CEMS

Continuous Emission Monitoring System

Technical Presentation

TECNOVA HT
Field Instrumentation Liquid and Gas Analysis Systems

- PRESENTATION CONTENTS-

- CEMS Definition
- Typical Customer Inquiry
- Configuration Data Sheet
- Typical System Configuration and Certificates
- Typical Tecnova HT Proposal
- Project Implementation
- Major Installation pictures
- Major Reference List of Gas Analysis

TECNOVA HT
Field Instrumentation Liquid and Gas Analysis Systems

- CEMS DEFINITIONS -

♦ «Continuous Emission Monitoring System» is related to the monitoring of flue gas for Oxygen, Carbon Monodioxide,Sulphur Dioxide, Hydrogen Clorine, Nitrogen Oxide etc..according to typical industrial plants/ power station/ incinerators/ Refinery/ Petrochem ect..

In the industrial installations the level of emissions has to comply with standard values according to major «Enviromental Protection Agency» like EPA/USA ; EN/ Europe ; JQA/Japan ect..

Above standards are strictly indicated and suggested by the International agreement as per KYOTO Protocol

- TYPICAL CUSTOMER INQUIRY-

♦ Customer inquiry is related to specific emission regulation according to Local Authorities

♦Local Authorities dictate the number of components to be analysed and related emission limited values

♦Customer specifications will include all process data for required plant applications useful for analysis system development

- CONFIGURATION DATA SHEET –

- This document defines respectively:

♦ General characteristics for system description

♦Installations characteristics for enviromental conditions

♦Process data like elements, concentration, measuring units,

(temp / flow/ density/ dust ect…)

♦Auxiliary measurements for flow; pressure; temperature; dust with specific elements.

♦ Data acquisition

TECNOVA HT Field Instrumentation Liquid and Gas Analysis Systems	**SISTEMA DI ANALISI / *Analysis System*** FOGLI DATI DI CONFIGURAZIONE / Configuration datasheets	DOCUMENTO N. / *Document N.* **MOD 07-17-CI-1**
	CLIENTE / *Client* **XXXXXX**	FOGLIO / *Sheet* **1** DI / *Of* **1**
	IMPIANTO / *Plant* **XXXXXX**	
	COMMESSA / *Job* **XXXXXX**	REVISIONE / *Revision* **0**

CARATTERISTICHE DI INSTALLAZIONE / *Installation characteristics*

1	**CONDIZIONI AMBIENTALI / *Environmental conditions***
2	Luogo di installazione : *Installation place :* ☐ Esterno *Outdoor* ☐ Interno *Indoor* ☐ — Ambiente climatizzato : *Air-conditioned :* ☐ NO ☐ SI / *Yes*
3	Atmosfera : *Atmosphere :* ☐ Salina *Salt laden* ☐ Industriale *Industrial* ☐ Non corrosivo *Not corrosive* ☐
4	Area classificata : *Hazardous area :* ☐ NO ☐ SI / *Yes* [SE SI INDICARE QUI LA CLASSIFICAZIONE DELL' AREA] *[If yes specify here the area classification]*
5	Temperatura ambiente : *Ambient temperature :* min … °C max … °C — Temperatura di progetto : *Design temperature :* min … °C max … °C
6	Umidità relativa : *Relative humidity :* min … % max … %
7	
8	
9	**UTILITIES DISPONIBILI / *Available utilities***
10	Energia elettrica : *Power supply :* 1 - … V ☐ CC DC ☐ CA AC … Hz … fasi *phases* Neutro : *Neutral :* ☐ NO ☐ SI *Yes* Da UPS : *From UPS :* ☐ NO ☐ SI *Yes*
11	2 - … V ☐ CC DC ☐ CA AC … Hz … fasi phases Neutro : Neutral : ☐ NO ☐ SI *Yes* Da UPS : From UPS : ☐ NO ☐ SI *Yes*
12	3 - … V ☐ CC DC ☐ CA AC … Hz … fasi phases Neutro : Neutral : ☐ NO ☐ SI *Yes* Da UPS : From UPS : ☐ NO ☐ SI *Yes*
13	
14	Aria compressa : *Compressed air :* pressione *pressure* min … barg max … barg progetto *design* … barg — Secca e disoleata : *Dry and oil free :* ☐ NO ☐ SI *Yes*
15	temperatura *temperature* min … °C max … °C progetto *design* … °C
16	Acqua : *Water :* pressione *pressure* min … barg max … barg progetto *design* … barg
17	temperatura *temperature* min … °C max … °C progetto *design* … °C
18	Vapore : *Steam :* pressione *pressure* min … barg max … barg progetto *design* … barg
19	temperatura *temperature* min … °C max … °C progetto *design* … °C
20	Azoto : *Nitrogen :* pressione *pressure* min … barg max … barg progetto *design* … barg
21	temperatura *temperature* min … °C max … °C progetto *design* … °C
22	Idrogeno : *Hydrogen :* pressione *pressure* min … barg max … barg progetto *design* … barg
23	temperatura *temperature* min … °C max … °C progetto *design* … °C
24	Altro : *Other :* 1 -
25	
26	2 -
27	
28	3 -
29	
30	
31	
32	
33	
34	
35	

