In-situ Non –sampling light scattering dust concentration measuring instrument for wet flue gas.

Model :DDM-TMA1 (Nickname :tamaichi)
& DDM-TMA1c

Tanaka Electric Laboratory Co., Ltd.


High sensitivity
Durable and reliable
Ultra low maintenance
Simple installation
DUST DENSITY METER
DDM-TMA1
tanaka

Tanaka Electric Laboratory

is ISO9001 certified, serving high quality and reliable services and products over 55 years, has been a leading compnay for dust monitoring sytems in Japan. Tanaka Electric Laboratory dust monitoring systems are high quality, reliable, robust, and easy to use and to maintain. They have being used in major electric power plants, iron mills, waste plants in Japan and South Asian countries and the product quality has been proven in the fields over 25 years.

Compliance and CSR

have recently been increasingly known by the industries that emit flue gas into the atmosphere. The dust contained in flue gas can cause environmental pollution and health issues, and reducing the dust emitted from a plant/factory is a global demand. In many countries the governments enforce air pollution laws. *CSR: Corporate Social Responsibility

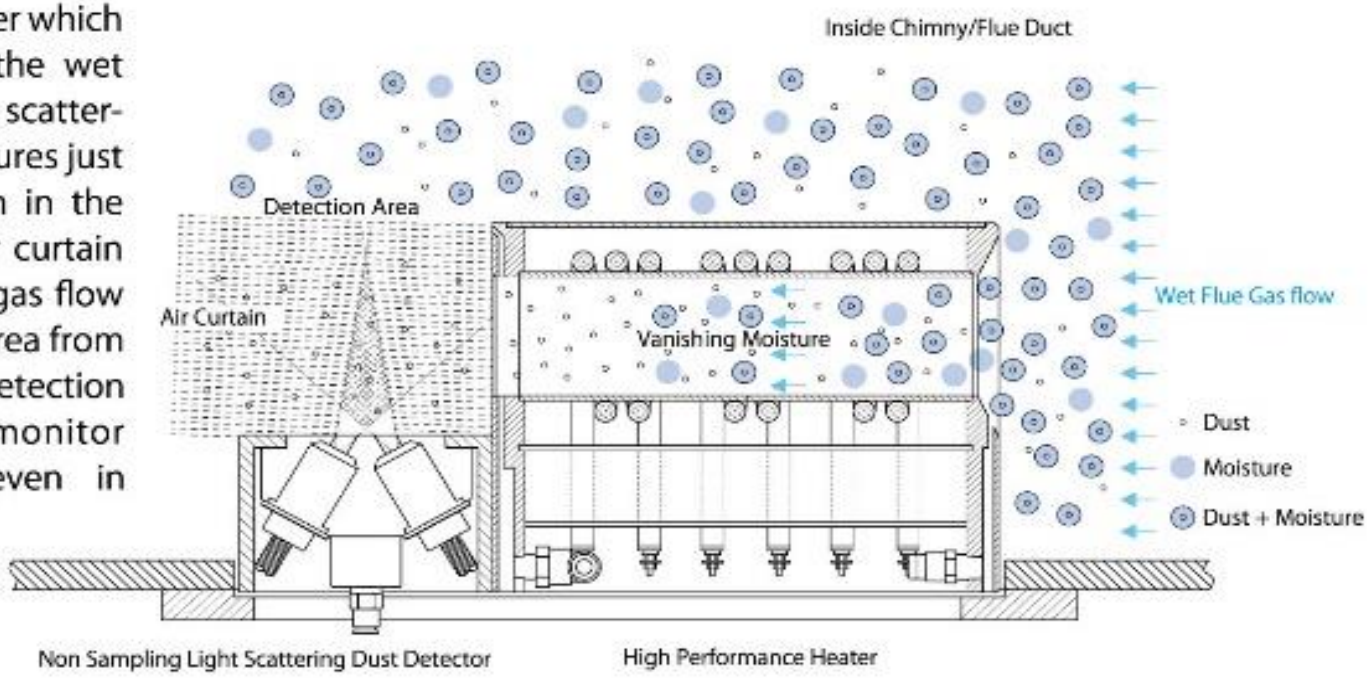
Tanaka Electric Laboratory dust monitoring systems

has helped run a plant/factory more cleanly and efficiently and to establish corporate compliance and CSR. The features of Tanaka Electric Laboratry dust monitoring sytems are:
>the industry proven accuracy >reliability, robustness, durability >simple installation > easy maintenance.

