 0.8 lines per second
Dimensions (W x D x H):	135 x 130 x 64 mm
Weight:	350 g
Power supply:	4.8 V (600 mAh, NiCd battery)

Ordering information

Order number	Name
90.189.720	Thermal printer with 230/6 V power supply and connecting cable
90.188.055	Paper roll, 5 pieces

DESAGA Wash bottles and wash inserts made of DURAN® borosilicate glass

The DESAGA wash bottles facilitate the preparation of the matrices in the laboratory, guarantee trouble-free sampling and secure the samples for transport. All parts are connected with ISO glass threads and secured by screw cap or screw connection caps and PTFE seals. Jamming or accidental loosening of components, as can happen with ground joints, is excluded.

4 wash bottles of 30, 100, 250 and 500 ml volume and three wash inserts, plus an aerosol separator and an impinger insert, allow the optimal combination for every task. Frames and transport boxes are available for all wash bottle sizes.

Due to the shaping of the wash area, intensive contact of the phases is achieved and labour-saving, efficient working is ensured. All components are interchangeable and compatible with metric PTFE, glass and metal leads. As a result, series connections with one another and with other devices are easy to establish.

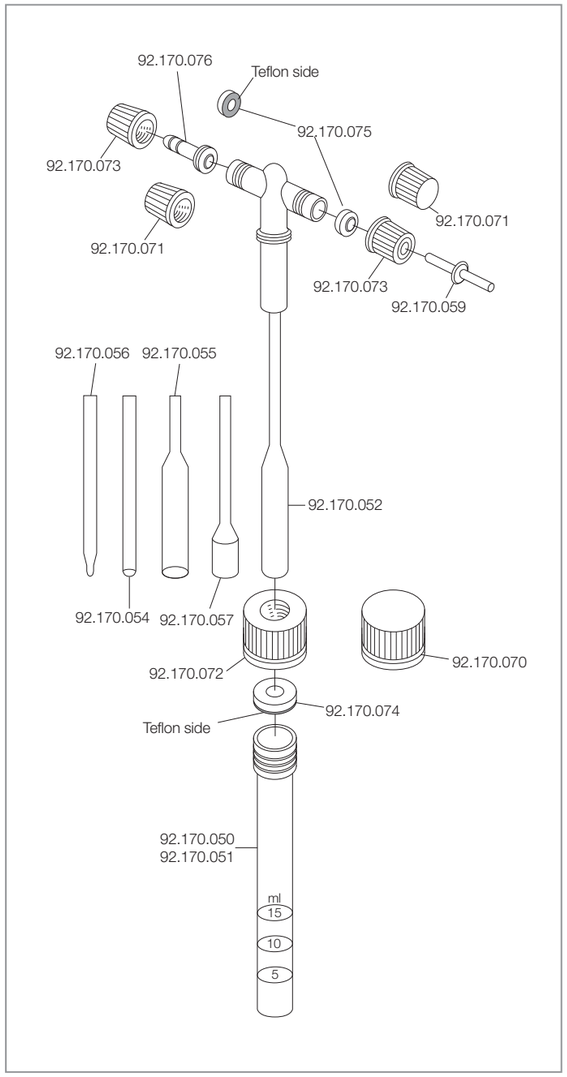
The 30 ml wash bottle is used in particular to enrich small amounts and for evaluation with the gas chromatograph. The 100 ml bottle is sufficient for spectrophotometric and titrimetric analyses.

For long-term measurements or heavy loading of the gas flow, it is recommended to use size 250 or 500 ml.

The wash bottles can be filled in the laboratory and connected to each other there. At the sampling point, the caps are screwed on and the connections with the gas samplers established. Just as easily, the caps are put back on after sampling and the thus secured samples are taken for analysis in the transport box.

