

Heated Probe **HP5**



dado lab



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Main characteristics

Heated sampling probe for the determination of particulate matter and chemicals in the gas phase. It's unique design, combined with the clamps-free slide and lock device, allows the probe to freely rotate around it's axis, needed for the swirl angle determination in accordance with the EN16911 and US EPA M1/2, while making it easy to move it with just two fingers.

Also, the probe can be fixed, in few seconds, to the hub in two different positions for common vertical stacks or for horizontal stacks, without the need of any further device.

- Built in accordance with the main international methods such as :
 - EN UNI 16911 velocity and flowrate in ducts
 - EN ISO 13284-1 particulate matter in low concentrations
 - EN ISO 1948-1 Dioxins/Furans and PCB
 - EN UNI 13211 Total Mercury
 - EN 14385 Heavy Metals
 - US EPA Method 1-2-5
- Modular assembling, rugged and easy to use
- Ready for swirl determination (digital inclinometer needed)
- Integrated type "S" Pitot tube
- Suitable also for horizontal ducts
- Heated cartridge sealed AISI 304 steel

Heated Probe for Micropollutants sampling

All the elements exposed to stack fumes are realized entirely AISI 316 stainless steel.

All the pneumatic and electronic connections are integrated in the compact single block structure.

The Pitot tube and thermocouple are integrated within the probe body, more rugged more easy to use on stacks.

With the HP5 it's possible to use internal suction tubes made in :

- Titanium GR2
- Borosilicate glass
- Quartz

Maximum operative temperature of 400°C
Pitot terminal not included

101 102 1001 HP5 Probe – Length 0.5 m

101 102 1002 HP5 Probe – Length 1.0 m

101 102 1003 HP5 Probe – Length 1.5 m

101 102 1004 HP5 Probe – Length 2.0 m

101 102 1005 HP5 Probe – Length 2.5 m

101 102 1006 HP5 Probe – Length 3.0 m



Samples Distribution Center

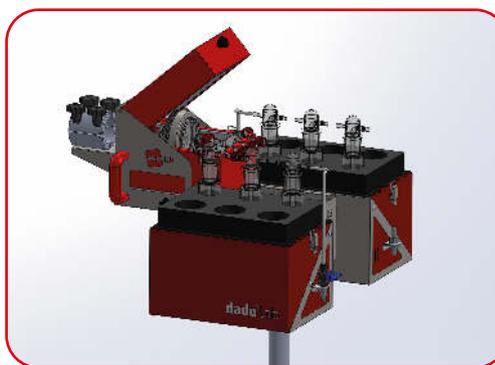
The HP5 is designed to be upgraded in relation to the application. Its modular design allows to add parts and devices to allow the sampling of different parameters simultaneously using only one probe.

A samples distribution center. One probe, many sampling ways! When only one stack port is available, those practical and functional solution greatly decrease the stack monitoring required time since the sample is simultaneously distributed to different equipment for collection or analysis.

Single or multiple derivations

Beside classic PM sampling, the probe can be equipped with single or multi-derivation device built in Titanium to capture all the chemical parameters in compliance to official methods, such as EN14385, EN13211, EN14791, EN1911, ISO 15713.

Practically, after filtration of the particulate matter, from main the gas stream is possible to extract from 1 up to 4 aliquots with lower flowrates (0,5 to 2 lt/min) sampled by constant flow pumps and sent to impinger train/s in order to capture the chemicals.



If multiple derivations are necessary, a special 4DL Hub is required to allocate filterholder and the 4DL device.

To the 4DL Hub is possible to mount a support which enables the positioning of two athermal boxes for a maximum of 4 impingers trains.



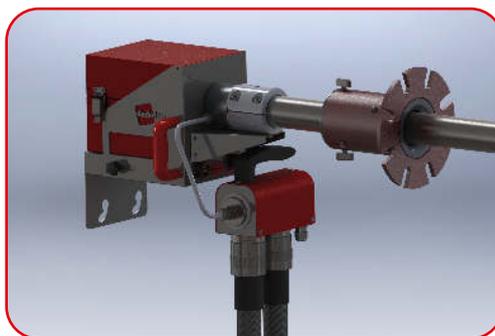
Separated Gas Sampling Line

The HP5 sampling probe can be equipped with a second internal sampling line dedicated to gas sampling. This practical solution allows to use the same isokinetic heated probe also to extract a gas using a secondary constant flow sampling line or real-time monitors such as FID, FTIR or combustion analyzers.

Just connect the sampling/monitoring equipment to the outlet of the gas line placed on the back of the probe.