Tanaka Electric Laboratory Light Scattering Detector

provides reliable monitoring in harsh conditions such as highly electrically charged gas, high humidity gas, and variable velocity gas, and the detector has an excellent sensitivity. The light scattering method uses an optical sensor and provides excellent noise resistance. Its unique detector design and integrated purge air system makes the detector almost maintenance free. In addition, the installation of the detector is very simple as well.

DDM-TMA1 (its nick name is Tamaichi) is designed to measure the dust concentration in wet flue gases. The measuring principle of DDM-TMA1 is Non-sampling Light Scattering method. The wet flue gas passes inside of the high performance heater which vanishes the mist in the wet flue gases, and the light scattering dust detector measures just the dust concentration in the wet flue gases. The air curtain prevents the wet flue gas flow around the detection area from interfering with the detection area. DDM-TMA1 can monitor dust concentration even in heavy wet flue gases.



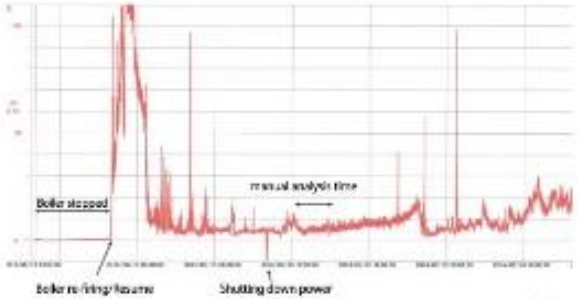
DDM-TMA1c is designed for CEMS in order to measure the dust concentration within 30% center area of flue gas duct.This model is also non-sampling method as same as our other products, and no effects from variable velocity gas.It's unique detector design based on duct wall mount type DDM-TMA1 and detector is installed at head of probe. Light scattering light signal will send by fiber optics inside of this probe.

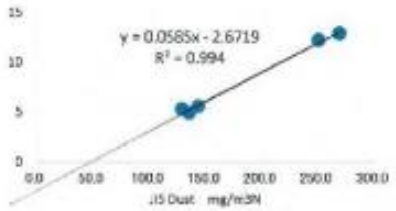
Easy Installation and maintenance

The installation of DDM-TMA1 is simple and costs you less. DDM-TMA1 is made of two major components; detector with heater and control box. The detector and the control box are connected by optical fiber cables. To install the detector you need just one hole on a stack and minimal work space. The control box is small and light weight. It can be easily installed anywhere and can be isolated from high heat and static magnetic field from the stack for maximum accuracy and reliability.

Approvals / Field-Proven Performance

Paper Mill, Heavy Oil Boiler Scrubber Output.
DDM-TMA1 detected the dust in the wet flue gas.





DDM-TMA1 JISZ8808 calibration curve
(correlation coefficient is 0.994)

Oil Power Plant, Mixed Fuels Boiler

DDM-2001 at EP outlet

DDM-TMA1 at desulfurization outlet

Simultaneously measuring the dust concentration in dry flue gas at EP outlet with DDM-2001 and the dust concentration in wet flue gas at desulfurization outlet with DDM-TMA1 for reconcilation with the results. The both dust detectors' results are reconciled.

Features

- directly monitor dust concentration in wet flue gases at real time
- consistent and accurate; no sampling, no error caused by irregular sampling air flow (sampling method)
- easy installation; you only need one hole for installation; simple design, compact, and light weight; fit in a small space
- easy maintenance; purge air minimizes the dust buildup on the optical detectors and the heater
- automatic self calibration, can be calibrated, maintained, or fixed while a plant is running, and flue gas is still running
- field-proven aquracy; the measured value's correlation coefficient with the Isokinetic Sampling method is very high, in compliance with JIS Z8852 which is a Japanese goverment standard method for monitoring dust in flue gases

Applications

- coal/heavy oil power plants
- iron mills
- Paper mills
- waste water sludge plant
- metal refinary
- scrubber wet dust collector outlet
- any facilities which use flue gas desulfurization (FGD) or/and Wet EP

