THERMO ENVIRONMENTAL INSTRUMENTS

Manufacturer of Air Pollution Monitoring Instruments

(ISO 9001:2015 CERTIFIED)

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INTRODUCTION

`Thermo Environmental Instruments' is a manufacturer and preferred supplier for all kind of Environmental Pollution Monitoring Instruments. We are a team of technically competent personnel having more than 30 years of experience in this field of manufacturing of pollution monitoring instruments, maintenance and calibration.

Ours is a standard proprietary instrument. Instruments are produced under direct supervision of team competent engineers and is individually tested and calibrated (with traceability to National Standards) for its quality, reliability and trouble fee operation.

We give prompt after sales service and quick response to suggestions from our users. Training facilities are also provided free of cost, at our works New Delhi. We offer one year warranty against any manufacturing defects and trouble free operation for our instruments.

PRODUCT RANGE INCLUDES

- **FINE PARTICULATE (PM 2.5) SAMPLER**
- **RESPIRABLE DUST (PM 10) SAMPLER**
- **HIGH VOLUME SAMPLER (FOR TSPM)**
- **GASEOUS SAMPLING ATTACHMENT**
- **THERMO ELECTRIC GASEOUS SAMPLING ATTACHMENT**
- **COMBINED SAMPLER FOR PM10, PM 2.5 & GASEOUS SAMPLER (SIMULTANEOUS MONITORING)**
- **LOW VOLUME COMBINED SAMPLER (SIMULTANEOUS MONITORING FOR PM10, PM 2.5 & GASEOUS)**
- **MINI VOLUME SAMPLER (BATTERY OPERATED)**
  (IT IS A PORTABLE AIR SAMPLER TO COLLECT PM 10, PM 2.5 AND TSPM PARTICLES. AT A TIME ANY TWO SAMPLING CAN BE POSSIBLE)
- **STACK MONITORING KIT (AS PER CPCB GUIDELINES)**
- **DIOXINS & FURANS MONITORING KIT (AS PER DESIGN EPA-23)**
- **VELOCITY MONITOR**
- **HANDY SAMPLER (BATTERY / AC OPERATED) (FOR TOTAL DUST & 3 GASES LIKE SO2/NOX/O3 & VOC)**
- **PERSONAL SAMPLER (OCCUPATIONAL HYGIENE) (BATTERY OPERATED)**
- **VOC/BENZENE SAMPLER (BATTERY OPERATED)**
- **TCLP ROTATRY AGITATOR (FOR SOLIDS AND WASTES - TOXICITY CHARACTERISTIC LEACHING PROCEDURE)**

We Care Environment -Thermo Environmental Instruments

LITERATURE OF RESPIRABLE DUST (PM 10) SAMPLER THERMO TEI-108 BL

(As recommended in BIS IS 5182-Part 23:2006)

The Respirable Dust Sampler was introduced by THERMO. Today the company produces several models of Respirable Dust Sampler Model TEI-108BL, 108NL & 108NLDF (with Digital Flow Indicator and Noiseless Blower) which formed the backbone of the National Ambient Air Monitoring Programme. Over the years, feedback has been received from a large body of users on difficulties encountered in the field and possible improvements that would enhance the performance of these systems with added user friendly features. The TEI-108BL incorporates these suggestions and provides a top of the line model for the discerning buyer who is not constrained by cost considerations and for those who will settle only for the best.

The Thermo TEI 108BL uses a brushless, continuous rated induction motor driven blower to significantly reduce equipment downtime, maintenance efforts and inconvenience to community. The brushless blower of this instrument also substantially reduces the audible noise. This model has been made more user-friendly by providing a lighting arrangement for night operation, tool box within the instrument, softer handles, and lockable top-cover. The cabinet design has been improved to prevent entry of rain water and dust into the machine.

PARTICULATE SAMPLING/SEPARATION: A cyclone is used for fractioning the dust into two fractions at D-50 cut off for 10 microns. Particles from 10 micron down to 0.1 micron are collected on Filter Paper placed on filter holder. Coarse particles (bigger than 10 microns) collected in a cup under the cyclone.

SPECIAL FLOW METER: Our Respirable Dust Samplers uses with a `Thermo Special Flow meter' instead of Glass Manometer. It is not required to fill water, in this system.

SPECIFICATIONS

Housing	Sturdy Aluminum cabinet to house Blower, Filter holder assembly, time totalizer, Programmable timer
Heavy Duty Blower	Blower, operated at 220V AC (+/-) 10V supply continuously for at least 28 hours
Flow Rate	0.8 – 1.5 m3/min free flow
Filter Holder	Aluminium casting with fine finished rubber gasket
Flow	**Thermo Special Flow meter / Rotameter, accurately directly in m3/min and measured across a critical orifice measurement**
Stabilizer	Voltage stabilizer provided to compensate voltage fluctuation
Power Requirement	Nominal 220 V, Single Phase, 50Hz AC mains supply.
Programmable timer	99.59 Hr.
Time Totalizer	9999.99 Hr.

This sampler RDS TEI 108 BL is essentially a particulate sampling system requiring a high flow rate. Gaseous sampling requires only a few LPM of air flow. All models of Respirable Dust Samplers are provided with a suction port and mounting hardware to facilitate interface of a Gaseous Sampling Attachment. Now two choices are available for Gaseous Sampling:-

- **Gaseous Sampling Attachment Thermo Model TEI -110**
- **Thermoelectric Gaseous Sampler Thermo Model TEI- 371**

Size & weight (approx.)	length (mm)	width(mm)	height(mm)	weight(kg) (net)
	420mm	330 mm	800 mm	40 Kg

Thermo Environmental Instruments

LITERATURE OF RESPIRABLE DUST (PM 10) SAMPLER THERMO TEI-108 NL

(As recommended in BIS IS 5182-Part 23:2006)

The Respirable Dust Sampler was introduced by THERMO. Today the company produces several models of Respirable Dust Sampler Model TEI-108BL, 108NL & 108NLDF (with Digital Flow Indicator and Noiseless Blower) which formed the backbone of the National Ambient Air Monitoring Programme. Over the years, feedback has been received from a large body of users on difficulties encountered in the field and possible improvements that would enhance the performance of these systems with added user friendly features. The TEI-108NL incorporates these suggestions and provides a top of the line model for the discerning buyer who is not constrained by cost considerations and for those who will settle only for the best.

Our customers indicated that high noise level is one main bottleneck to use existing models for monitoring ambient air quality around schools, hospitals, libraries, institutional areas, wild life sanctuaries and other noise sensitive areas. To meet this application specific requirement, we have, introduced a new model Thermo TEI-108NL which incorporates a noiseless brushless continuous duty rated induction motor driven blower. Thermo 108NL uses with Noiseless Blower. It is very silent while operating. Therefore, its operation does not cause any inconvenience to the community. It also has a negligible impact of voltage fluctuations and the flow rate is maintained reasonably stable. Additional advantage with this blower is very low variation in flow rate in 190-230V input power supply range and due to brushless motor, equipment downtime and maintenance efforts are also considerably reduced.

The TEI-108NL sample uses an improved cyclone (with sharper cutoff) to separate the coarser particles (>10 microns) from the air stream before filtering it on the 0.5 micron pore size filter allowing a measurement of both TSP and Respirable fraction of Suspended Particulate Matter (SPM).

SPECIAL FLOW METER: Our Respirable Dust Samplers uses with a `Thermo Special Flow meter' instead of Glass Manometer. In this system, it is not required to fill water.

SPECIFICATIONS

Housing	**Sturdy Aluminium cabinet to house Blower, Filter holder assembly, Time Totalizer, Programmable timer**
Heavy Duty Blower	**Blower, operated at 220V AC (+/-) 10V supply continuously for at least 28 hours**
Flow Rate	**0.8 – 1.5 m3/min free flow**
Filter Holder	**Aluminium casting with fine finished rubber gasket**
Flow	**Thermo Special Flow meter / Rotameter, accurately directly in m3/min and measured across a critical orifice measurement**
Programmable timer	**99.59 Hr.**
Time Totalizer	**9999.99 Hr.**

This sampler RDS TEI 108 NL is essentially a particulate sampling system requiring a high flow rate. Gaseous sampling requires only a few LPM of air flow. All models of Respirable Dust Samplers are provided with a suction port and mounting hardware to facilitate interface of a Gaseous Sampling Attachment. Now two choices are available for Gaseous Sampling:-

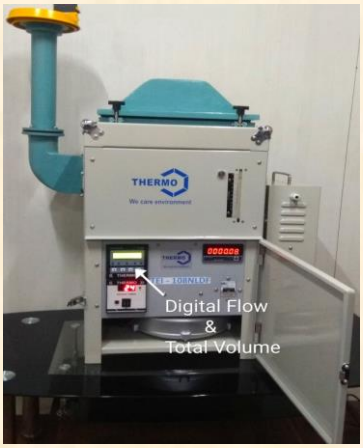
1. Gaseous Sampling Attachment Thermo Model TEI- 110
2. Thermoelectric Gaseous Sampler Thermo Model TEI -371

Size & weight (approx.)	Length (mm)	Width(mm)	Height(mm)	weight(kg) (net)
	420mm	330 mm	800 mm	40 Kg

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF RESPIRABLE DUST (PM 10) SAMPLER THERMO TEI-108 NLDF

(As recommended in BIS IS 5182-Part 23:2006)



The Respirable Dust Sampler was introduced by THERMO. Today the company produces several models Respirable Dust Sampler Model TEI-108BL & 108NL & 108NLDF (with Digital Flow Indicator and Noiseless Blower) which formed the backbone of the National Ambient Air Monitoring Programme. Over the years, feedback has been received from a large body of users on difficulties encountered in the field and possible improvements that would enhance the performance of these systems with added user friendly features. The TEI-108NLDF incorporates these suggestions and provides a top of the line model for the discerning buyer who is not constrained by cost considerations and for those who will settle only for the best.

DIGITAL FLOW INDICATOR

In all previous models of particulate samplers in use in the country, the sampling rate varies with dust loading on the filter and fluctuates with changes in the mains voltage. The TEI 108NLDF uses with a Digital Flow Indicator & Noiseless Blower. The size fractionating cyclone of the TEI-108NLDF thus operates close to its designed separation velocity resulting in a sharper cut-off for particulates larger than 10 microns. When the dust load on filter becomes excessive and exceeds the capacity of the blower.