DESAGA wash bottles and wash inserts – detail view

System description of the wash bottles and wash inserts



Wash bottle with MUENCKE wash insert, **complete**

DESAGA wash bottles and wash inserts

Wash bottle inserts

1. Impinger insert

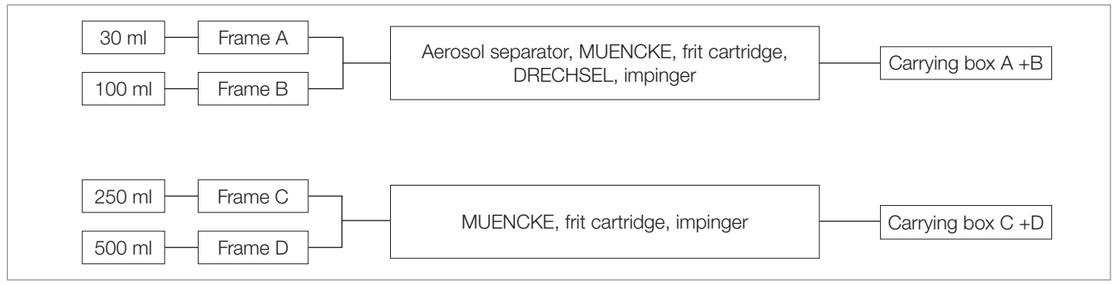
2. Drechsel wash insert

3. Aerosol separator

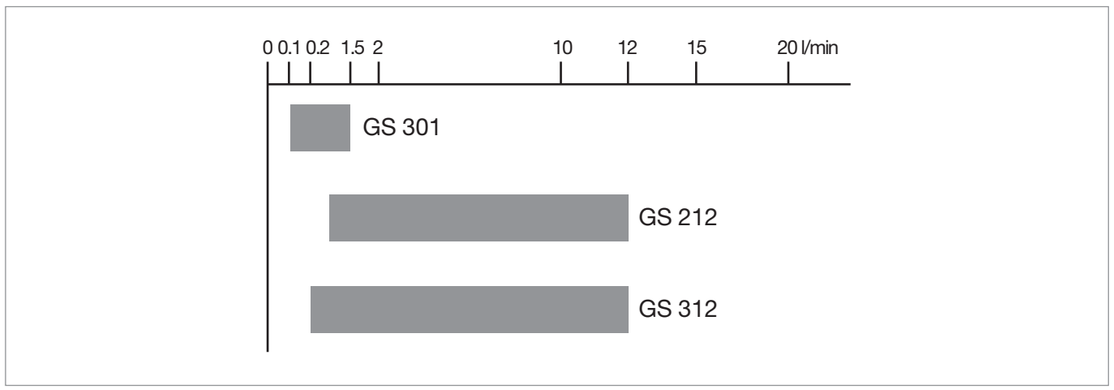
4. MUENCKE wash insert

5. Wash insert frit cartridge G 2

Configuration options for wash bottles and accessories



Delivery capacity



Ordering information

For initial equipment and as a trial set

Order number	Name
92.170.065	Wash bottle and wash insert set
Consisting of:	
92.170.080	Transport box
92.170.081	Frame A for 3 x 30 ml wash bottles
92.170.082	Frame B for 3 x 100 ml wash bottles
92.170.050	3 wash bottles 30 ml
92.170.051	3 wash bottles 100 ml
92.170.052	1 MUENCKE wash insert
92.170.057	1 wash insert with frit cartridge G2
92.170.054	2 Drechsel wash inserts
92.170.055	1 aerosol separator
92.170.056	1 impinger insert
19621	5 metres Tygon hose, 4.8 x 1.6 mm
92.170.059	10 connecting pipes
92.170.076	10 plastic olives, straight
92.170.071	10 screw caps GL 14
92.170.070	10 screw caps GL 25
92.170.073	10 screw connection caps GL 14
92.170.072	10 screw connection caps GL 25
92.170.075	10 silicone gaskets for GL 14
92.170.074	10 silicone gaskets for GL 25