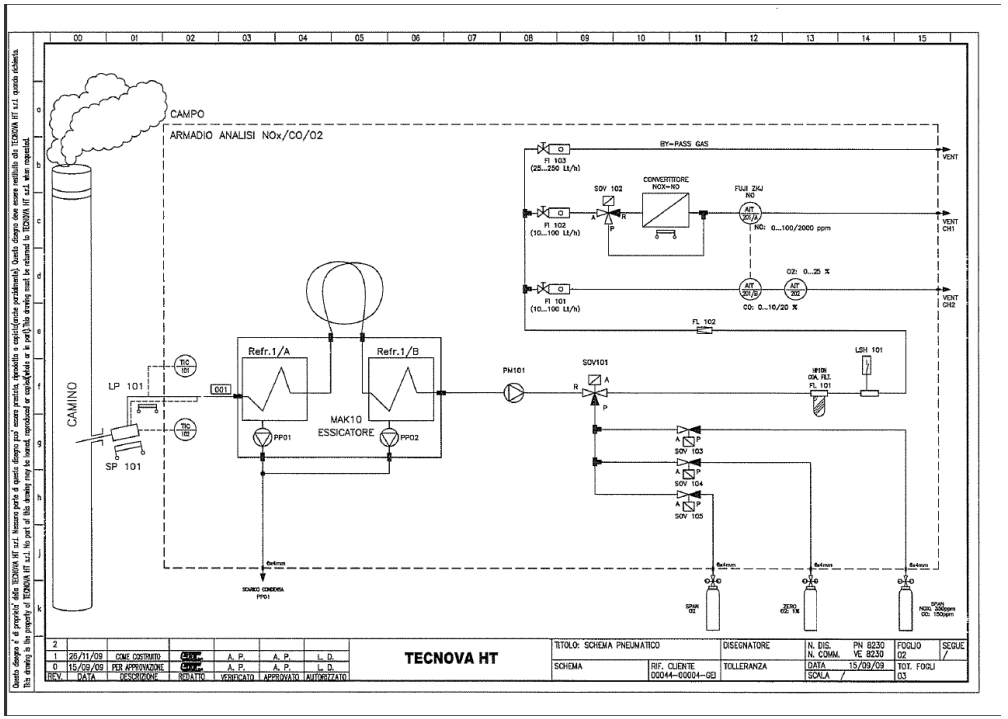
NOTE:

	07/08/2009				
Rev	Data / *Date*	Descrizione / *Description*	Prep	Contr / *Check*	Appr

TYPICAL SYSTEM CONFIGURATION AND CERTIFICATES-

♦ The CEMS configuration system consists of a sample probe, filter, sampling heated line, conditioning system, calibrations gas system , a series of gas analyzers which reflect the parameters being monitored and data aquisition systems

♦All components will be selected according to the specific application and process conditions as per customer inquiry plus configuration data sheets filled-in.



♦Certificates are according to local authorities

Umwelt Bundes Amt
For our Environment

TÜVRheinland®
Precisely Right.