Features:

- **Digital Flow Indicator & Total Volume**
- **No need to fill water**
- **After 24 Hrs. sampling, total volume shown display automatically in digital flow indicator**
- **It uses Noiseless Blower. It is very silent while operating. Therefore, its operation does not cause any inconvenience to the community. It also has a negligible impact of voltage fluctuations and the flow rate is maintained reasonably stable.**
- **Compact size easy to transportation**
- **Different type of handle fitted with the instrument for easy carrying**
- **Simple operating timer**

Specifications

Housing	Sturdy Aluminium cabinet to house Blower, Filter holder assembly, time totalizer, Programmable timer, Digital flow Indicator & Total Volume device
Heavy Duty Blower	Noiseless Blower, operated at 220V AC (+/-) 10V supply continuously for at least 28 hours
Flow Rate	0.8 – 1.5 m3/min free flow with Digital Flow Meter Device
Filter Holder	Aluminium casting with fine finished rubber gasket
Digital Flow indicator	**Thermo Special digital Flow meter, accurately directly in m3/min and measured across a critical orifice measurement. Digital Flow Meter Device show flow & Total Volume. After 24 hr. system will automatically be show total volume.**
Programmable timer	99.59 hr.
Time Totalizer	0 – 9999.99 hr.
Particulate SAMPLING/ SEPARATION	A cyclone is used for fractioning the dust into two fractions at D-50 cut off for 10 microns. Particles from 10 micron down to 0.1 micron are collected on Filter Paper placed on filter holder. Coarse particles (bigger than 10 microns) Collected in a cup under the cyclone

This sampler RDS TEI 108 NLDF is essentially a particulate sampling system requiring a high flow rate. Gaseous sampling requires only a few LPM of air flow. All models of Respirable Dust Sampler are provided with a suction port and mounting hardware to facilitate interface of a Gaseous Sampling Attachment. Now two choices are available for Gaseous Sampling:-

- **Gaseous Sampling Attachment Thermo Model TEI 110**
- **Thermoelectric Gaseous Sampler Thermo Model TEI 371**

Size & weight (approx)	length (mm)	width(mm)	height(mm)	weight(kg) (net)
	420mm	**330 mm**	**800 mm**	**40 Kg**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF HIGH VOLUME COMBINED SAMPLER - THERMO TEI 450-110

This sampler is suitable for PM 10, PM 2.5 & Gaseous monitoring

FEATURES

- **PM-10 AS PER BIS *IS 5182-Part 23:2006***
- **PM2.5 Impactor of sampler based on designs standardized by *USEPA.***
- **Single part cabinet Easy to transportation. Compact and portable for convenient field operation**
- **The TEI- 450 uses with Noiseless Blower & Oil free pump.**
- **This system can be used for PM10, PM2.5 & Gaseous sampling.**
- **PM -10 Sampling Flow rate of 0.8 – 1.5 m3/min free flow.**
- **PM -2.5 sampling flow rate of 1m3/hr. reduces filter choking even in areas having high FPM levels.**
- **Critical Orifice maintains constant sampling flow rate.**
- **Digital Flow & Totalized volume**
- **Distance between PM 10 & PM 2.5 inlet 1 meter**

Thermo TEI-450 is fitted with one of the best Noiseless Blower and Oil Free Pump of adequate capacities to generate needed sampling rates for PM10, PM2.5 streams and gaseous. Constant flow rates in both air streams are maintained throughout sampling duration with the help of critical orifices. Pump assembly is equipped with heavy duty induction motor which ensures that sampling rate is not affected due to input voltage fluctuations.

PARTICULATE SAMPLING/SEPARATION PM-10 - A cyclone is used for fractioning the dust into two fractions at D-50 cut off for 10 microns. Particles from 10 micron down to 0.1 micron are collected on Filter Paper placed on filter holder. Coarse particles (bigger than 10 microns) collected in a cup under the cyclone.

Flow meter / Rota meter, accurately directly in m3/min and measured across a critical orifice measurement

THERMO SPECIAL FLOW METER: Our Respirable Dust Samplers uses with a `Thermo Special Flow meter' instead of Glass Manometer. In this system, it is not required to fill water.

PARTICULATE SAMPLING/SEPARATION PM-2.5- TEI-450 system is a manual method for sampling fine particles (PM2.5 fraction) and is based on Impactor designs standardized by USEPA for ambient air quality monitoring. Ambient air enters the TEI-450 system through an omni-directional inlet designed to provide a clean aerodynamic cut -point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM2.5 impactor are passed through a 47mm diameter Teflon filter

membrane that retains the FPM For sampling of 2.5 micron dust two stage impactor based on the USEPA standard designs have been incorporated in TEI- 450. This impactor removes dust greater than 2.5 microns from ambient air in two stages(first in Pm10 impactor and second in WINS impactor fitted in series) Air is sucked through it at constant flow rate of 1.0 m^3/hr.

GASEOUS SAMPLING ATTACHMENT THERMO TEI–110

It used as gaseous attachment. Here the air is passed through suitable reagent that would absorb specific gases where gaseous pollutant like SO_2, NO_x, HF, CL_2, H_2S, NH_3, etc., are analyzed subsequently by simple wet chemistry method to determine the concentration of specific gaseous pollutant.

Is essentially a particulate sampling system requiring a high flow rate. Gaseous sampling requires only a few LPM of air flow.

TECHNICAL SPECIFICATIONS:

Flow Rate	PM10 : 0.8 – 1.5 m3/min free flow (Constant Flow Maintained with the help of critical orifices) PM2.5 :16.67 lpm(Constant Flow Maintained with the help of critical orifices)			
Particle Size	Particles of 10 microns and below collected on standard glass micro fiber filter paper of 8" x 10" diameter fitted below single stage impactor. While particles of 2.5 microns are collected in a separate 46.2 mm diameter PTFE membrane filter fitted at the bottom of WINS impactor of two stage impactor.			
PM10 impactor	As Per recommended in BIS IS 5182-Part 23:2006			
PM2.5 Impactor	Two stage as per USEPA Published Designs (Federal Register 40 CFR Part50)			
Gaseous Attachment:	For SOx, NOx, Ammonia, Ozone and others. Gaseous (4 any Gas) with Manifold and 3 LPM Rotameter			
Flow Rate	0-3 LPM measured using plastic body flow meter with 2% FSD accuracy			
Sampling Train	Five inlet and one outlet manifold with built in Needle Valves for flow control of each inlet			
Absorbers	4 Nos. of 35 ml Borosilicate glass impingers			
List of Components	Rotameter, Gas Manifold, Set of 4 impingers, ICE Tray, Portable Cabinet			
Time Totalizer	9999.99 Hr.			
Programmable timer	99-59.hr			
Operation	Blower & Pump operated at 220V AC (+/-) 10V supply continuously for at least 28 hours			
Cabinet	One part modular, corrosion free & easy to transport			
Size & weight (Approx.)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
Instrument box of PM10/PM2. 5	**420**	**330**	**800**	**45 Kg**
Gaseous Attachment	**245**	**130**	**380**	**03 Kg.**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF HIGH VOLUME (TSPM) SAMPLER THERMO TEI-301

(FOR TSPM - AS PER DESIGN IS – 5182 - PART 23)

HIGH VOLUME SAMPLER is a basic instruments used to monitor Ambient Air Quality. They are in widespread and use all over the world to Measure air pollution in industrial areas, Urban areas, on the shop floor, near Monuments and other sensitive areas. In these samplers, air borne suspended particulate (SPM) are measured by passing air at high Flow rate through a high efficiency filter Paper which retains the particles and Provisions have been made for simultaneous sampling of gaseous Pollutants also.

TEI-301: It is having a continuous duty blower with brushless motor which has replaced the conventional high speed blower where carbon brushes are required to be replaced at regular intervals. Noise level has been reduced in comparison to earlier models fitted with blower. It is lighter, more compact, can be carried in a car dickey and is ideal for fiend use.

MAIN FEATURE

- **No need to keep track of Carbon Brushes.**
- **Eliminate running cost of Blower parts.**
- **Elimination of EMI & reduction in noise.**
- **Thermo Special Flow meter, accurately directly in m3/min and measured across a critical orifice measurement**
- **Light weight**

STANDARD FEATURE

- **Provision to perform gaseous sampling using Attachment**
  Gaseous Sampling Attachment Thermo Model TEI 110
  Thermoelectric Gaseous Sampler Thermo Model TEI 371
- **Anodized aluminum body & frame work to withstand weathering effects.**
- **Separation of gable roof from main bousing for easy transportation.**
- **99.59 hr. programmable timer.**

SPECIAL FLOW METER: Our high volume sampler uses with a `Thermo Special Flow meter' instead of Glass Manometer. In this system, it is not required to fill water.

TECHNICAL SPECIFICATION

Flow rate	0.6 to 1.5 Cu m/min. free flow without Resistance.			
Particle Size	Down to 1.6 micron depending upon filter Used. Filter holder designed to Accept any standard filter sheet of 8" x 10" (20.3 x 25.4 cm) size			
Blower	Continuous duty blower with brushless motor			
Recommended Filter	GF/A (8" x 10") for common use. EPM 2000 for special research or equivalent.			
Sampling Time Record	0 to 24 Hrs. time totalizer records the running time in hours			
Automatic Sampling	99.59 hours programmable timer to automatically cut off Instruments			
Power Requirements	220 Volts, 5 amps, single phase AC			
List of Components	Continues duty blower with Brushless Motor, Orifice Flow Rotameter meter, Time Totalizer, Programmable Timer, Instrument Cabinet, Filter Holder Assembly, Detachable Gable Roof, Set of Spares and tools			
Size & weight (approx)	**LENGTH (MM)**	**WIDTH(MM)**	**HEIGHT(MM)**	**WEIGHT(KG) (NET)**
	440	**440**	**820**	**25KG.**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF GASEOUS SAMPLING ATTACHMENT THERMO TEI-110

(FOR GASEOUS - AS PER DESIGN IS – 5182 & CPCB GUIDLINES)

GASEOUS SAMPLING ATTACHMENT THERMO TEI–110 is used as gaseous attachment with High Volume Sampler / Respirable Dust Sampler. Here the air is passed through suitable reagent that would absorb specific gases where gaseous pollutant like SO_2, NO_x, HF, CL_2, H_2S, NH_3, etc., are analyzed subsequently by simple wet chemistry method to determine the concentration of specific gaseous pollutant.

