



Portable sampling system PSS-STS

Portable Sampling System PSS-STS

for the determination of total mercury concentrations in flue gases

Special Features

- **Two parallel sampling channels for traps with 10 mm diameter and up to a length of 400 mm**
- **Simple replacement of the traps**
- **Automatic leakage tests before and after the collecting cycle**
- **Designed for short- and long-term measurements up to 2 weeks**
- **Flow rates from 2 to 87 NI/h**
- **Peltier cooler for condensate separation**
- **Control and cooler unit in two mobile and portable plastic cases**
- **Ready for operation incl. warm-up phase in 30 minutes**
- **Suitable for monitoring of low emission limits**

Application

The portable sampling system PSS-STS (Sorbent Trap Sampler) meets the requirements of DIN CEN/TS 17286:2019-07 (mercury measurement with Sorbent Traps). In this mercury measurement, a defined volume flow is directed through two traps. The use of two Sorbent Traps in independent parallel gas paths ensures a high reliability of the measurement results. The traps are divided into up to six sections. The criteria which these sections must meet are defined in the relevant regulations. The analysis of the Sorbent Traps is carried out in the laboratory.

Typical applications are sampling of flue gases from combustion plants. Mercury measurement with sorbent traps is a very efficient method for the detection of mercury in flue gases.

Description

The portable sampling system PSS-STS is a reliable and precise sampling system which is used for the determination of total mercury concentrations in flue gases.

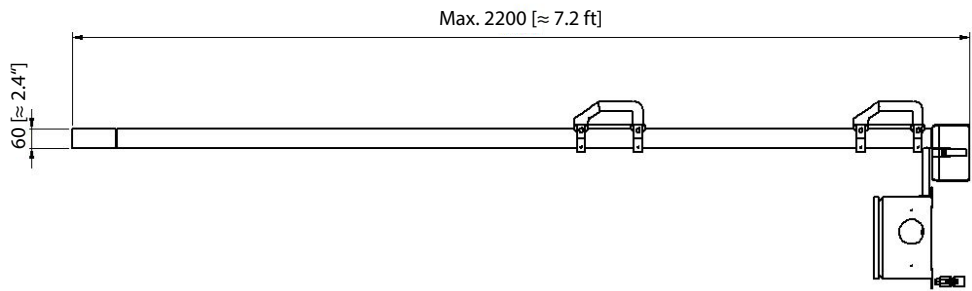
The Sorbent Traps are inserted into the heated probe and removed after a defined and programmed collection cycle. If required, the probe can be equipped with new traps for further collection cycles. The traps in the probe are tested for gas tightness before and after each collection cycle.

The device is controlled by a front-panel PC and an internal programmable logic controller (PLC). All relevant data is recorded and can be exported in the form of a measurement protocol.

Downstream of the probe, there is a cooler to separate the condensate. For volume control of the flue gas, pumps and mass flow controllers (MFCs) are controlled by the PLC.

The main components of the system are the sample probe for the Sorbent Traps, the heated sample gas line, the cooler, the volume flow control, the vacuum sensors, the peristaltic pumps for condensate removal, the filter and the electronics.

Calibration routines and system integrity checks are performed semi-automatically or manually using the user-friendly software.