For FID analyzers or Total VOCs sampling, dado lab designed a practical and light probe, named HP1, which filter housing, heated up to 180°C, can be connected to the HP5 to condition the sample in compliance to the EN12619-2013 for VOCs analysis or sampling.

The HP1 filter housing is available with one or two outlets for heated lines allowing to connect two analyzers or two sampling lines. For more details about the HP1 probe, check datasheet 101.105_HP1.



HUB HP5

HUB HP5 is the “connecting” device for all the items composing the heated sampling probe. Inside the box, are placed the different filtering devices made of titanium, quartz or glass.

The Hub is built in AISI304 stainless steel and aluminum, with protection painting

The thick insulation allows to operate at temperatures of 150 - 180 °C

The locking system of the hub allows to place the probe/Pitot in vertical or horizontal position.

Moving the probe is easier and safe thanks to the two handlings easy.

101 102 1101 HUB for Heated Probe

101 102 1102 HUB 4DL for Heated Probe

101 102 1103 Support for two athermal boxes

Particulate Matter collection devices

Titanium, Glass or Quartz Filterholder for 47mm flat membranes or thimbles.

The filter membrane is placed inside the filterholder cassette which makes it very fast and practical to change. Geometry and wide tight surface decrease the risk of accidental filter breaking.

101 102 1401 Filterholder d. 47mm glass with n°1 titanium cassette

101 102 1402 Filterholder d. 47mm quartz with n°1 titanium cassette

Glass/Quartz Filterholder for 25x100mm thimbles

101 102 1403 Glass thimbleholder 25x100 mm

101 102 1404 Quartz thimbleholder 25x100 mm

Titanium filterholder for 47mm flat membranes. Completely made of Titanium gr.2. Connections are realized with joints equipped with 8mm PTFE nuts

101 102 1410 Titanium filterholder d. 47mm with n°1 titanium cassette and tools

Filterholders and devices for side stream methods

Titanium, Glass and Quartz 47 mm Filterholder with side stream option

Allow to extract an aliquot of sample inside in the heated box in compliance with international methods asking for one or more derivation of the main isokinetic stream Available in both glass and quartz.

101 102 1401 47mm glass filterholder with side stream with n°1 titanium cassette

101 102 1402 47mm quartz filterholder with side stream with n°1 titanium cassette

Side stream splitters to be used with Titanium filterholder

101 102 1413 1-way titanium derivation

Made of Gr.2 Titanium and with Ø 6mm PVDF fittings for derived line and 8mm for isokinetic line.

101 102 1414 4-ways titanium derivation with tk

Made of Gr.2 Titanium and with n°4 Ø 6mm PVDF fittings for derived line and Ø 8mm for isokinetic line. The 4DL derivation is also equipped with thermocouple to measure the derivation line temperature



Slide and lock device

With this device, moving the heated probes, even the longest, along the stack axis, isn't a problem anymore.

It smoothly moves on three rollers without friction but grants at the same time position stability and isolation from stack fumes.

Completely built in anodized aluminum, the overall weight is less than 1.5 kgs.

The fixing flange can turn on the probe axis, allowing to align the probe correctly independently from the holes of the stack port.

This device is compatible with stack ports from 4" to 5" (DN80, DN100 and DN125).

101 102 2401 Slide device with rollers

For long probes, especially if equipped with onboard condensation devices, Dado lab realizes a monorail with trolley which support the probe body allowing to work in safety conditions.

1101 102 1150 Slide device with rollers

Pitot Terminals

The type "S" Pitot terminal (Darcy) is entirely made of AISI 316 steel and equipped with double ring connections.

Every piece is marker with unique serial number for the identification and traceability of the certification.

The particular asymmetric shape is made with the purpose to easily identify the probe positioning respect the flue gas direction.

Every terminal is supplied with the report including the calibration constant.

On request, is possible to supply the Accredia certification .

101 102 2030 Terminal Pitot Type "S" - Out stack filter

To be used with filterholder placed in the heated box

101 102 2031 Adapters for filteholder and Pitot in stack

Needed to install filterholder instack and extension for Pitot.

101 102 2032 Terminale Pitot Type "S" - 2 stages impactor

To be used with multi-stage impactor

Digital Inclinometer

This option allows a fast and easy determination of the swirl angles — to be entered in the ST5 for the evaluation of the cyclonic flow.

This battery rechargeable device can be fixed to the hub with its support and lets your hand free to turn the probe for the 0 dP point.

101 110 3001 Digital Protractor for HP5 probe



Athermal Box for impingers

Allows the connect directly, and without tubing, the hot filterholder to the impinger train, as requested by EPA5 or by the most recent EN methods for the determination of micropollutants in flue gas emission.