The High Volume Sampler / Respirable Dust Sampler are essentially a particulate sampling system requiring a high flow rate. Gaseous sampling requires only a few LPM of air flow. All models of Thermo High Volume Sampler / Respirable Dust Samplers are provided with a suction port and mounting hardware to facilitate interface of the Gaseous Sampling Attachment Thermo TEI-110. The advantages of this type of system are:

- Easy handling of impingers
- No heating up of absorbing solutions due to heat from the blower
- Provision of using ice or cold water bath around impingers for complete absorption of soluble gases and loss of the gasses can be avoided.
- Facility of taking the impingers tray directly to the laboratory for safer transit of glass parts

TECHNICAL SPECIFICATIONS

Flow Rate	**0-3 LPM measured using plastic body flow meter with 2% FSD accuracy**			
Sampling Train	**Five inlet and one outlet manifold with built in Needle Valves for flow control of each inlet**			
Absorbers	**4 Nos. of 35 ml Borosilicate glass impingers**			
List of Components	**Rotameter, Gas Manifold, Set of 4 impingers, ICE Tray, Portable Cabinet**			
Size & weight (approx)	**LENGTH (MM)**	**WIDTH(MM)**	**HEIGHT(MM)**	**WEIGHT(KG) (NET)**
	245	**130**	**380**	***3KG.***

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF THERMOELECTRIC GASEOUS ATTACHMENT THERMO MODEL TEI-371

MAIN FEATURES

- Provides 24 hour continuous cooling/heating.
- Non wearing thermoelectric (peltier system).
- Brings down temperature by 10-25deg C depending upon the ambient conditions
- Helps in maintaining temperature during transportation.
- Portable and low power consumption.
- Full polyurethane-foam lining

In Respirable Dust Sampler or High Volume Sampler provision has been made for simultaneous sampling of gaseous pollutants. Here the air is passed through suitable reagents that would absorb specific gases where gaseous pollutant likes SO_2, NO_x, CL_2, H_2, S, CS_2, and NH3. Etc. are analysed subsequently by simple wet chemistry method to determine the concentration of specific pollutant.

Due to high ambient temperature it is necessary to cool down the reagents for high absorption efficiency. In a conventional attachment ice is normally used in order to cool down the temperature. During Gaseous sampling it often happens that ice does not last for full sampling period. As a result temperature of chemical reagents increases and it reduces absorption efficiency of gaseous pollutant. During high temperature even chemical reagents taken for absorption evaporates with time. New gaseous attachment Thermoelectric Gaseous Sampler Thermo Model TEI 371 has been designed to take care of such problems. It is provided with non-wearing thermoelectric / peltier system.

An efficient box with polyurethane foam lining provides necessary insulation. The attachment can be used for heating also. It is very useful during monitoring over high altitudes/low temperature areas because absorption efficiency decreases even at very low temperature also.

TECHNICAL SPECIFICATIONS

Flow Rate	0 - 3 LPM measured using plastic body flow meter(2% FSD accuracy)			
Power Consumption	48 watts			
Sampling Train	Four inlet and one outlet manifold with built in Needle Valves for flow control of each in let			
Absorbers	Glass Impinger 35ml (Borosilicate) 4 Nos.			
Power Input	Ac-220 volt /12 volt DC power			
Size & weight (approx.)	LENGTH (MM)	WIDTH(MM)	HEIGHT(MM)	WEIGHT(KG) (NET)
	320	340	450	9 Kg.

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF THERMO ELECTRIC GASEOUS POLLUTANT SAMPLER THERMO MODEL TEI – 372

The Thermo Electric Gaseous Pollutant Sampler Model TEI - 372 has been designed for monitoring Gaseous Pollutants like SO_2, NO_2, Cl_2, H_2S, O_3 , NH_3 etc. in ambient air. Sampled air is bubbled through suitable reagents that absorb specific gaseous pollutants and the absorbing media analyzed as per standard wet chemical methods. This Attachment TEI-372 commonly used with HVS/RDS. An independent stand alone monitoring instrument. We shall provide Suction Pump along with Time Totalizer & Timer separately, so that, it can be used / attached with both RDS/HVS also.

MAIN FEATURES

- **NO ICE required to keep Impingers Cool**
- **Provides 24 hour continuous cooling/heating.**
- **Non wearing thermoelectric (peltier system).**
- **Brings down temperature by 10-25deg C depending upon the ambient conditions**
- **Helps in maintaining temperature during transportation.**
- **Portable and low power consumption.**
- **Full polyurethane-foam lining**

We have especially designed the cooling system to provide effective cooling at the point of use via a cold-plate that surrounds the bottom portion of each Impinger. The TEI-372 is thus able to attain desired temperature within a few minutes of switching–on the system. The Thermo Model TEI-372 uses Peltier effect solid-state heat pump units having no moving parts, to keep the impingers upto 25°C below ambient temperature. This means that even in peak summer when outdoor temperature goes above 40oC, Impingers placed in the TEI-372 will remain at 15°C. A built-in thermostat constantly monitors the cold box temperature and ensures that absorbing solution is maintained within +/- 2°C of the set point.

For sampling of NOx and other sparsely soluble gases fritted bubbler is required to improve the absorption efficiency. The pump used in the TEI-372 has enough suction pressure to draw air through fritted disc. Thus NOx and HCHO sampling is possible in the system as per standard method requirements. Since ambient dust tends to block the fritted disc which is difficult to clean, it is recommended to attach a glass microfiber filter at the inlet of these impingers so that dust free air enters the system. Two 25mm dia filter holders are supplied with the sampler for this purpose. A special Amber Glass Impinger for Ozone is also available at a nominal extra cost for monitoring Ozone.

TECHNICAL SPECIFICATIONS

Absorbers Provided	4 Nos. of 35ml borosilicate glass impingers as per BIS 5182 (Part 6) 2006			
Sampling Rate of each Impinger	0.3 - 2.0 LPM measured using acrylic body Rotameter			
Sampling Train	Manifold having Four inlets and one out let manifold with built in needle valves for flow control of each inlet			
Sampling Time	28 hours (maximum)			
Sampling Time Record	0 to 9999.99 Hrs.			
Automatic Timer	99 hr. programmable timer to automatically shut off the System.			
Power Requirement	Nominal 220v, single phase 50 Hz AC, watts.			
Size & weight (approx.)	*LENGTH (MM)*	*WIDTH(MM)*	*HEIGHT(MM)*	*WEIGHT(KG) (NET)*
Thermo Electric Attachment	*340*	*340*	*450*	*8.65 Kg.*
Thermo Electric Suction Pump	*170*	*170*	*165*	*1.8 Kg.*

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF FINE PARTICULATE (PM 2.5) SAMPLER THERMO TEI-121

(for PM 2.5 As Per DESIGN EPA – CFR 40 PART 50 APPENDIX- L)

The FINE PARTICULATE PM 2.5 SAMPLER THERMO MODEL TEI-121 systems is a manual method for sampling Fine Particles (PM2.5 fraction) and is based on impactor designs standardized by USEPA for ambient air quality monitoring. Ambient air enters the TEI -121 systems through an Omni-directional inlet designed to provide a clean aerodynamic cut -point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM2.5 impactor are passed through a 47mm diameter Teflon filter membrane that retains the FPM.

THERMO TEI -121 system allows removal of the PM2.5 impactor from the sample stream so that the same system may be optionally used as a PM10 Sampler.

The TEI 121 system has benefited in producing reliable systems for measurement of Air Pollution. The sampling rate of the system is held constant at 1m3/hr by a suitable Rotameter. By locating all power dissipating components in a separate cabinet, TEI 121 ensures that the temperature of the PM 2.5 filters remains close to ambient temperature and there is no chance of losing volatile fractions of the PM 2.5. The system uses a continuous rated, oil free pump for providing suction pressure. The standard system is supplied with a Dry Gas Meter to provide a direct measure of the total air volume sampled.

FEATURES

- **PM2.5 Impactor of sampler based on designs standardized by USEPA.**
- **Single part cabinet.**
- **The TEI - 121 uses a brushless pump with a low noise.**
- **Same instrument can be used for PM10 and PM2.5 sampling.**
- **Lower sampling rate of 1m3/hr. reduces filter choking even in areas having high FPM levels.**
- **Rotameter maintains constant sampling rate of 16.67 LPM**
- **Compact and portable for convenient field operation.**

SPECIFICATIONS:

Particle Size	Omni-directional air inlet with PM 10 separation through an impactor followed by PM 2.5 separation through a WINS Impactor			
Sampling rate	Constant sampling rate of 1m3/hr. unaffected by voltage fluctuation and filter choking maintained by Rotameter system.			
Filter Media	Filter holder designed to accept any standard 47 mm diameter filter media			
Sample Volume	Dry Gas meter records the total air volume sampled			
Power Requirement	Single phase AC 220 Volts, 50 Hertz supply. Sampler unaffected by +/-10% fluctuation in supply voltage			
Size & weight (approx)	*LENGTH (MM)*	*WIDTH(MM)*	*HEIGHT(MM)*	*WEIGHT(KG) (NET)*
	400	*320*	*530*	*20 kG.*

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF FINE PERTICULATE (PM 2.5) SAMPLER THERMO TEI-121 DFM (with Digital Flow Meter)

(for PM 2.5 As Per DESIGN EPA – CFR 40 PART 50 APPENDIX- L)

Studies sponsored by USEPA have concluded that Fine Particles (PM2.5) which penetrate deep into the lungs are more likely to contribute to health effects. Fine Particulate Matter (FPM) also adversely affects visibility. In keeping with THERMO's tradition of anticipating the need and pioneering development of suitable indigenous Instruments the TEI 121DFM (with Digital Flow Meter) Fine Particle Sampler was developed by us in 2016. PM 2.5 has been included in the National Air Quality standard in November 2009. Many units in active use all over the country the TEI 121 is a field proven system.

TEI 121DFM system is a manual method for sampling fine particles (PM2.5 fraction) and is based on Impactor designs standardized by USEPA for ambient air quality monitoring. Ambient air enters the TEI 121DFM system through an omni-directional inlet designed to provide a clean aerodynamic cut -point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM2.5 impactor are passed through a 47mm diameter Teflon filter membrane that retains the FPM.

THERMO TEI 121DFM system allows removal of the PM2.5 impactor from the sample stream so that the same system may be optionally used as a PM10 Sampler.

The TEI – 121DFM system has benefited from THERMO's experience in producing reliable systems for measurement of Air Pollution. The sampling rate of the system is held constant at 1m3/hr. by a suitable critical orifice. By locating all power dissipating components in a single cabinet the TEI 121DFM ensures that the temperature of the PM 2.5 filter remains close to ambient temperature and there is no chance of losing volatile fractions of the PM 2.5. The system uses a continuous rated, oil free pump for providing suction pressure. The standard system is supplied with a Digital Display Meter to provide a direct measure of the total air volume sampled.