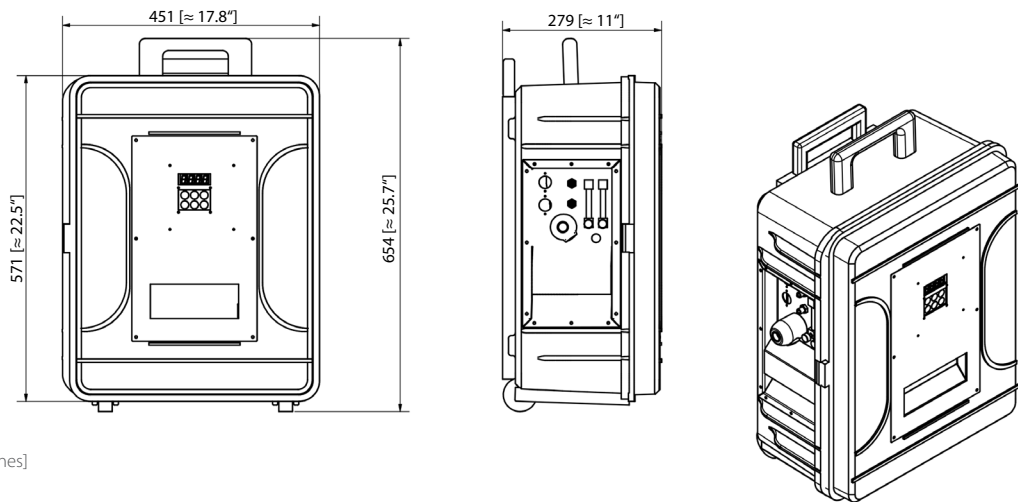


Dimensions in mm [Inches]

Technical Data

Portable Sampling System	Sample Probe PSP-STS		
Immersion depth	1 m [≈ 3.3 ft]	1.5 m [≈ 4.9 ft]	2 m [≈ 6.6 ft]
Part No. for 230 V AC	07A2340	07A2350	07A2360
Part No. for 115 V AC	07A2340a	07A2350a	07A2360a
Sampling temperature	Up to +200 °C [392 ° F]		
Ambient temperature	+5 to +40 °C [41 to 104 °F]		
Temperature controlling	Via control unit		
Ready for operation	After 30 min.		
Time for cooling to +50 °C [≈ 122 °F]	Approx. 1 hour until sample probe reaches approx. +50 °C [≈ 122 °F]		
Connection gas OUT	Tube connection DN 4/6 stainless steel		
Number of Sorbent Traps	For two traps with a length of approx. 400 mm and Ø 10 mm		
Heating capacity	1200 W		
Power supply	230 or 115 V AC		
Electrical connection	2 m [≈ 6.6 ft] long cable		
Device fuse	16 A		
Ethernet connection	IP68		
Electrical equipment standard	EN 61010		
Protection class terminal box	IP42 EN 60529		
Material	Stainless steel 904L, others on request		
Protection tube for Sorbent Traps	Yes, screw-on		
Mounting flange	DN 65 PN 6 or 3", with camlock fitting		
Weight	Approx. 18 kg [≈ 39.7 lbs] for 2 m [≈ 6.6 ft] immersion depth		

Cooler Unit PSS-ST5-C

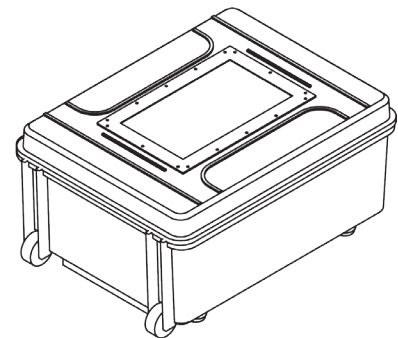
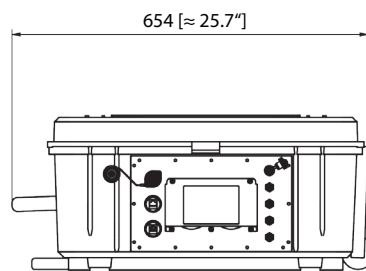
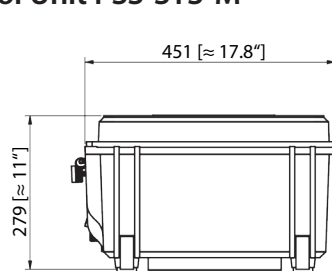


Dimensions in mm [Inches]