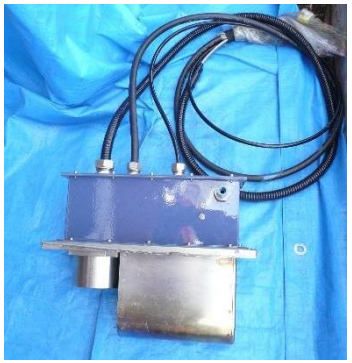
Benefits

- Improve plants' productivity
- reduce running cost
- improve plant equipment life time

Patent

- China Patent. CN106248628B 26/march/2019
- Japan Patent. (No.5453607, No.5976885, No.6204941)

DDM-TMA1 Installation procedure to FGD outlet duct



Cut the hole to the duct and welding flange

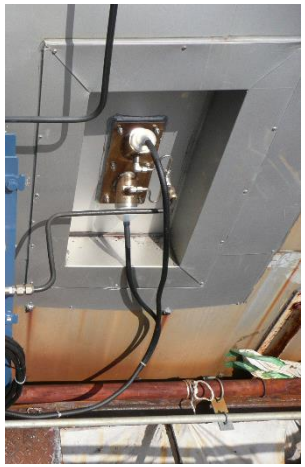
Attach the detector to the duct

Wiring and piping to DDM-TMA1

Zero & Span adjustment and set heater temperature of DDM-TMA1

（Thermal electric power station of heavy oil and oil residue boiler） Sep.2015

White smoke from chimney



EP outlet (clear flue gas）model:DDM-2001

Inside of FGD outlet duct

FGD outlet (white moisture gas) model:DDM-TMA1

Continuous measuring data
（comparison between outlet of EP and outlet of FGD）

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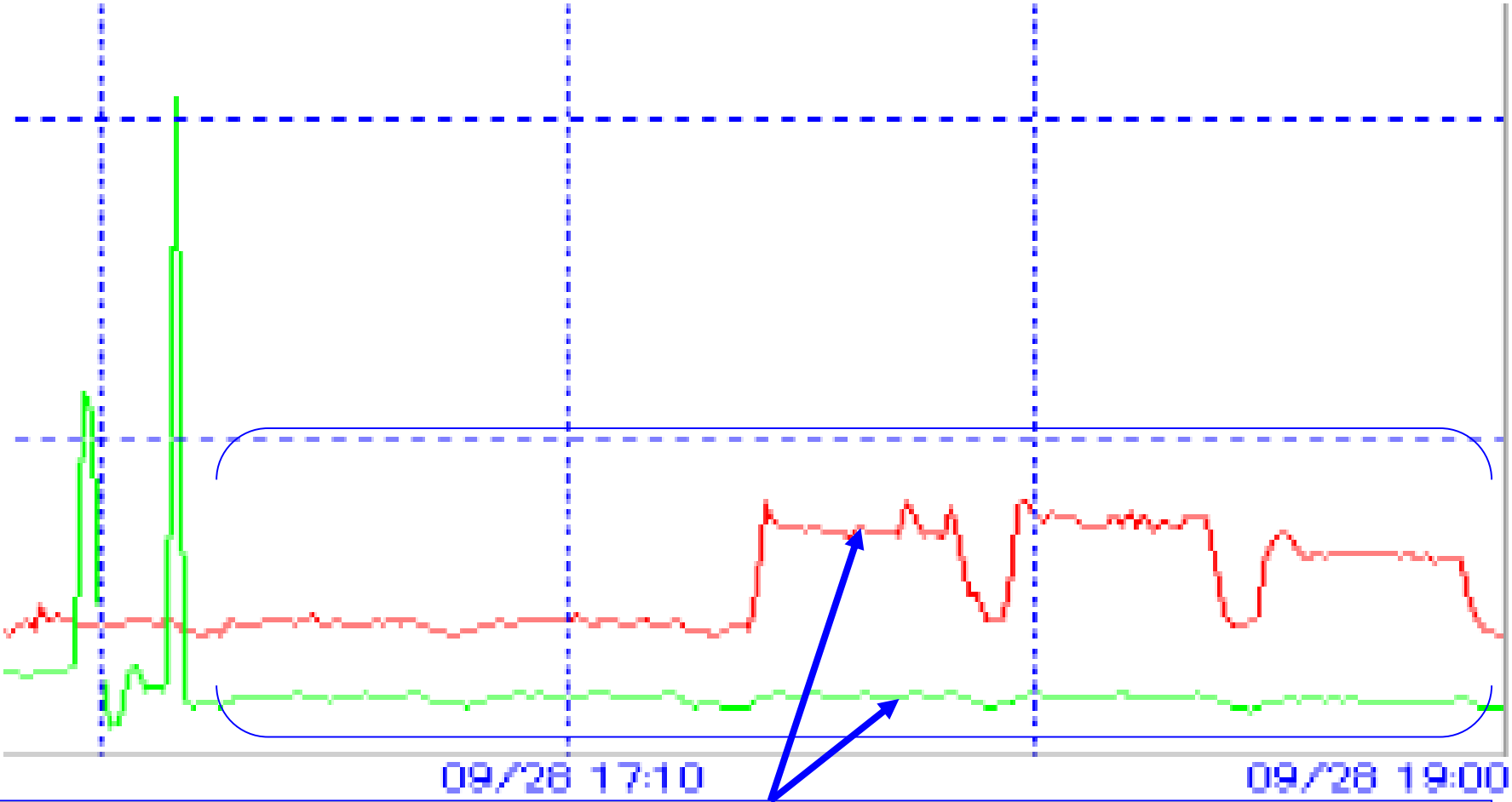
EP outlet DDM-2001 trend data (Red)