FEATURES

- **PM2.5 Impactor of sampler based on designs standardized by USEPA.**
- **Single part cabinet**
- **The TEI 121DFM uses with Oil free pump with a low noise.**
- **Same instrument can be used for PM10 and PM2.5 sampling.**
- **Lower sampling rate of 1m3/hr. reduces filter choking even in areas having high FPM levels.**
- **Critical Orifice maintains constant sampling rate of 1m3/hour.**
- **Compact and portable for convenient field operation.**
- **Digital Flow & Totalized volume**

SPECIFICATIONS:

Particle Size	Omni-directional air inlet with PM 10 separation through an impactor followed by PM 2.5 separation through a WINS Impactor			
Sampling rate	Constant sampling rate of 1m3/hr unaffected by voltage fluctuation and filter choking maintained by critical orifice system.			
Filter Media	Filter holder designed to accept any standard 47 mm diameter filter media			
Sample Volume	Digital display Meter records the total air volume sampled.			
Power Requirement	Single phase AC 220 Volts, 50 Hertz supply. Sampler unaffected by +/-10% fluctuation in supply voltage			
Size & weight (approx.)	*LENGTH (MM)*	WIDTH(MM)	HEIGHT(MM)	WEIGHT(KG) (NET)
	400	320	530	18 Kg.

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF FINE PERTICULATE (PM 2.5) SAMPLER THERMO TEI-121 MFC

(For PM 2.5 As Per DESIGN EPA – CFR 40 PART 50 APPENDIX- L)

Features

- **PM2.5 and PM 10 Impactor as per designs standardized by USEPA.**
- **Mass Flow based controller maintains constant Air Sampling rate of 16.7LPM.**
- **Data Recorded in USB Memory.**
- **In-built system to control start and stop times of sampler.**
- **Microcontroller based data logger records Air Temperature, Filter Temperature, Filter, Barometric Pressure, Flow Rate and Air Sample Volume.**
- **Data File compatible with MS Excel**
- **Oil free & Noise Less pump**
- **Timer & Hour Meter provided**

Studies sponsored by USEPA have concluded **that Fine Particles (PM2.5) which penetrate deep into the lungs are more likely to contribute to health effects. Fine Particulate Matter (FPM) also adversely affects visibility. In keeping with THERMO's tradition of anticipating the need and pioneering development of suitable indigenous Instruments the TEI 121 MFC Fine Particle Sampler was developed by us in 2016.**

This system is a manual method for sampling fine particles (PM2.5 fraction) and is based on Impactor designs standardized by USEPA for ambient air quality monitoring. Ambient air enters the TEI-121MFC system through an Omni-directional inlet designed to provide a clean aerodynamic cut -point for particles greater than 10 microns. Particles in the air stream finer than 10 microns proceed to a second impactor that has an aerodynamic cut point at 2.5 microns. The air sample and fine particulates exiting from the PM2.5 impactor are passed through a 47mm diameter Teflon filter membrane that retains the FPM.

THERMO TEI-121MFC system allows removal of the PM2.5 impactor from the sample stream so that the same system may be optionally used as a PM10 Sampler.

The sampling rate of the system is held constant at 1m3/hr. by a suitable critical orifice. By locating all power dissipating components in a single cabinet the TEI-121MFC ensures that the temperature of the

PM 2.5 filter remains close to ambient temperature and there is no chance of osing volatile fractions of the PM 2.5. The system uses a continuous rated, oil free pump for providing suction pressure. The standard system is supplied with a Digital Display Meter to provide a direct measure of the total air volume sampled.

Advanced features:

- All run time parameters such s Flow rate, Air Temperature, Filter Temperature, Barometric Pressure, Sample Volume etc. recorded in USB memory (PEN DRIVE).
- Summary of run time parameters provided at end of sample duration reducing the need to download recorded data.
- Data file format is compatible with MS EXCEL so that no addition software is required to view or process recorded data

Mass Flow rate sensor: The TEI-121MFC uses a Mass Flow Sensor to accurately measure air sample flow rate. The sampling rate is held constant at 1m3/hr by a microprocessor based electronic flow controller that automatically adjusts pump RPM with increasing pressure drop due to dust deposit on the filter. An ambient air temperature sensor and barometric pressure sensor have been provided to automatically provide temperature and pressure correction while reporting flow rate in volumetric flow units.

Data recorded in USB Flash Memory. The TEI-121MFC has an in-built USB Flash memory based data logger that records , air temperature, filter temperature, barometric pressure, flow rate, Coefficient of Variation (CV) and also totalizes and records the volume of air sampled.

The brushless, continuous rated induction motor driven suction pump of the TEI-121MFC causes no electromagnetic interference (EMI) in gadgets and is immune to voltage fluctuations. The instrument has been housed in a compact and sturdy powder coated Aluminum cabinet.

SPECIFICATIONS

- **Flow Rate: 1m3/hr maintained by Mass Flow controller.**
- **Elapsed time indicator: Real Time clock based, records the operating time for each sample in hours and minutes.**
- **Volumetric Flow rate Compensation: Performed automatically by the system using Sensors for Ambient Temperature and Barometric Pressure.**
- **Flow Recorder: USB flash memory based system records flow rate, volume of air sampled, air temperature, filter temperature and barometric pressure.**
- **Size selective inlets: PM10 Impactor and WINS Impactor for PM2.5 conform to USEPA design.**
- **Special Features: Auto shut-off of sampler if designed value of 16.7 LPM.**
- **Same inst. Can be used as a PM10 Sampler by removing the WINS impactor.**
- **Vacuum Pump: Oil free, pump driven by induction motor for stable flow rate.**
- **Data File compatible with MS EXCEL: Downloaded data directly opens in an Excel Sheet.**
- **Power Requirement: Single phase AC 220 Volts, 50 Hertz supply. Sampler unaffected by +/-10% Fluctuation in supply voltage**
- **Leak Check system provided**

Size & weight (approx.)	*LENGTH (MM)*	WIDTH(MM)	HEIGHT(MM)	WEIGHT(KG) (NET)
	400	320	530	18 Kg.

LITERATURE OF COMBINED SAMPLER THERMO TEI 451-110 (SIMULTANEOUS SAMPLER)

This sampler is suitable for PM 10, PM 2.5 & Gaseous monitoring simultaneously, all the parameter can be monitored at a time

Air quality standard notified by Govt. of India where measurement of PM10, PM2.5 Dust and Gaseous are required simultaneously with other pollutants to decide status of air pollution. So far samplers developed in India do not have provision for simultaneous sampling of PM10, PM2.5 dust and Gaseous. Thus three samplers need to be operated simultaneously to know concentration of these pollutants in ambient air. Thus measurements of these parameters become expensive and difficult as significant efforts are required in transportation and operation of three samplers at one place.

Thermo realizes these limitations and took lead to develop impactor based Combined Sampler for simultaneous sampling of PM10, PM2.5 dust and Gaseous using single instrument. Single stage impactor matching to European Union designs has been fitted in the Combo Sampler for PM10 measurement. This impactor removes dust greater than 10 microns from ambient air when sucked through it at constant flow rate of 1 m^3/hr.

For sampling of 2.5 micron dust two stage impactor based on the USEPA standard designs have been incorporated in TEI 451. This impactor removes dust greater than 2.5 microns from ambient air in two stages(first in Pm10 impactor and second in WINS impactor fitted in series) Air is sucked through it at constant flow rate of 1.0 m^3/hr.

Thermo TEI-451 is fitted with one of the best brushless and noiseless pumps of adequate capacities to generate needed sampling rates for PM10, PM2.5 streams and gaseous. Constant flow rates in both air streams are maintained throughout sampling duration with the help of critical orifices. Pump assembly is equipped with heavy duty induction motor which ensures that sampling rate is not affected due to input voltage fluctuations.

TEI 451 is equipped with two flow meter which continuously display sampling flow rates of two streams controlled by Rotameter.

Modular design of sampler, tubing and other fitments made this sampler simple easy to transport & operate can be used successfully in harsh Indian climatic conditions.

GASEOUS SAMPLING ATTACHMENT THERMO TEI–110

It used as gaseous attachment. Here the air is passed through suitable reagent that would absorb specific gases where gaseous pollutant like SO_2, NO_x, HF, CL_2, H_2, S, NH_3, etc., are analyzed subsequently by simple wet chemistry method to determine the concentration of specific gaseous pollutant.

Is essentially a particulate sampling system requiring a high flow rate. Gaseous sampling requires only a few LPM of air flow.

TECHNICAL SPECIFICATIONS:

Flow Rate	PM10 :16.67 lpm (Constant Flow Maintained with the help of Rotameter) PM2.5 :16.67 lpm(Constant Flow Maintained with the help of Rotameter			
Particle Size	Particles of 10 microns and below collected on standard glass micro fiber filter paper of 47mm diameter fitted below single stage impactor. While particles of 2.5 microns are collected in a separate 46.2 mm diameter PTFE membrane filter fitted at the bottom of WINS impactor of two stage impactor.			
PM10 impactor	Single stage matching to European Design (according to EN12341)			
PM2.5 Impactor	Two stage as per USEPA Published Designs (Federal Register 40 CFR Part50)			
Flow Record	Independent Flow Indicator for PM10 & PM2.5 streams to display air sampling flow rates passing through filters accurately			
Gaseous attachment	For SOx, NOx, Ammonia, Ozone and others. Gaseous (4 any Gas) with Manifold and 3 LPM Rotameter			
Time Totalizer	9999.99 Hr.			
Programmable timer	99-59.hr			
Operation	Pump operated at 220V AC (+/-) 10V supply continuously for at least 28 hours			
Cabinet	One part modular, corrosion free & easy to transport			
Size & weight (Approx.)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
Instrument box	**400**	**420**	**550**	**25 Kg**

THERMO ENVIRONMENTAL INSTRUMENTS

LOW VOLUME COMBINED SAMPLER TEI – 602G-110 (SIMULTANEOUS MONITORING FOR PM10, PM 2.5 & GASEOUS)
(BATTERY OPERATED) all the parameters can be monitored at a time

The Thermo Model LVCS TEI – 602G (Battery Operated) is a portable air sampler to collect PM10, PM2.5 Dust and Gaseous at a time.

After remove the Impactor, it can collect TSPM Particles also. In this case at a time any two Dust sampling like PM10 / PM2.5 / TSPM can be possible. This system designed by us, it is Portable, Light Weight & easy to carrying, less than 15 Kg.