The box is fixed directly to the Hub without using any screws or bolts.

It's built in AISI304 stainless steel and aluminum while the impinger cooling bath is made in polypropilene.

The cover is made to protect and insulate the box for a safe and practical transport back to the laboratory.

101 102 1201 Athermal Box for impingers

101 103 2001 Mousse and support for 500cc impingers



Spare parts

101 102 1411 Spare cassette d. 47mm

Compatible with all filterholders d.47mm

101 102 1412 Set of 10 pcs gaskets for 47mm filterholder

Compatible with all filterholders d.47mm

101 102 4002 Set of 10pcs 8mm PTFE nuts



Consumables*

110 101 1003 47mm GMA grade binderless glass fiber filters - 100 pcs

110 101 1010 47mm MG227 grade w/ binder glass fiber filters - 100 pcs

110 101 1013 47mm QMS grade binderless quartz fiber filters - 50 pcs

110 101 1019 47mm MK360 grade binderless quartz fiber filters - 25 pcs

110 101 1151 25x100 MK360 grade binderless quartz fiber thimbles - 25 pcs

110 101 1151 25x100 405 grade binderless glass fiber thimbles - 25 pcs

110 102 1003 Antistatic Plastic Capsule for 47mm filters transport



** other sampling media available, please contact your local distributor for the complete list 5*



Inner tubes and calibrated nozzles

The HP5 probe is designed to quickly replace the inner tube with others made of different material in order to be in compliance with the different standards for micropollutants sampling along with particulate matter.

Realized with a smaller diameter to decrease the deposition effect and increase the recovery in laboratory, the inner tubes are available in AISI316 steel, Titanium Grade 2, Quartz or Glass.

L (mts)	Titanium	AISI316 Steel	Glass	Quartz
0,5	101 102 2001	101 102 2021	101 102 2101	101 102 2201
1	101 102 2002	101 102 2022	101 102 2102	101 102 2202
1,5	101 102 2003	101 102 2023	101 102 2103	101 102 2203
2	101 102 2004	101 102 2024	101 102 2104	101 102 2204
2,5	101 102 2005	101 102 2025	101 102 2105	101 102 2025
3	101 102 2006	101 102 2026	101 102 2106	101 102 2026

Goosenecks :

01 102 2050 Gooseneck curve Ti gr2

01 102 2081 Gooseneck curve AISI316 Steel

Available nozzles to be installed on the gooseneck :

Nozzle ø	Titanium	AISI316 Steel	Glass	Quartz
4	101 102 2062	101 102 2082	101 102 2161	101 102 2261
5	101 102 2063	101 102 2083	101 102 2162	101 102 2262
6	101 102 2064	101 102 2084	101 102 2163	101 102 2263
7	101 102 2065	101 102 2085	101 102 2164	101 102 2264
8	101 102 2066	101 102 2086	101 102 2165	101 102 2265
9	101 102 2067	101 102 2087	101 102 2166	101 102 2266
10	101 102 2068	101 102 2088	101 102 2167	101 102 2267
11	101 102 2069	101 102 2089	101 102 2168	101 102 2268
12	101 102 2070	101 102 2090	101 102 2169	101 102 2269
14	101 102 2071	101 102 2091	--	--
15	101 102 2072	101 102 2092	--	--
16	101 102 2073	101 102 2093	--	--

101 102 2300 Union Tee d10 for glass/quartz tubes complete of 1 PTFE nuts

The HP5 can also be equipped with a secondary gas sampling line, including a protection filter on the inlet, for gases determination :

101 102 2011 Length 0.5 m

101 102 2012 Length 1.0 m

101 102 2013 Length 1.5 m

101 102 2014 Length 2.0 m

101 102 2016 Length 2.5 m

101 102 2017 Length 3.0 m



Condenser and Trap FC5 for PCDD/PCDF and PAH

The FC5 condenser is built in accordance with the requirements defined in the EN1948 for the "Filter/condenser" method and to EPA23 with the dedicated option to invert the cartridge with the water flask.

The trap is equipped with a glass support for the use of PUF or XAD2.

The device is extremely compact, the adsorbing trap allocated inside the cooling device, this allow an increased cooling capability, UV protection and damage protection.

The FC5 is supplied with a shock proof case.

Accessories

101.102.4005 PAH glass cartridge

Spare parts and Consumables

101.102.1301 FC5 condenser kit, including :

- condenser
- XAD2/PUF trap
- 1 liter flask
- Glass Connection and fitting
- Transport case

101.102.4001 XAD2/PUF Trap in glass

101.102.4002 1 liter bottle with GL45 cap