CERTIFICATE

about Product Conformity (QAL1)

Number of Certificate: 0000025931

Certified AMS:	ZRE and ZRE/ZFK7 for CO, NO, SO_2 and O_2
Manufacturer:	Fuji Electric Systems Co., Ltd. No. 1, Fuji-machi, Hino-city Tokyo 191-8502 Japan
Test Institute:	TÜV Rheinland Immissionsschutz und Energiesysteme GmbH

This is certifying that the AMS has been tested and found to comply with:

EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007 and EN 14181: 2004

Certification is awarded in respect of the conditions stated in this certificate (see also the following pages).

www.tuv.com TÜVRheinland® ID: 0000025931

- EN 15267-3 tested
- QAL1 certified
- TUV approved
- Annual Inspection

Publication in the German Federal Gazette (BAnz.) of 2010-02-12

The certificate is valid until: 2015-02-11

Umweltbundesamt

Dessau, 2010-03-15

i. A. Dr. Hans-Joachim Hummel

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH

Köln, 2010-03-10

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Accreditation according to EN ISO/IEC 17025 and ISO 9001:2000.

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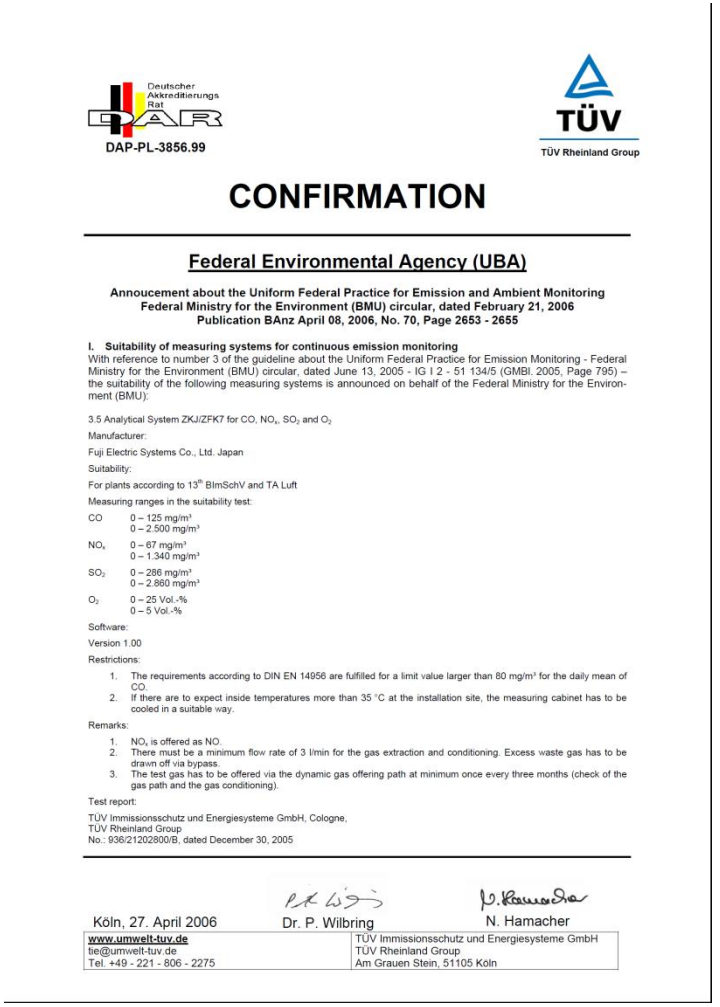

Deutscher Akkreditierungs Rat
DAP-PL-3856.99

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CONFIRMATION

Federal Environmental Agency (UBA)

Annoucement about the Uniform Federal Practice for Emission and Ambient Monitoring
Federal Ministry for the Environment (BMU) circular, dated February 21, 2006
Publication BAnz April 08, 2006, No. 70, Page 2653 - 2655

I. Suitability of measuring systems for continuous emission monitoring

With reference to number 3 of the guideline about the Uniform Federal Practice for Emission Monitoring - Federal Ministry for the Environment (BMU) circular, dated June 13, 2005 - IG I 2 - 51 134/5 (GMBl. 2005, Page 795) – the suitability of the following measuring systems is announced on behalf of the Federal Ministry for the Environment (BMU):