FGD outlet DDM-TMA1 trend data (Green)

Zoom up comparison between DDM-2001 and DDM-TMA1 trend data



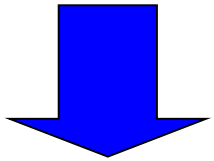
Outlet of EP and FGD trend data are synchronized.

Even when the EP electrode is hammering, the FGD outlet dust concentration is low according to the data revealed by DDM-TMA1

Flue gas condition at comparison data

FGD(Flue Gas Desulfurization) outlet : white moisture with mist

- Flue gas temperature ： 40℃～50℃
- Flue gas velocity ： actual measurement **4～10m/sec**



Extraction type dust measuring instrument has dust concentration error caused by velocity difference between flue gas and suction.

Our in-situ DDM-TMA1 is non-sampling light scattering with vaporizing method.

No affect by flue gas quickly changing of velocity.

Detector

Inside of Chimney / Flue Duct

DDM-TMA1

Non Sampling
Light Scattering
Detector

Optical Fiber cable

Heater

Chimney/Flue Duct wall

Chimney/Flue Duct wall

Inside of Chimney / Flue Duct

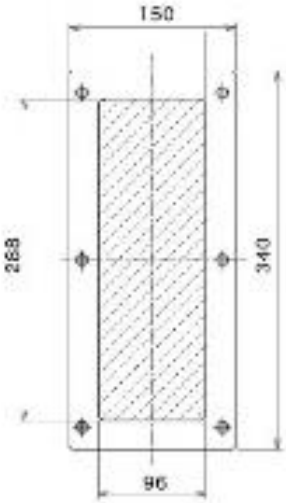
DDM-TMA1c

Non Sampling Dust Detector &
Heater

Optical Fiber cable

Control Box

Installation Flange



Non Sampling Dust Detector & Heater

Specifications

detector	non sampling light scattering method with heater
method	scattered light method
light source	LED
measuring range	0~100mg/Nm3 equivalent 0~100% output *measuring ranges are valiable
external output	DC4~20mA isolation output (load realstance 550Ω<)
	RS-232C I/F output
display	digital indicator of 0~100%
fault indicator	main controller's power failure, abnormal spaning, abnormal internal voltage, heater failure
	AC/DC200V, 0.1A
zero span calibration	automatic or manual (default factory setting)
	AC/DC200V, 0.1A
ambient temperature	external output ±2%/10℃(20℃)
correlation coeffcient analysis	0.9 or above
flue gas temperature	from 45℃ up to 250℃
flue gas speed	approximately up to 12m/Sec
flue gas pressure	up to10kPa
power supply	control unit : AC100V±10% (50/60Hz), 200VA
	heater:AC200V±10% (50/60Hz), 1.8kVA
ambient temperature	−10~50℃(operational temperature)
protection class	IP54
dimensions	detector : 340x150x272mm
	flange hole : 288x96mm
	Control box : 414x378x230mm
optical fiber cable	Φ5mmx2.3m
weight	detector : approximately 10kg(optical fiber cable is not included)
	control box : approximately 20kg

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