Technical Data

Portable Sampling System	Cooler Unit PSS-ST5-C
Part No. for 230 V AC	07A2200
Part No. for 115 V AC	07A2200a
Dew point gas OUT	Setting range: +2 to +15 °C [35.6 to 59 °F], factory setting: +5 °C [41 °F]
Dew point stability gas OUT	Under constant conditions < ± 0.1 °C [< ± 0.18 °F]
Temperature gas IN	*Max. +180 °C [356 °F] with stainless steel bulkhead fitting
Water vapor saturation gas IN	*Max. +80 °C [176 °F]
Ambient temperature	*+5 to +40 °C [41 to 104 °F]
Storage temperature	-25 to +65 °C [-13 to 149 °F]
Connection gas IN	Tube connection DN 4/6
Connection gas OUT	Tube connection DN 4/6
Connection condensate OUT	Tube connection DN 4/6
Material of wetted parts	Stainless steel 316 Ti, glass, PVDF, PTFE, Novopren
Ready for operation	After 3 min.
Power supply	115 or 230 V AC ±10 %, 50/60 Hz
Electrical connection	2 m [≈ 6.6 ft] long cable
Device fuse	10 A, time-delay, 5 x 20 mm
Power consumption	At 230 V: max. 1620 VA, 115 V: max. 920 VA
Electrical equipment standard	EN 61010
Protection class	IP42 EN 60529
Housing version	Portable impact-resistant plastic case with integrated trolley and pull-out handle
Housing color	Black
Dimensions (W x H x D)	451 x 654 x 279 mm [≈ 17.8" x 25.8" x 11.0"] with casters and handle
Weight	Approx. 16 kg [≈ 35.3 lbs]
Option: Shoulder straps (Part No. 90G0270)	Padded and adjustable shoulder straps made of robust polyester material for mounting on the cooler unit.

Control Unit PSS-ST5-M



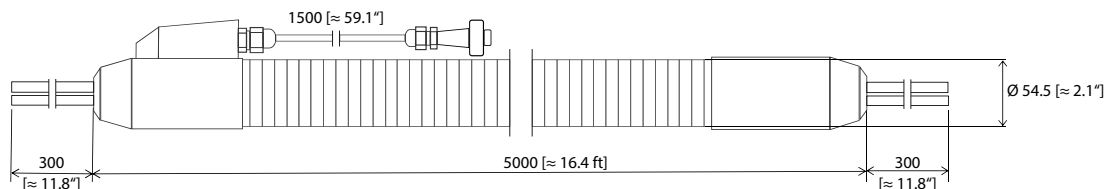
Dimensions in mm [Inches]

Technical Data

Portable Sampling System	Control Unit PSS-ST5-M
Part No.	07A2100
Ambient temperature	*+5 to +40 °C [41 to 104 °F]
Storage temperature	-25 to +65 °C [-13 to 149 °F]
Operating pressure	0.7 to 1.4 bar abs.
Number of connections gas IN	2
Number of connections gas OUT	2
Connection gas IN	Tube connection DN 4/6
Connection gas OUT	Tube connection DN 4/6
Material of wetted parts	SS 316 Ti, glass, PVDF, PTFE, Novopren
Ready for operation	After 30 min.
Power supply	115 or 230 V AC ±10 %, 50/60 Hz
Electrical connection	2 m [≈ 6.6 ft] long cable
Device fuse	4 A, time-delay, 5 x 20 mm
Electrical equipment standard	EN 61010
Protection class	IP42 EN 60529
Housing version	Portable impact-resistant plastic case with integrated trolley and pull-out handle
Housing color	Black
Dimensions (W x H x D)	451 x 654 x 279 mm [≈ 17.8" x 25.8" x 11.0"] with casters and handle
Weight	Approx. 16 kg [≈ 35.3 lbs]
Option: Shoulder straps (Part No. 90G0270)	Padded and adjustable shoulder straps made of robust polyester material for mounting on the control unit.

* Technical data with max. specifications are to be evaluated in consideration of the total cooling capacity at 25 °C [77 °F] and an outlet dew point of 5 °C [41 °F].

