

ANNEXURE – C TO TENDER BAP/CAP/2015-16/OT-10
SPECIFICATION FOR DUST SAMPLING KITS: US EPA Method 17, Rev. 01

Supply of US EPA method 17 sampling kit as per the following specification – 14 sets

Sl. No.	Description	Vendor's confirmation	Remarks, if any
01	The kit shall meet the requirement of US EPA method 17 for flue gas particle sampling.		
02	The kit shall consist of the following accessories:		
02.1	<p>S – type Pitot.</p> <p>i. S – type Pitot shall be capable of taking measurement 3.5 m away.</p> <p>ii. The Pitot shall be made up of extension pieces with each piece measuring not more than 1.25 m.</p> <p>iii. In case multiple extension pieces can't be given, the Pitot extension piece shall be provided with threaded end connection. The type of thread shall be informed in the offer. The length of the Pitot in this case shall not exceed 1.25 m.</p> <p>iv. For price comparison of such offers, BHEL would load the cost of the extension pieces required to make the total length to 3.5 m.</p> <p>v. The assembly shall be provided with a box to house the entire assembly with locking arrangement (For easy transportation).</p>		
02.2	Digital manometer for measuring dynamic head using the above pitot tube.		
02.3	Sampling kit with flow meter (shall have precision of +/- 2 % with resolution of 0.01 Liters per minute).		
03	Dry gas meter shall have precision of +/- 2% with measurement from 0.02 to 2.5 Cu. M per hour.		
04	Timer for noting down the sampling time with reset feature.		
05	Vacuum pump shall be of capacity 6 Cu. m3 per hr.		
06	The kit shall be suitable for sampling flue gas from 40 to 400 Deg. C. Adequate cooler, dryer and condensate separator to be provided.		
07	<p>Sampling probe.</p> <p>i. The probe shall be capable of taking measurement 3.5 m away.</p> <p>ii. The probe shall be made up of extension pieces with each piece measuring not more than 1.25 m.</p> <p>iii. In case multiple extension pieces can't be given, the probe extension piece shall be provided with threaded end connection. The type of thread shall be informed in the offer. The length of the probe in this case shall not exceed 1.25 m.</p> <p>iv. For price comparison of such offers, BHEL would load the cost of the extension pieces required to make the total length to 3.5 m.</p> <p>v. The assembly shall be provided with a box to house the entire assembly with locking arrangement (For easy transportation).</p>		

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08	The Kit shall have provision for measuring the wet and dry gas sucked, gas meter and case temperature readings.		
09	The temperature sensors shall be of K type thermocouple with range 1- 800 Deg. C.		
10	The kit shall have the facility to simultaneously measure velocity and conduct iso kinetic sampling using pitot and probe. Indication for flow rate of sampled gas and pitot head should be available on the operator console/ control unit.		
11	Sampling and pitot hoses shall be suitable for high temperature flue gas sampling for the specified operating and ambient condition given in this specification. The length of hoses shall be of 20 meters. The hoses are required for the purpose of connection with console.		
12	The dust collector / thimble shall be designed for collecting 0.1 micron particles and shall withstand at least 400 Deg. C. The thimble shall withstand collection of dust up to 20 grams (net weight). The material of thimble shall be of Quartz fiber only.		
13	The thimble holder shall have nozzles from 5 mm to 12 mm. The set of nozzles shall be placed in the accessories box.		
14	Separate accessories box with glass jars for keeping thimble (10 nos. per box), necessary tools for the kit assembly, spanners etc., shall be provided with ease of transportation.		
15	The dimension and weight details of the kit shall be furnished during offer stage.		
16	The pitot, probe and housing boxes shall be of made of rust proof material		
17	The kit shall be suitable for the following ambient and operating conditions:		
17.1	<u>Ambient:</u> <ul style="list-style-type: none"> • Ambient temperature : 6 to 50 deg. C • Humidity : 95% at 50 Deg. C • Environment : the atmosphere will be very dusty. The units shall be suitably designed for such environment. 		
17.2	<u>Operating conditions:</u> <ul style="list-style-type: none"> • Flue gas temperature : 40 – 400 Deg. C • Static pressure : +50 to – 500 mm WC. • Velocity : 1 - 40 m / Sec., • Dust concentration : 100 gm / Nm3 at inlet 5 mgm / Nm3 at outlet. • Sampling duct size : 4 m X 4 m maximum • Sampling test pocket size : 80 mm opening. 		
18	Power supply: The operating power supply shall be suitable for 230 V +/- 10 %, AC, 50 Hz. If kit available for universal power supply, offer for the same shall also be furnished in the offer stage separately.		

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Bill of quantities:

Sl no.	Description	Quantity	Quoted (Yes / No)	Price
01.	Sampling kit complete for US EPA method 17	14 sets		
02.a	Suitable Pitot of maximum length 1.25 m with end threads.	14 sets		
02.b	Pitot assembly for measurement up to 3.5 meter by adding extensions to the main pitot as in sl. No. 02.a above housed in a box. (Each Pitot shall not have a length of more than 1.25 m)	14 sets		
03.a	Suitable Probe of maximum length 1.25 m with end threads.	14 sets		
03.b	Probe assembly for measurement up to 3.5 meter by adding extensions to the main pitot as in sl. No. 03.a above housed in a box. (Each Probe shall not have a length of more than 1.25 m)	14 sets		
04.	Vacuum pump housed in a metallic box with lock if not forming part of serial no. 01.	14 sets		
05.	Quartz fiber thimble	3000 nos.		
06.	Pitot hose of 20 m length	14 sets		
07.	Probe hose of 20 m length	14 sets		
08.	Accessories box with all tools required for conducting the sampling and assembling of kits.	14sets		
09.	Box suitable for preserving 10 thimbles along with glass jars (10 glass jars in each box). The jars shall be suitable for keeping in oven at 200 Deg C. The dimension of the jars shall be suitable for the thimbles used.	14 boxes		
10.	Carrying metallic case for ease of transportation of all items	14sets.		
11.	Operating manual with detailed calculations for all the conditions	6 sets & 1 set in CDROM.		
12.	Hand held digital temperature indicator suitable for K type thermocouple	14 sets		
13	*Spares for 3 years trouble free operation. (Indicate the split up price with part number separately)	As per annexure I		
14	Training / Demonstration: Vendor shall demonstrate the working principle, calculations, and presentations and carry out one full pledged test at one of the working plant after supply of equipment.			

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The above bill of quantities is indicative and minimum requirement. If any additional items are required for particulate sampling, same shall be supplied without any additional cost.

Break up for each item in the bill of quantity shall be furnished.

*Spares requirement: The minimum spares required for 3 years trouble free operation shall be supplied along with the main equipment.

Annexure I

Procurement of dust sampling kits method USEPA17 – 14 sets.

Spares requirement for 3 years operation

Sl.no	Item	Qty.
1.	Dry gas meters with adopter	6 sets
2.	Fitting for hoses (Clamps for tight fit)	10 sets
3.	Temperature indicator	6 nos.
4.	Thermocouples	6 sets
5	Valves for adjusting flow	6 sets
6	Vacuum pumps completed assembly	6 sets
7.	Pump oil	1000 ml

If any other spare required than the above, specify with quantity.