Wash bottle with wash insert, complete

Order number	Name
92.170.1XX	Wash bottle X ml with X wash insert, complete
Consisting of:	
92.170.XXX	1 wash bottle
92.170.XXX	1 X wash insert
92.170.XXX	1 screw connection cap
92.170.XXX	1 silicone gasket
92.170.071	2 caps
X varies by type and size	

Wash bottles and wash inserts, accessories

Order number	Name
92.170.050	Wash bottle 30 ml, graduated 5, 10 and 15 ml, 5 pieces
92.170.051	Wash bottle 100 ml, graduated 20 and 30 ml, 5 pieces
92.170.141	Wash bottle 250 ml, graduated 50, 100, 150, 200 and 250 ml
92.170.142	Wash bottle 500 ml, graduated 100, 200, 300 and 400 ml
92.170.052	MUENCKE wash insert for 30 or 100 ml wash bottle, 5 pieces
92.170.143	MUENCKE wash insert for 250 or 500 ml wash bottle
92.170.056	Impinger wash insert for 30 or 100 ml wash bottle, 5 pieces
92.170.144	Impinger wash insert for 250 or 500 ml wash bottle
92.170.057	Frit cartridge G2 wash insert for 30 or 100 ml wash bottle, 5 pieces
92.170.145	Frit cartridge G2 wash insert for 250 or 500 ml wash bottle
92.170.054	Drechsel wash insert 30/100 for 30 or 100 ml wash bottle, 5 pieces
92.170.055	Aerosol separator 30/100 for 30 or 100 ml wash bottle, 5 pieces
92.170.059	Connection tube, 6 x 45 mm, 10 pieces
92.170.149	Flexible connection (alternative for 92.170.059), incl. 2x screw cap GL14
92.170.076	Plastic olive, straight, 10 pieces
92.170.071	Screw cap GL 14, 10 pieces*
92.170.073	Screw connection cap GL 14, 10 pieces*
92.170.075	Silicone gasket with PTFE sleeve GL 14, 10 pieces*
92.170.070	Screw cap GL 25, 10 pieces**
92.170.072	Screw connection cap GL 25, 10 pieces**
92.170.074	Silicone gasket with PTFE sleeve GL 25, 10 pieces**

Wash bottles and wash inserts, accessories

Order number	Name
92.170.148	Screw cap GL 45 ***
92.170.146	Screw connection cap GL 45 ***
92.170.147	Silicone gasket with PTFE sleeve GL 45 ***
92.170.150	Wash bottle 30 ml with MUENCKE wash insert, complete
92.170.151	Wash bottle 100 ml with MUENCKE wash insert, complete
92.170.135	Wash bottle 250 ml with MUENCKE wash insert, complete
92.170.136	Wash bottle 500 ml with MUENCKE wash insert, complete
92.170.152	Wash bottle 30 ml with impinger wash insert, complete
92.170.153	Wash bottle 100 ml with impinger wash insert, complete
92.170.137	Wash bottle 250 ml with impinger wash insert, complete
92.170.138	Wash bottle 500 ml with impinger wash insert, complete
92.170.154	Wash bottle 30 ml with frit cartridge G2 wash insert, complete
92.170.155	Wash bottle 100 ml with frit cartridge G2 wash insert, complete
92.170.139	Wash bottle 250 ml with frit cartridge G2 wash insert, complete
92.170.140	Wash bottle 500 ml with frit cartridge G2 wash insert, complete
92.170.081	Frame A for 3 wash bottles, 30 ml
92.170.082	Frame B for 3 wash bottles, 100 ml
92.170.085	Frame C for 3 wash bottles, 250 ml
92.170.086	Frame D for 3 wash bottles, 500 ml
92.170.080	Transport box for frames A and B
92.170.079	Transport box for frames C and D

* for connecting a wash insert
** for wash bottle 30 or 100 ml
***for wash bottle 250 or 500 ml

Notes

If you have any questions,
we'd be pleased to help you.

Sold by:

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