LVCS TEI-602G samples ambient air at 5 LPM for Particulate Matter (PM10, PM2.5 and Gaseous). While not a reference method sampler, the LVCS TEI-602 gives results that closely approximate data from Federal Reference Method samplers. This system is ideal for remote areas or locations where no permanent electricity has been established. The battery can power the sampler for 24 Hrs. of continuous sampling.

TECHNICAL SPECIFICATIONS:

Flow Rate	PM10 : 5 lpm (Constant Flow Maintained with the help of flow controller) PM2.5 : 5 lpm(Constant Flow Maintained with the help of flow controller)			
Particle Size	Particles of 10 microns and below collected on standard glass micro fiber filter paper of 47mm diameter fitted below single stage impactor. While particles of 2.5 microns are collected in a separate 46.2 mm diameter PTFE membrane filter fitted at the bottom of WINS impactor of two stage impactor.			
Flow Record	Independent Flow Indicator for PM10 & PM2.5 streams to display air sampling flow rates passing through filters accurately			
Gaseous Attachment	For Sox, NOx, Ammonia, Ozone and others. Gaseous (4 any Gas) with Manifold and 3 LPM Rotameter			
Timer	Programmable timer 12 v DC			
Operation	Pump operated at 12v DC continuously for at least 24 hours			
Cabinet	One part modular, corrosion free & easy to transport			
Size & weight (Approx.)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
Instrument box	**325**	**280**	**405**	**15 Kg**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF MINI COMBINED SAMPLER THERMO TEI- 452-110
(SIMULTANEOUS SAMPLER)

This sampler is suitable for PM 10, PM 2.5 & Gaseous monitoring simultaneously, all the parameter can be monitored at a time

Air quality standard notified by Govt. of India where measurement of PM10, PM2.5 Dust and Gaseous are required simultaneously with other pollutants to decide status of air pollution. So far samplers developed in India do not have provision for simultaneous sampling of PM10, PM2.5 dust and Gaseous. Thus three samplers need to be operated simultaneously to know concentration of these pollutants in ambient air. Thus measurements of these parameters become expensive and difficult as significant efforts are required in transportation and operation of three samplers at one place.

`Thermo' realizes these limitations and took lead to develop impactor based Combined Sampler for simultaneous sampling of PM10, PM2.5 Dust and Gaseous using single instrument. Single stage impactor matching to European Union designs has been fitted in the Combo Sampler for PM10 measurement. This impactor removes dust greater than 10 microns from ambient air when sucked through it at constant flow rate of 1 m^3/hr.

For sampling of 2.5 micron dust two stage impactor based on the USEPA standard designs have been incorporated in Thermo Model TEI 452. This impactor removes dust greater than 2.5 microns from ambient air in two stages(first in PM10 impactor and second in WINS impactor fitted in series) Air is sucked through it at constant flow rate of 1.0 m^3/hr.

Thermo TEI - 452 is fitted with one of the best brushless and noiseless pumps of adequate capacities to generate needed sampling rates for PM10, PM2.5 streams and gaseous. Constant flow rates in both air streams are maintained throughout sampling duration with the help of critical orifices. Pump assembly is equipped with heavy duty induction motor which ensures that sampling rate is not affected due to input voltage fluctuations.

TEI 452 is equipped with two flow meter which continuously display sampling flow rates of two streams controlled by Rotameter.

Modular design of sampler, tubing and other fitments made this sampler simple easy to transport & operate can be used successfully in harsh Indian climatic conditions.

GASEOUS SAMPLING ATTACHMENT THERMO TEI–110

It used as gaseous attachment. Here the air is passed through suitable reagent that would absorb specific gases where gaseous pollutant like SO_2, NO_x, HF, CL_2, H_2, S, NH_3, etc., are analyzed subsequently by simple wet chemistry method to determine the concentration of specific gaseous pollutant.

Is essentially a particulate sampling system requiring a high flow rate. Gaseous sampling requires only a few LPM of air flow.

TECHNICAL SPECIFICATIONS:

Flow Rate	PM10 :16.67 lpm (Constant Flow Maintained with the help of Rotameter) PM2.5 :16.67 lpm(Constant Flow Maintained with the help of Rotameter			
Particle Size	Particles of 10 microns and below collected on standard glass micro fiber filter paper of 47mm diameter fitted below single stage impactor. While particles of 2.5 microns are collected in a separate 46.2 mm diameter PTFE membrane filter fitted at the bottom of WINS impactor of two stage impactor.			
PM10 impactor	Single stage matching to European Design (according to EN12341)			
PM2.5 Impactor	Two stage as per USEPA Published Designs (Federal Register 40 CFR Part50)			
Gaseous Attachment	For Sox, NOx, Ammonia, Ozone and others. Gaseous (4 any Gas) with Manifold and 3 LPM Rotameter			
Time Totalizer	9999.99 Hr.			
Programmable timer	99-59.hr			
Operation	Pump operated at 220V AC (+/-) 10V supply continuously for at least 28 hours			
Cabinet	One part modular, corrosion free & easy to transport			
Size & weight (Approx.)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
Instrument box	**400**	**325**	**325**	**20 Kg**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF MINI VOLUME (PM 10, PM 2.5 or TSPM) COMBINED SAMPLER THERMO TEI-602D

The Thermo Model MVCS TEI – 602 (Battery Operated) is a portable air sampler to collect PM 10 & PM 2.5 particles at a time. After remove the Impactor, it can collect TSPM Particles also. At a time any two sampling can be possible. This system designed by us, it is Portable, Light Weight & easy to carrying, less than 8.5 Kg.

MVCS TEI-602 samples ambient air at 5 LPM for Particulate Matter (PM10, PM2.5, and TSPM). While not a reference method sampler, the MVCS TEI-602 gives results that closely approximate data from Federal Reference Method samplers. This system is ideal for remote areas or locations where no permanent electricity has been established. The battery can power the sampler for 24 Hrs. of continuous sampling,

The TEI-602 features an elapsed time totalizer, operation from rechargeable batteries. The filter holder assembly can be configured for TSP, PM10 & PM2.5 sampling. For particulate sampling the MVCS uses 47mm filters to collect particulate matter. Filters should be weighed pre and post exposure with a microbalance accurate to one microgram/cubic meter. The Mini Volume Combined Sampler TEI-602 is a versatile platform that is attractive to end users. With a broad range of customers, the reliable and proven Mini Volume Combined Sampler system has made a place for itself in the air quality industry. Improving upon the best in portable air sampler, the MVCS leads the way for the next generation of innovative air sampling equipment.

FEATURES:

PORTABLE AND LIGHT WEIGHT: The compact sampler design weights less than 10kg when fully configured.

LOW MAINTENANCE: All sampler components were designer for maximum durability and minimal maintenance. Even the routine cleaning of the size selective inlets has been simplified with the design of the Easy Maintenance Target.

HIGH EFFICIENCY PUMP: MVCS TEI-602 introduces a Diaphragm Pump designed specifically for the TEI-602.

SAMPLING MEDIA: The MVCS utilizes standard USEPA FRM 47 capacities. A wide variety of fiber media is available for specific sampling applications.

POWER (OPTIONS): The MVCS functions via AC/DC or remote location sampling.

TRIPOD STAND: For better accessibility.

TECHNICAL SPECIFICATIONS:

Flow Range	0-10 LPM			
Sampling Flow rate	5 LPM			
Filter Media	Filter holder designed to accept any standard 47 mm diameter filter media			
Battery	11.1 V x 10400 mAh			
Battery Charger	Single phase AC 220 Volts, 50 Hertz supply. Sampler unaffected by +/-10% fluctuation in supply voltage for battery Charging			
Size & weight (Approx.)	*LENGTH (MM)*	*WIDTH(MM)*	*HEIGHT(MM)*	*WEIGHT(KG) (NET)*
	300	*255*	*255*	*8.5 Kg.*

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF STACK MONITORING KIT THERMO TEI- 401

(AS PER DESIGN IS-11255 (PART- 3) & AS PER CPCB GUIDELINES)

INTRODUCTION

The most common and widely used method (world over) is extractive sample method or Grab sampling technique. Grab sampling technique is also often treated as the reference standard method. Grab sampling technique is not restricted to a specific pollutant. The same system with different reagents may be used for a variety of pollutants and over different ranges of concentration. Thermo Stack Monitoring kit is one such Grab sampler water-soluble gaseous pollutants like SO_2, NOx, HF, Cl_2 , H_2S, NH_3 etc. in individual emission from stationary source/chimney and vent.

It is technically designed portable light weight kit, to estimate the emission pollutants in any kind of stack. This model is equipped with Digital Manometer which display velocity and Temperature indicator which helps to use this in isokinetic stack sampling.

MAIN FEATURES

- **Light weight, Easily carry here & there (like a suitcase)**
- **All accessories are in One Box (Pitot, Probe Pipe, Thimble Holder, Dry Gas Meter, Nozzles, Tools etc., all accommodated in an Aluminium Carrying Case (except Vacuum Pump Assembly) as shown in picture.**
- **Size and weight of panel has been reduced considerably.**
- **Pitot and probe pipe is being provided with extendable arm of 0.6m + 0.6m each.**
- **Rotameter attachment in order to normalize volume of the sampled gas.**
- **Portable light weight Rotatory vane type pump etc.**
- **Dry Gas Meter added in panel itself to measure total sample volume.**
- **Ambient Temperature Sensor with Digital Display.**
- **Time Minimize to manage the assembly time.**
- **Measures total quantity / volume of emissions.**
- **Determines velocity of gases.**
- **Provision of measuring temperature and suction pressure at metering point individually for PM & GAS stream.**
- **Minimum number of joints to minimize leakages.**
- **Compact hardware & portable light weight vacuum pump.**
- **Sampling train with simplified glass joints.**

PORTABILITY FOR ROUTINE SAMPLING

Only repeat and frequent monitoring can give a true insight into the emission characteristics. It is true more important to have a simple and handy device, which can be used more often with ease and convenience, rather than a bulkey and cumbersome system. At times transportation efforts become more hectic & expensive than the actual monitoring exercise. Based on experience and valuable feedback obtained from our large group of valuable customers. Regulatory authorities, consultants, and R & D centers, need for improved and handy instrument has been felt. Thermo stack sampler has been designed to overcome such problems.

The operating principle is simple. The particulate matter is collected over a filtration thimble. It entraps and absorbs various gaseous pollutants in suitable reagents, which are analyzed subsequently by simple wet chemistry methods to determine the concentration of specific pollutants.