Gas Sample Line with 2 Inner Liners PSS-ST5-B



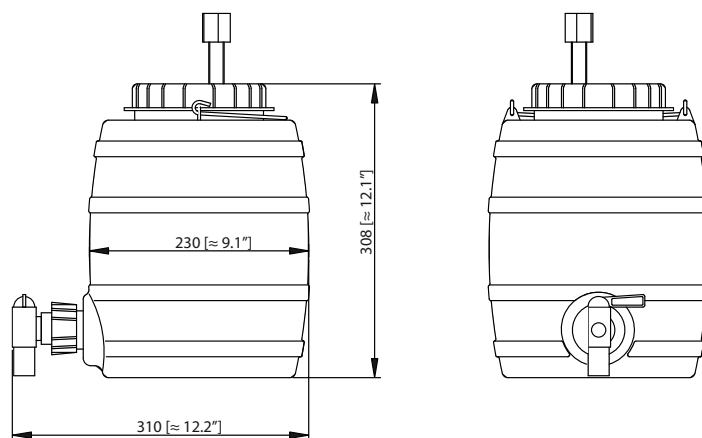
Dimensions in mm [Inches]

Technical Data

Portable Sampling System	Gas Sample Line with 2 Inner Liners PSS-ST5-B
Part No. for 230 V AC	07A2500
Part No. for 115 V AC	07A2500a
Power consumption with DN 4/6	85 W/m
Ambient temperature	-20 to +60 °C [- 4 to 140 °F]
Sample lines end caps	Type C (connection fitting) and type Y (end fitting) for 2 inner liners
Power supply	230 V AC or 115 V AC, supplied via control unit
Electrical connection	1.5 m [≈ 4.9 ft] cable with 7-pin connection for cooler unit
Temperatur sensor connection	Integrated in 7-pin connection for cooler unit
Electrical device standard	EN 61010
Length of sample line	*5 m [≈ 16.4 ft]
Inner liner	PTFE, DN 4/6, 2 replacable inner liners
Heating	+200 °C [392 °F]
Outer jacket	Corrugated polyamide tube, black
Application areas/smallest bending radius	Mobile and stationary, indoor and outdoor installation/320 mm [≈ 12.6"]
Weight	Approx. 5.6 kg [≈ 12.3 lbs]

* Other length on request, max. length at 230 V: 15 m, max. length at 115 V: 11 m

Condensate Vessel TK13/LA5 (optionally)

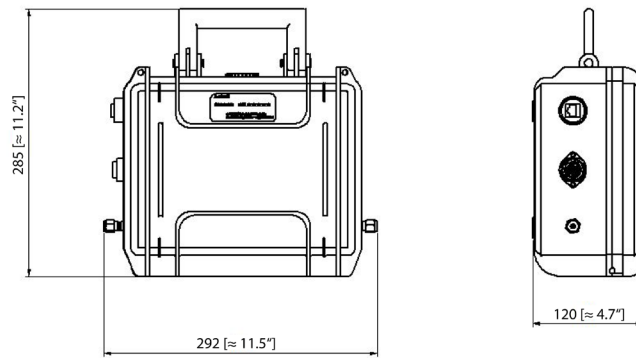


Dimensions in mm [Inches]

Technical Data

Portable Sampling System	Condensate Vessel TK13/LA5 (optionally)
Part No.	09K4320
Operating pressure at 20 °C [68 °F]	Atmospheric
Medium temperature	0 bis +50 °C [32 to 122 °F]
Ambient temperature	0 bis +55 °C [32 to 131 °F]
Storage temperature	-15 to + 65 °C [5 to 149 °F]
Connection condensate IN	2 x DN 4/6
Connection condensate OUT	Plug valve opening Ø 11.5 mm [≈ 0.5"]
Material of wetted parts	PE, rubber, PVDF
With filling level alarm	Yes, float switch
Switching capacity of the float switch	48 V 0.5 A 10 W
Dimensions (W x H x D)	230 (vessel diameter) x 308 x 310 mm (including plug valve opening) [≈ 9.1" x 12.1" x 12.2"]
Content	Approx. 10 l [≈ 2.2 gal]
Weight	Approx. 1 kg [≈ 2.2 lbs]