3.5 Analytical System ZKJ/ZFK7 for CO, NO_x, SO_2 and O_2

Manufacturer:

Fuji Electric Systems Co., Ltd. Japan

Suitability:

For plants according to 13th BImSchV and TA Luft

Measuring ranges in the suitability test:

CO	0 – 125 mg/m³ 0 – 2.500 mg/m³
NO_x	0 – 67 mg/m³ 0 – 1.340 mg/m³
SO_2	0 – 286 mg/m³ 0 – 2.860 mg/m³
O_2	0 – 25 Vol.-% 0 – 5 Vol.-%

Software:

Version 1.00

Restrictions:

1. The requirements according to DIN EN 14956 are fulfilled for a limit value larger than 80 mg/m³ for the daily mean of CO.
2. If there are to expect inside temperatures more than 35 °C at the installation site, the measuring cabinet has to be cooled in a suitable way.

Remarks:

1. NO_x is offered as NO.
2. There must be a minimum flow rate of 3 l/min for the gas extraction and conditioning. Excess waste gas has to be drawn off via bypass.
3. The test gas has to be offered via the dynamic gas offering path at minimum once every three months (check of the gas path and the gas conditioning).

Test report:

TÜV Immissionsschutz und Energiesysteme GmbH, Cologne,
TÜV Rheinland Group
No.: 936/21202800/B, dated December 30, 2005

Köln, 27. April 2006

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- TYPICAL TECNOVA HT PROPOSAL-

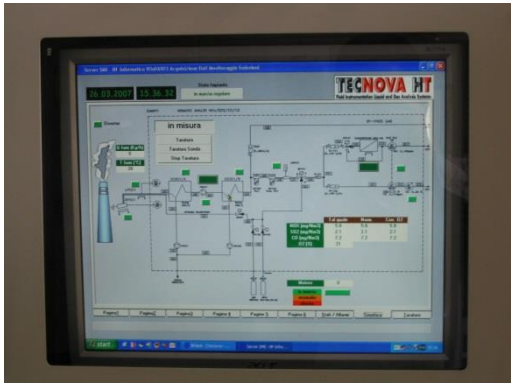
♦ Introduction describing the technology and analyzers selected with components under measurement.
♦Description of selected shelter and/or cabinet suitable for enviromental condition available also with ATEX approval
♦Description of all sampling system components
♦Description of all analyzers required to cover all data under process, strictly certified TUV and QAL1
♦Description of calibration system
♦Description of field instruments (if required)
♦Description of software and harware for data acquisition and management
♦Description of all services and documents included (stat up/ FAT/ Training/ Manuals ect)
♦Complete definition of scope of supply and its limits

- PROJECT IMPLEMENTATION-

♦ Assignement of Project Manager responsible for overall implementation and Project Engineer for technical development.
♦Kick-off meeting to define final technical specifications and system configuration.
♦System assembly procedure and realization
♦Factory acceptance test by Tecnova HT and, if required, by customer
♦Inspection and approval by third party company if required
♦Standard or special packaging and delivery terms as per customer instructions
♦Service on site

- MAJOR INSTALLATION PICTURES-

Eni Taranto Refinery



IBP Biohetanol plant

- MAJOR INSTALLATION PICTURES-

SNET Gardanne Coal Power station

GDF Suez 400MW Power station

- MAJOR REFERENCE LIST OF CEMS INSTALLATIONS -

- **Alstom Power- AES-** Coal power station- Bulgaria.
- **Alstom Power-SNET-** Coal power station- France
- **Idreco-ENDESA**- Coal power station- Spain
- **Foridus**- steel mill plant- Singapore
- **ENI**- refinery/thermal power station- Italy
- **IBP**- Bioethanol plant (largest in europe)-Italy
- **EDF-Fenice**- Power Station- Italy
- **O-I**- Glass factory- Italy
- **GDF Suez**- 400 MW power station- Italy
- **CPCU-** power station- France
- **Techint**- Furnace emission- Qatar
- **Europower**- Incinerator – Italy
- **Hellenic Petroleum**-Refinery- Greece
- **ITAS**- Chemical plant- Iran
- **Donau Carbon**- Cement plant- Belgium