TECHNICAL SPECIFICATIONS:

Stack temperature range	Ambient to 600° C read on a Digital Pyrometer			
Stack velocity range	3 to 60 m/sec			
Thermocouple	T/C sensor in SS 304 casing, length of insertion: 0.6m with 2m long cable			
Manometer	Digital with 0-1300 mm of H_2O range			
Pitot tube	Calibrated S-type fabricated-SS 304, 0.6 m extendable to 1.2m			
Particulate Sampling	2 - 30 LPM collection on thimble type filter up to 0.3 micron rating			
Gaseous sampling	0.2 - 3 LPM collection in a set of Borosilicate glass impingers			
Rotameter	Plastic body with 2% FSD accuracy, 0-30 LPM for PM and 0-3 LPM for GAS			
Sampling probe	Made from SS 304 tube, 0.6m length extendable to 1.2 m.			
Filter holder	Fabricated from SS 304 tube suitable to hold either Cellulose Filtration Thimble (size 28mm ID x 100 mm long) or Glass Micro Fibre Thimble (size 19mm ID x 90mm long)			
Nozzles	A set of **4** Stainless Steel Nozzles			
Digital clock	0-60minutes, 1 second readout with start and stop switch			
Sampling train	1 No. of 240 ml. Cap and 3 Nos. of 120ml cap, borosilicate glass impingers accommodated in ice tray, placed on the rear side of instrument panel with a provision to keep ice.			
Vacuum pump	Oil free Mono block rotary vane vacuum pump, single phase motor (230v) with more than 100 LPM free flow capacity.			
Dry gas meter	Resolution of 1L			
Size & weight (approx)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight (kg) (net)**
Stack instrument box	**700**	**350**	**300**	**18**
Vacuum pump assembly	**310**	**150**	**170**	**08**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF STACK MONITORING KIT THERMO TEI- 131

(AS PER DESIGN IS-11255 (PART- 3) & AS PER CPCB GUIDELINES)

INTRODUCTION

The most common and widely used method (world over) is extractive sample method or Grab sampling technique. Grab sampling technique is also often treated as the reference standard method. Grab sampling technique is not restricted to a specific pollutant. The same system with different reagents may be used for a variety of pollutants and over different ranges of concentration. Thermo Stack Monitoring kit is one such Grab sampler water-soluble gaseous pollutants like SO_2, NOx, HF, Cl_2, H_2S, NH_3 etc. in individual emission from stationary source/chimney and vent.

MAIN FEATURES

- **Digital pressure cell in place of cumbersome manometer.**
- **Measures total quantity / volume of emissions.**
- **Determines velocity of gases.**
- **Reduction in size and weight of panel.**
- **Extendable arm for Pitot and probe pipe.**
- **Probe set accommodated in a carrying case.**
- **Provision of measuring temperature and suction pressure at metering point individually for PM & GAS stream.**
- **Minimum number of joints to minimize leakages.**
- **Tripod stand for better accessibility.**
- **Compact hardware & portable light weight vacuum pump.**
- **Sampling train with simplified glass joints.**

PORTABILITY FOR ROUTINE SAMPLING

Only repeat and frequent monitoring can give a true insight into the emission characteristics. It is true more important to have a simple and handy device, which can be used more often with ease and convenience, rather than a bulkey and cumbersome system. At times transportation efforts become more hectic & expensive than the actual monitoring exercise. Based on experience and valuable feedback obtained from our large group of valuable customers. Regulatory authorities, consultants, and R & D centres, need for improved and handy instrument has been felt. Thermo stack sampler has been designed to overcome such problems.

The operating principle is simple. The particulate matter is collected over a filtration thimble. It entraps and absorbs various gaseous pollutants in suitable reagents, which are analyzed subsequently by simple wet chemistry methods to determine the concentration of specific pollutants.

TECHNICAL SPECIFICATIONS:

Stack temperature range	Ambient to 600° C read on a Digital Pyrometer			
Stack velocity range	3 to 60 m/sec			
Thermocouple	T/C sensor in SS 304 casing, length of insertion: 0.6m with 2m long cable			
Manometer	Digital with 0-1300 mm of H_2O range			
Pitot tube	Calibrated S-type fabricated-SS 304, 0.6 m extendable to 1.2m			
Particulate Sampling	2 - 30 LPM collection on thimble type filter up to 0.3 micron rating			
Gaseous sampling	0.2 - 3 LPM collection in a set of Borosilicate glass impingers			
Rotameter	Plastic body with 2% FSD accuracy, 0-30 LPM for PM and 0-3 LPM for GAS			
Sampling probe	Made from SS 304 tube, 0.6m length extendable to 1.2 m.			
Filter holder	Fabricated from SS 304 tube suitable to hold either Cellulose Filtration Thimble (size 28mm ID x 100 mm long) or Glass Micro Fibre Thimble (size 19mm ID x 90mm long)			
Nozzles	A set of **4** Stainless Steel Nozzles			
Digital clock	0 – 60 minutes, 1 second readout with start and stop switch			
Sampling train	1 No. of 240 ml Cap and 3 No. of 120ml cap, borosilicate glass impingers accommodated in ice tray, placed on the rear side of instrument panel with a provision to keep ice.			
Vacuum pump	Oil free Mono block rotary vane vacuum pump, single phase motor (230v) with more than 100 LPM free flow capacity.			
Size & weight (approx)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
Stack instrument box	480	380	140	07
Vacuum pump assembly	310	150	170	10
Probe set	810	155	210	14

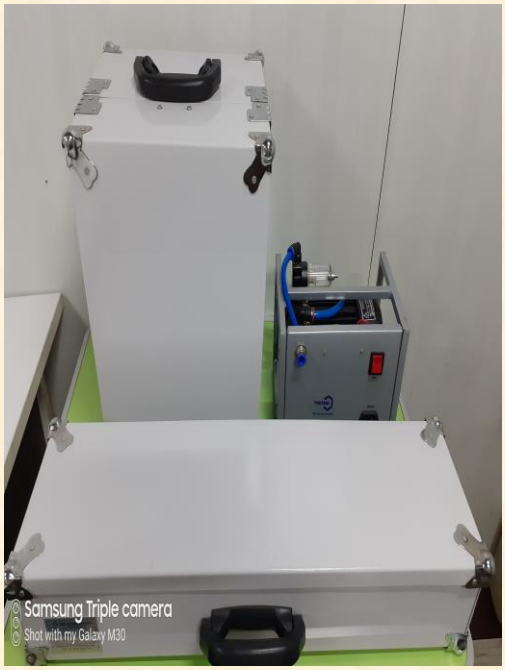
THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF STACK MONITORING KIT THERMO TEI 130 WITH VELOCITY MONITOR TEI 132 (WITH NEW FEATURES)

(AS PER DESIGN IS-11255 (PART- 3) & AS PER CPCB GUIDELINES)

INTRODUCTION

The most common and widely used method (world over) is extractive sample method or Grab sampling technique. Grab sampling technique is also often treated as the reference standard method. Grab sampling technique is not restricted to a specific pollutant. The same system with different reagents may be used for a variety of pollutants and over different ranges of concentration. Thermo Stack Monitoring kit is one such Grab sampler water-soluble gaseous pollutants like SO_2, NOx, HF, Cl_2 , H_2S, NH_3 etc. in individual emission from stationary source/chimney and vent.



MAIN FEATURES

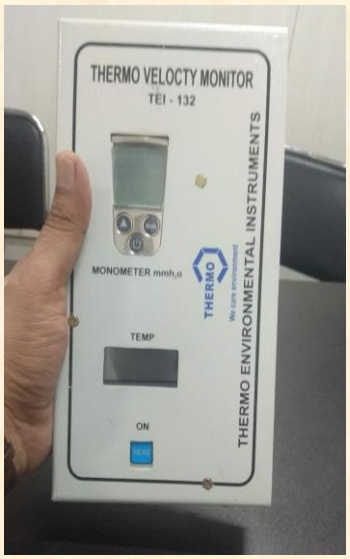
- **Velocity and Temperature separately provided in this system**
- **Time saving for sampling**
- **Digital pressure cell in place of cumbersome manometer.**
- **Measures total quantity / volume of emissions.**
- **Determines velocity of gases.**
- **Extendable arm for Pitot and probe pipe.**
- **Probe set accommodated in a carrying case.**
- **Provision of measuring temperature and suction pressure at metering**
- **Point individually for PM & GAS stream.**
- **Minimum number of joints to minimize leakages.**
- **Compact hardware & portable light weight vacuum pump.**
- **Sampling train with simplified glass joints.**

PORTABILITY FOR ROUTINE SAMPLING

Only repeat and frequent monitoring can give a true insight into the emission characteristics. It is true more important to have a simple and handy device, which can be used more often with ease and convenience, rather than a bulkey and cumbersome system. At times transportation efforts become more hectic & expensive than the actual monitoring exercise. Based on experience and valuable feedback obtained from our large group of valuable customers. Regulatory authorities, consultants, and R & D centers, need for improved and handy instrument has been felt. Thermo stack sampler has been designed to overcome such problems.

The operating principle is simple. The particulate matter is collected over a filtration thimble. It entraps and absorbs various gaseous pollutants in suitable reagents, which are analysed subsequently by simple wet chemistry methods to determine the concentration of specific pollutants.

VELOCITY MONITOR THERMO TEI 132



`Thermo' Velocity Monitor is designed to determine velocity of air/flue gas in duct/ pipe/chimney. In situations where determination of the rate of flow inside a chimney is of interest, this instrument can be used very conveniently to measure the total quantity/volume of emissions. It is provided with a Digital Pyrometer and Thermocouple for measurement of temperature. A digital pressure cell is incorporated in a hand held unit for the measurement of pressure in mm of H_2O directly along with a pitot tube. The pitot tube has been provided with an extendable arm for easy transportation.