Audit MFC PSS-ST5-A (optionally)

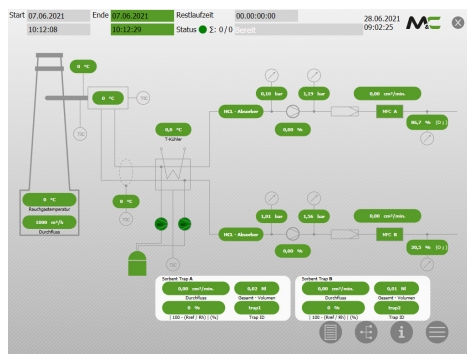


Dimensions in mm [Inches]

Technical Data

Portable Sampling System	Audit MFC PSS-ST5-A (optionally)
Part No.	072400
Gas flow	2 NI/h (at 2 bar abs.) to 87 NI/h
Operating pressure	2 to 8 bar abs.
Accuracy	Deviation < 1 %
Reproducibility	Deviation < 1 %
Power supply	115 V/230 V AC
Electrical connection	2 m [≈ 6.6 ft] long cable
Device fuse	4 A, time-delay, 5 x 20 mm
Electrical equipment standard	EN 61010
Protection class	IP42 EN 60529
Housing version	Portable impact-resistant plastic case with handle
Housing color	Black
Dimensions (W x H x D)	292 x 285 with handle x 120 mm [≈ 11.5" x 11.2" with handle x 4.7"]
Weight	Approx. 3 kg [≈ 6.6 lbs]

Please note: NI/h and NI/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.



"System overview" on the user interface of the control unit





Sorbent Traps

Sorbent Traps

for mercury measurements

Special Features

- **Short-term measurements up to 12 hours**
- **Long-term measurements up to 2 weeks**
- **Length of the short-term traps: approx. 180 mm [≈ 7.1"]**
- **Length of the long-term traps: approx. 400 mm [≈ 15.7"]**
- **Specification Traps for separate quantification of elemental and ionic mercury**

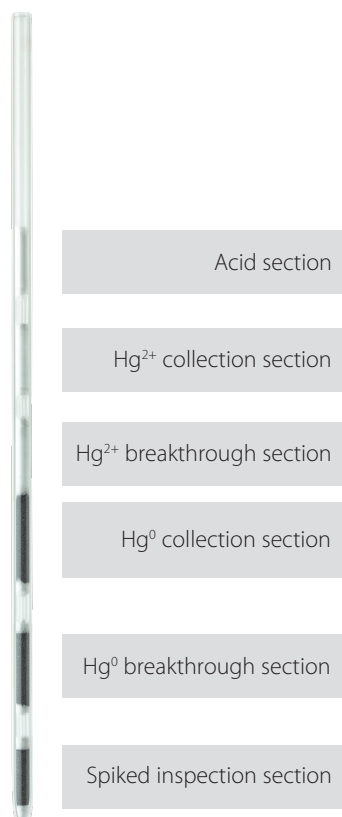
Application

The Sorbent Traps are used for mercury measurement according to DIN CEN/TS 17286:2019-07. In this mercury measurement, a defined volume flow is passed through two traps. The use of two Sorbent Traps in independent parallel gas paths ensures a high reliability of the measurement results. The traps are divided into up to six sections. The criteria which these sections must meet are defined in the relevant regulations. The analysis of the Sorbent Traps is carried out in the laboratory.



Typical applications are sampling of flue gases from combustion plants. Mercury measurement with Sorbent Traps is a very efficient tool for tests to separate mercury from flue gas.