TECHNICAL SPECIFICATIONS:

Stack temperature range	Ambient to 600° C read on a Digital Pyrometer			
Stack velocity range	3 to 60 m/sec			
Thermocouple	T/C sensor in SS 304 casing, length of insertion: 0.6 with 2m long cable			
Manometer	Digital with 0-1300 mm of H_2O range			
Pitot tube	Calibrated S-type fabricated-SS 304, 0.6 m extendable to 1.2m			
Particulate Sampling	0 - 60 LPM collection on thimble type filter up to 0.3 micron rating			
Gaseous sampling	0 - 6 LPM collection in a set of Borosilicate glass impingers			
Rotameter	Plastic body with 2% FSD accuracy, 0-30 LPM for PM and 0-3 LPM for GAS			
Sampling probe	Made from SS 304 tube, 0.6m length extendable to 1.2 m.			
Filter holder	Fabricated from SS 304 tube suitable to hold either Cellulose Filtration Thimble (size 28mm ID x 100 mm long) or Glass Micro Fibre Thimble (size 19mm ID x 90mm long)			
Nozzles	A set of **4** Stainless Steel Nozzles			
Digital clock	0 – 60 minutes, 1 second readout with start and stop switch			
Sampling train	1 No. of 240 ml Cap and 3 No. of 120ml cap, borosilicate glass impingers accommodated in ice tray, placed on the rear side of instrument panel with a provision to keep ice.			
Vacuum Pump	Oil free Mono block rotary vane vacuum pump, single phase motor (230v) with more than 100 LPM free flow capacity.			
Size & weight (approx.)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
Stack instrument box	**330**	**290**	**430**	**9.5**
Vacuum pump assembly	**310**	**150**	**170**	**10**
Probe set	**720**	**210**	**140**	**10**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF DIOXINS & FURAN MONITORING KIT THERMO TEI - 141

(AS PER DESIGN EPA - 23)

DIOXINS & FURAN EMISSION SAMPLER is a technically designed portable instrument, to estimate the Dioxins & Furans in Emission pollutants in any kind of stack. This model is equipped with Digital Manometer which display velocity and Temperature indicator which helps to use this in isokinetic stack sampling as per recommended USEPA 23 A method. This can also be used in monitoring of Heavy Metals in Stack Emission

MAIN FEATURES:

- **Specially to monitor Dioxins, Furan, & Provision for Monitoring of Heavy Metal Emissions.**
- **Isokinetic Sampling.**
- **Monitoring of SO3**
- **Collection based on wet chemical techniques.**
- **Measures total quantity / volume of the emissions.**
- **Heating PROBE & Box Assembly with auto temp controller.**
- **Rugged & convenient for sampling for long duration with oil**
- **Free vacuum pump assembly.**
- **Glass lining inside the nozzle, Filter holder & probe pipe.**
- **Tripod stands for better accessibility.**
- **Probe set accommodated in a carrying case.**
- **Convenient to use.**

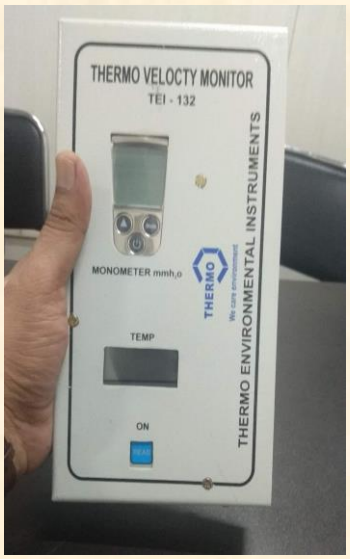
TECHNICAL SPECIFICATIONS

Stack Velocity Range	0 to 60 m/sec
Temperature Sensor	At Metering Point (0-50 o C)
Ambient Temperature	Digital display
Sampling Probe	Borosil Glass tube, 1 M length (to control 120°C heating), encapsulated with 1 M long SS heating probe
Particulate Sampling	0 – 25 LPM collection on thimble type filter up to 0.3 micron rating .
Gaseous Sampling	0 - 10 LPM, collection in a set of Borosilicate Glass Impingers. 0 - 1 LPM FOR VOC SAMPLING
Thermocouples	Thermocouple sensor in SS 304 casing, length of insertion: 1 m with 2m long cable. Additional 1m thermocouple for High Temperature range
Pitot tube	Calibrated S-type Pitot tube fabricated from SS304, 1m length
Nozzles	A set of 5 Glass Nozzles
Thimble Holder	Glass Thimble holder with heating provision
Manometer	Digital Manometer 1 To 1500 mmh2o
Rotameter	Acrylic body Rotameter with 2% FSD accuracy, 0 – 25 LPM for Particulate and 0-10 LPM for gases. 0 -1 LPM for VOC
Sampling Train	Condenser Glass Coil – 1 No., Moisture Bottle – 1 No., XAD Cartridge tube - 1 No. accommodated in separate ice box with Instrument panel with a provision to cool down gaseous temp.
Temperature Controller	2 Nos. (One at probe and one at Thimble holder).
Dry Gas Meter	0 - 40 LPM, connected to line
Vacuum Pump	Oil Free Diaphragm, 0.5 HP single phase motor (220V) with more than 50 LPM free flow capacity.

Size & weight (approx)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
Stack instrument box	400	390	480	10
Vacuum pump assembly	275	200	245	18
Probe set	1250	320	230	20

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF VELOCITY MONITOR THERMO TEI 132



`Thermo' Velocity Monitor is designed to determine velocity of air/flue gas in duct/ pipe/chimney. In situations where determination of the rate of flow inside a chimney is of interest, this instrument can be used very conveniently to measure the total quantity/volume of emissions. It is provided with a Digital Pyrometer and Thermocouple for measurement of temperature. A digital pressure cell is incorporated in a hand held unit for the measurement of pressure in mm of H_2O directly along with a pitot tube. The pitot tube has been provided with an extendable arm for easy transportation.

TECHNICAL SPECIFICATIONS

Stack Temperature Range	Ambient to 600 deg C read on a Digital Pyrometer			
Stack Velocity Range	3 to 100 m/sec			
Thermocouple	Thermocouple sensor in SS 304 casing, length of insertion: 1 Mtr. with 2m long cable			
Manometer	Digital with 0-1300 mm of H_2O Range with 0.1mm least count.			
Pitot Tube	Modified S-type pitot tube Fabricated from SS 304, 1 mtr. Length - Calibrated			
Size & weight (approx.)	**Length (mm)**	**Width(mm)**	**Height(mm)**	**Weight(kg) (net)**
VM TEI 132 instrument Panel	**200**	**115**	**35**	**01**
Probe Kit	**820**	**170**	**110**	**05**

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF HANDY SAMPLER THERMO TEI-181 / 171

(FOR TOTAL DUST & 3 GASES LIKE SO2/NOX/O3 & VOC)

TEI MODEL NO. TEI-181 (AC-220 Volt) - 0 to 10 LPM (FREE FLOW)
TEI MODEL NO. TEI-171 (Battery Operated) - 0 to 10 LPM (FREE FLOW)

The increasing awareness of health hazards to due to industrial pollution impact specifically for industrial workers, there is a requirement to measure the health hazards in work zone monitoring for assessment of exposure of hazardous substances at work place. Thermo Handy Sampler has been developed to fulfill such kind of monitoring needs.

This instruments are operate by pump to draw air thorough a suitable absorption solution contained in an impingers (03 impingers can be used in series) to monitor 3 gaseous pollutants. There is an additional provision to determine particulate matter as well by using the open sampling head which takes 37mm diameter filters.

This instrument can be used to monitor pollutants including oxides of sulphur and nitrogen, halogens, ammonia, sulphides, etc. The particulate sampling head provided with the system would be useful for monitoring particulates like silica, cement dust, metal fumes, asbestos fibers, etc. in work Places of cement plants, foundries, etc.

MAIN FEATURES OF TEI 181	MAIN FEATURES OF TEI 171
• Powder coated Aluminum cabinet • 220 volt AC operated pump runs for a full shift of 6 To 8 hrs. • Sampler can be operated with A/c current as well Charging • Digital Timer to facilitate unattended operation • • Rotameter – 3 Nos. 0 To 3 LPM for Gas Sampling 0 To 1 LPM for VOC Sampling 0 To 10 LPM for other parameter like SPM, Asbestos Fibers Sampling, Silica and other	• Powder coated Aluminum cabinet • Battery Operated 12 Volt DC Operated pump runs for a full shift of 6 To 8 hrs. • Sampler can be operated with A/c current as well Charging • Digital Hour Meter to facilitate unattended operation • Rotameter – 3 Nos. 0 To 3 LPM for Gas Sampling 0 To 500 Ml. for VOC Sampling 0 To 10 LPM for other parameter like SPM, Asbestos Fibers Sampling, Silica and other
Power Supply : 220V (+/-) 10V AC, 50Hz Sampling Rate : 0.1 – 10 LPM Suction Pump : Built-in Diaphram type pump. Timer : 99 Hrs. Programmable timer. Operation Time : 6 - 8 hours	Power Supply : 220V (+/-) 10V AC, 50Hz Sampling Rate : 0.1 – 10 LPM Suction Pump : Built-in Diaphragm type pump. Hour Meter : 9999.99 Hour Meter. Operation Time : 6 - 8 hours

Size & weight (approx)	*LENGTH (MM)*	*WIDTH(MM)*	*HEIGHT(MM)*	*WEIGHT(KG) (NET)*
	260	*185*	*200*	*5KG.*

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF HANDY SAMPLER THERMO TEI-191 - 0 to 10 LPM (FREE FLOW) (BATTEY OPERATED)

(FOR TOTAL DUST PM 10, PM 2.5, & 3 GASES LIKE SO2/NOX/O3 & VOC)

The increasing awareness of health hazards to due to industrial pollution impact specifically for industrial workers, there is a requirement to measure the health hazards in work zone monitoring for assessment of exposure of hazardous substances at work place. Thermo Handy Sampler has been developed to fulfill such kind of monitoring needs.

This instruments are operate by pump to draw air thorough a suitable absorption solution contained in an impingers (03 impingers can be used in series) to monitor 3 gaseous pollutants like SO2, NOx, O3 and VOC Sampling and for other parameter Asbestos Fibers Sampling, Silica and others etc.. There is an additional provision to determine particulate matter air sampler to collect either PM 10, PM 2.5 or TSPM particles, but at a time, only one sampling can be possible.

This Handy Sampler TEI- 191 samples ambient air sampling flow rate 5 litters / minute for Particulate Matter (PM10, PM2.5, and TSP). While not a reference method sampler, the TEI-191 gives results that closely approximate data from particulate matter samplers, Portable and Light & Weight.

TEI-191 is ideal for remote areas or locations where no permanent electricity has been established. The battery can power the sampler for 24 Hrs. of continuous sampling before the battery full charged.

The TEI-191 features an elapsed time totalizer, operation from rechargeable batteries. The filter holder assembly can be configured for TSP, PM10, or PM2.5 sampling,. For particulate sampling the uses 47mm filters to collect particulate matter. Filters should be weighed pre and post exposure with a microbalance accurate to one microgram/cubic meter. The Handy Sampler TEI 191 is a versatile platform that is attractive to end users. With a broad range of customers, the reliable and proven Mini Volume Sampler system has made a place for itself in the air quality industry. Improving upon the best in portable air sampler, the leads the way for the next generation of innovative air sampling equipment.

This instrument can be used to monitor pollutants including oxides of sulphur and nitrogen, halogens, ammonia, sulphides, etc. The particulate sampling head provided with the system would be useful for monitoring particulates like silica, cement dust, metal fumes, asbestos fibers, etc. in work Places of cement plants, foundries, etc.

TECHNICAL SPECIFICATIONS:

Flow Range	0 - 10 LPM			
Sampling Flow rate	0.2 - 5 LPM			
Filter Media	Filter holder designed to accept any standard 47 mm diameter filter media			
Rota meter	• 0 To 3 LPM for Gas Sampling • 0 To 500 Ml. for VOC Sampling • 0 To 10 LPM for PM 10, PM 2.5 or TSPM particles			
Hour Meter	9999.99 Hour Meter			
Suction Pump	Built-in Diaphragm type pump			
Battery	11.1 V x 10400 mAh			
Battery Charger	Single phase AC 220 Volts, 50 Hertz supply. Sampler unaffected by +/-10% fluctuation in supply voltage for battery Charging			
Size & weight (Approx.)	*LENGTH (MM)*	*WIDTH(MM)*	*HEIGHT(MM)*	*WEIGHT(KG) (NET)*
	260	*185*	*200*	*7 kG.*

THERMO ENVIRONMENTAL INSTRUMENTS

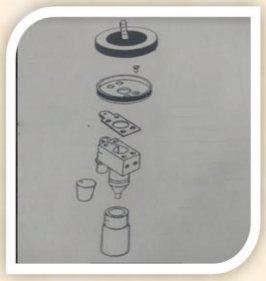
LITERATURE OF PERSONAL SAMPLER THERMO TEI – 421 (OCCUPATIONAL HYGIENE)

(BATTERY OPERATED) (FOR SHOP FLOOR / INDOOR MONITORING)

Needs of monitoring exposure of the total air borne dust as well as the Respirable fraction of dust, Thermo has developed a light-weight, battery operated Personal Sampler equipped with a cyclonic system. The sampler can be mounted on the body of the worker. The sampler has a compact aluminum cabinet with a clip so that the system can be belt worn.

The cyclone designed for cut off at 5 microns as recommended by DGMS for measurement of worker exposure to Respirable dust. The air leaving the cyclone, having particles of the size 5 microns or less passes through glass microfiber filter of 37mm dia. housed in Teflon filter holder fitted at the top of cyclone where Respirable dust get accumulated and can be quantified gravimetrically. The collected dust can further be analyzed for specific constituents viz. lead, other heavy metals, silica, etc. This instrument can sample air at flow rates from 0.5 to 3.0 LPM. For optimum efficiency of the cyclonic system, the flow rate needs to be maintained between 1.6 and 1.9 LPM.

The total weight of the instrument is less than one kilogram. The IAS is capable of sampling air at flow rates ranging from 0-3 LPM which is the desired rate for most of the dust (e.g. Silica asbestos, oxides of lead, cadmium, chromium, arsenic manganese etc…) Rechargeable Li-ion batteries have been used with sufficient storage to operate the system for a full shift of 8 hours making it easier to compare workers dose to the TLV levels specified. A separate charger is provided with this Sampler to recharge the batteries overnight.



TECHNICAL SPECIFICATIONS:

FLOW RATE	0.5 - 3.0 LPM
CYCLONE	Brass with Teflon filter holder to cut-off at 5 microns
FILTER	37 mm dia glass fibre filter discs
OPERARTION TIME	8 hours on fully charged batteries
BATTERY	11.1 Volt Li-ion rechargeable battery
RECHARGE TIME	12-14 hours after discharge
SIZE	150 x 95 x 60 mm
WEIGHT	1.3 Kg approx. (with cyclone)

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF VOC / BENZENE SAMPLER THERMO TEI- 381(Battery operated)

The increasing awareness of health hazards to due to industrial pollution impact specifically for industrial workers, there is a requirement to measure the health hazards in work zone VOC / Benzene monitoring for assessment of exposure of hazardous substances at work place. Thermo VOC / Benzene Sampler TEI-381 has been developed to fulfill such kind of monitoring needs Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust and from industry producing or using it. These sources contribute to elevated levels of Benzene in the ambient air, which may subsequently be breathed by the public. EPA has classified benzene as known human carcinogen for all routes of exposure.

Our VOC / Benzene Sampler TEI-381 (Battery Operated) is used for collection of samples of Benzene and other VOC's in ambient air. The organic compounds are collected from ambient air by adsorption on an activated charcoal column. The organics are then desorbed and analysed via a Gas Chromatograph to estimate its actual concentration. Designed with the best engineering approach, the Thermo environmental Instruments made Benzene Sampler comes along with an inbuilt differential pressure and velocity meter. The sampler is battery operated for uninterrupted usage and has a flow meter in the range of 20-200ml/min. Provision for low flow control allows the instrument to collect a representative sampler over several hours without fear of sampler loss due to saturation or breakthrough in the adsorbing column.

MAIN FEATURES

- **Portable, Maintenance free Rechargeable battery operated instrument with easy user interface**
- **Upon full charge the rechargeable Lithium Ion battery pack allows operation for at least 6 - 8 hours.**
- **Sampler can be operated with A/c current as well**
- **Flow meter provides accurate flow reading in the 20-200 ml/min flow range.**
- **Flow meter provides total volume of air sampled in litters.**
- **Oil free pump provides low noise and requires little maintenance.**
- **Can be used for monitoring a wide variety of organic compounds.**
- **Instrument comes along with charger for battery charging and one activated charcoal filled tube.**

TECHNICAL SPECIFICATIONS:

FLOW RATE	0.1 - 500 ML
FLOW	FLOW CONTROLER
FILTER	25 mm dia glass fibre filter discs
OPERARTION TIME	8 hours on fully charged batteries
BATTERY	11.1 Volt Li-ion rechargeable battery
RECHARGE TIME	6 hours after discharge
SIZE	150 x 150 x 150 mm
WEIGHT	2.5Kg approx.

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF TCLP ROTATRY AGITATOR THERMO MODEL TEI – 551 (8 Samples)

(FOR SOLIDS AND WASTES) (AS PER METHOD U.S. EPA-1311)

ROTARY AGITATOR (TCLP) The Toxicity Characteristic Leaching Procedure (TCLP) is a soil sample extraction procedure for chemical analysis, employed to chemically determine if a waste is characteristically hazardous. Hence, TCLP analyses the mobility of both organic and inorganic analyses present in liquid, solid and multiphase waste.

During TCLP, rotary agitators are required. Rotary agitators are used for continuously 'agitating' stored liquids, to prevent the liquids from settling and separating into its various components, assuring a uniform liquid consistency. The rotary agitator is the result of developments from a line of preceding agitators, including the aerating agitator, flotation apparatus and the agitator suction tube combination.

Thermo Rotary Agitator is designed for use with the TCLP procedure. The rotary agitator provides end-over-end rotation, as required by the USEPA, for through mixing and extraction of TCLP samples. The rotary agitator fits for 1–8 bottles (1 Ltr.)

Thermo Rotary Agitator Model TEI-551 are used for evaluating the mobility of regulated compounds for EPA test method 1311 TCLP (Toxicity Characteristic Leaching Procedure) and Other leaching procedures listed in EPA.

FEATURES:

- A safety shield covering the rotor and a motor guard designed for maximum safety.
- The Body parallel shaft gear motor is designed for applications that require consistently long life and high output torque in relation to gear motor size.
- The agitator requires less bench or floor space than traditional models.
- The gear motor provides quiet operation.

SPECIFICATIONS

Agitator housing	Aluminium			
Rotary spindle	Aluminium casting			
Retainer clamps	Aluminium			
Hand wheel knobs	Plastic with brass thread insert			
Electrical	220V/50 Hz, 0.63A			
Speed	10 to 100 RPM			
Size & Weight Approximate	Length (Inch)	Width	Height	Weight
	42	15.5	18.5	Approx. 30 kg

THERMO ENVIRONMENTAL INSTRUMENTS

LITERATURE OF TOP LOADING ORIFICE CALIBRATOR THERMO MODEL TEI - 112 TL

Accurate flow measurement is fundamental to this method for accurate determination of the extent of pollution in the air. US EPA and other pollution control authorities recommend that an air sampler (particularly Respirable Dust sampler) should be calibrated at regular intervals in the field using a calibrated orifice flow rate transfer standard. The orifice transfer standard should be recertified once every year. The set of five multi-hole resistance plates are used to change the flow through the orifice so that several points can be obtained for the air sampler calibration curve.

Thermo Top Loading Orifice Calibrator is an apparatus, designed as per EPA specifications, which makes easy the task of in-field calibration of blower flow meter in Respirable Dust samplers of Thermo make as well as all other standard makes. Top Loading Orifice Calibrator is a flow transfer standard which can be taken to the field for in in-situ calibration of the samplers without disassembling any flow measuring device of the sampler.

The Top Loading Orifice Calibrator (TLOC) assembly is fabricated as per US EPA design. Cylindrical pipe, an orifice plate, gaskets and mounting accessories. . The cylindrical pipe is mounted directly on top of the resistance plate. The transfer standard orifice is fixed on the top of the cylindrical pipe. A pressure tap below the orifice is provided on the cylindrical pipe. This tap is used to measure pressure across the orifice, which is a measure of flow.

Top Loading Orifice Calibrator model TEI-112 TL an orifice assembly, a set of five multiple resistance plates a manometer assembly. The manometer assembly employed in model TEI-112 TL comprises a Digital Manometer for measurement of differential pressure across orifice. The flow is determined from the calibration graph of flow v/s dp provided with the calibrator.

Detailed Technical Specifications

Orifice Assembly Specification :

Cylindrical housing	With pressure tap nozzle
Orifice Plate	Precision machined SS as per USEPA mounted on cylindrical housing
Resistance plates	5 plates – 1 each with 17, 13, 10, 7 & 5 holes for varying flows
Material of construction	Aluminum with high quality finish
Dimensions & Weight	Size – 325 x 115 mm Weight- 2.25 Kg.

Manometer Assembly

Functions	Pressure measurement
Flow Measurement Accuracy	±2% of Full Scale
Pressure Measurement Range	0 to 1000 mm WC
Manometer Type	Digital Manometer
Scale Graduation Resolution	1 mm
Calibration Report	Provided with traceability to National standard

THERMO ENVIRONMENTAL INSTRUMENTS