Description



The M&C Sorbent Traps are part of M&C's PSS-ST5 portable sampling system which is used to determine the total mercury concentration in flue gases. Mercury detection limits as low as 10 ng/m³ can be achieved depending on sampling conditions, parameter settings and analytical method. The Sorbent Traps are inserted into the heated probe and removed according to a defined and programmed collection cycle.



Short-Term Traps for Measurements up to 12 Hours

Type	Description	Part No.
Trap Hg, short-term	 <ul style="list-style-type: none"> Trap for adsorption of Hg up to 12 hours in clean gas For a loading level of approx. 500 ng Hg at a flow rate of 30 NI/h sample gas* Dimensions (L x Ø): approx. 180 x 10 mm [≈ 7.1" x 0.4"] 	97A1010
Trap Hg, short-term, spiked inspection section	 <ul style="list-style-type: none"> Trap with spiked inspection section for adsorption of Hg up to 12 hours in clean gas Spiked inspection section with defined amount of Hg for recovery check in the laboratory (for regulatory authority measurements) For a loading level of approx. 500 ng Hg at a flow rate of 30 NI/h sample gas* Dimensions (L x Ø): approx. 180 x 10 mm [≈ 7.1" x 0.4"] 	97A1030



Long-Term Traps for Measurements up to 336 Hours

Type	Description	Part No.
Trap Hg, long-term	 <ul style="list-style-type: none"> Trap for adsorption of Hg up to 336 hours in clean gas For a loading level of approx. 2000 ng Hg at a flow rate of 30 NI/h sample gas* Dimensions (L x Ø): approx. 400 x 10 mm [≈ 15.7" x 0.4"] 	97A1110
Trap Hg, long-term, spiked inspection section	 <ul style="list-style-type: none"> Trap with spiked inspection section for adsorption of Hg up to 336 hours in clean gas Spiked inspection section with defined amount of Hg for recovery check in the laboratory (for regulatory authority measurements) For a loading level of approx. 2000 ng Hg at a flow rate of 30 NI/h sample gas* Dimensions (L x Ø): approx. 400 x 10 mm [≈ 15.7" x 0.4"] 	97A1130


* under ideal conditions

Please note: NI/h and NI/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.

Specification Traps

Type	Description	Part No.
Trap Hg, specification	 <ul style="list-style-type: none"> ■ Trap with acid section for adsorption of Hg up to 336 hours in clean gas ■ Separate quantification of elemental and ionic mercury ■ For a loading level of approx. 2000 ng Hg⁰ and 2000 ng Hg²⁺ at a flow rate of 30 NI/h sample gas* ■ Dimensions (L x Ø): approx. 400 x 10 mm [≈ 15.7" x 0.4"] 	97A1210
Trap Hg, specification, spiked inspection section	 <ul style="list-style-type: none"> ■ Trap with acid and spiked inspection section for adsorption of Hg up to 336 hours in clean gas ■ Separate quantification of elemental and ionic mercury ■ Spiked inspection section with defined amount of Hg for recovery check in the laboratory (for regulatory authority measurements) ■ For a loading level of approx. 2000 ng Hg⁰ and 2000 ng Hg²⁺ at a flow rate of 30 NI/h sample gas* ■ Dimensions (L x Ø): approx. 400 x 10 mm [≈ 15.7" x 0.4"] 	97A1220

Orientation Trap

Type	Description	Part No.
Trap Hg, orientation, spiked inspection section	 <ul style="list-style-type: none"> ■ Trap with acid and spiked inspection section for adsorption of Hg up to 4 hours ■ Spiked inspection section with defined amount of Hg for recovery check in the laboratory (for regulatory authority measurements) ■ For a loading level of approx. 2000 ng Hg_{total} at a flow rate of 30 NI/h sample gas* ■ Dimensions (L x Ø): approx. 180 x 10 mm [≈ 7.1" x 0.4"] 	97A1240

* under ideal conditions
Special traps on request

Please note: NI/h and NI/min refer to the German standard DIN 1343 and are based on these standard conditions: 0 °C [32 °F], 1013 mbar.