



Title <b>CEMS – Technical specification</b>		Document No. <b>0058F0VVHI608</b>		Rev. <b>01</b>	Page <b>1</b>	of <b>24</b>	
		Volume N.		IP Classification		Internal only	
Doc. classification <b>DSP</b>	Owning Group <b>1AP</b>	Language <b>English</b>	Derived from <b>0058F0VVHI60801</b>	Rev. <b>01</b>	Replace	Rev.	
Project code <b>0058</b>	Project <b>FUSINA CAPACITY MARKET ITALY</b>		Client <b>ENEL PRODUZIONE S.p.A.</b>				
SUPERVISION OUTCOME <i>Esito Supervisione</i>							
<b>01</b>		<b>ES</b>					
REV	DATE <i>Data</i>	Issue <i>Scope</i>	SUPERVISED <i>Esaminato</i>	CO-OPERATIONS <i>COLLABORAZIONI</i>		APPROVED <i>Approvato</i>	ISSUED <i>Emesso</i>
			Document no / Documento <b>PBCFU52431</b>			Security Index <i>Indice Sicurezza</i>	
						<b>Internal Use / P</b>	
ENEL - E&C submittal <i>Inoltra a ENEL - E&amp;C</i>		<input type="checkbox"/>	FOR APPROVAL <i>Per</i>	<input checked="" type="checkbox"/>	FOR INFORMATION <i>Per informazione</i>	<input type="checkbox"/>	NOT REQUESTED
SYSTEM <i>Sistema</i>	<b>VVH</b>	APPL. TO SECT.	DOC. TYPE <b>ST</b>	DISCIPLINE <i>Disciplina</i>	<b>S</b>	FILE <i>PBCFU5243101</i>	
L'approvazione di ENEL-E&C è limitata agli aspetti relativi alle prescrizioni contrattuali, rimangono pertanto a carico del Fornitore tutte le responsabilità della progettazione.				The ENEL-E&C approval refers to <sup>File</sup> contractual requirements and clauses only. All design responsibilities remain charged to the Supplier.			
PROJECT <i>Progetto</i>	<b>FUSINA – CAPACITY MARKET ITALY</b>						
CLIENT <i>Cliente</i>	<b>ENEL PRODUZIONE S.p.A.</b>						
JOB no :	Doc. no. ----						
CLIENT SUBMITTAL <i>Inoltra al Cliente</i>	<input type="checkbox"/>	FOR APPROVAL <i>Per approvazione</i>	<input checked="" type="checkbox"/>	FOR INFORMATION <i>Per informazione</i>	<input type="checkbox"/>	NOT REQUESTED <i>Non richiesto</i>	
<b>1</b>	<b>I</b>	Marco Ferrari RC-IT PA AP MI PM	Alessandro Qualizza RC-IT PA AP MI PM	Alessandro Qualizza RC-IT PA AP MI PM	F. Provenzano Ansaldo	<b>10/03/2023</b>	
<b>0</b>	<b>I</b>	Marco Ferrari RC-IT PA AP MI PM	Alessandro Qualizza RC-IT PA AP MI PM	Alessandro Qualizza RC-IT PA AP MI PM	Mattia D'amato Ansaldo	<b>18/11/2022</b>	
Rev	Client Involvement	Authors	Controllers	Verifiers	Approver	Date	

Project / Title  <b>FUSINA – CAPACITY MARKET ITALY CEMS – Technical Specification</b>	Document No.  <b>0058F0VVHI608 PCBCFU52431</b>	Rev.	Page	of
		<b>1</b>	<b>2</b>	<b>24</b>
		IP Classification	Internal only	

## INDEX

INDEX .....	2
Sample probe .....	3
Sample transport line.....	3
Sample conditioning system .....	3
<b>Sample gas cooler</b> .....	3
<b>Sample suction pump</b> .....	4
<b>Fine filter</b> .....	4
<b>Calibration solenoid valve</b> .....	4
CEMS Analyzers .....	6
<b>Extractive analyzers</b> .....	6
<b>Siprocess UV600</b> .....	6
<b>NOX CONVERTER</b> .....	7
<b>LDS 6 Laser analyzer</b> .....	8
<b>Analyzer’s sensor</b> .....	10
<b>Control unit</b> .....	10
<b>Connection cables</b> .....	12
<b>Analysis system cabinet</b> .....	14
<b>Digital and analogue wired output of the system to DCS</b> .....	15
<b>Data Acquisition Handling System</b> .....	16
<b>PLC Hardware</b> .....	16
<b>DAHS computer Local PC</b> .....	17
<b>Data acquisition Software SICEMS</b> .....	18
<b>Synoptic</b> .....	21
<b>Charts</b> .....	22
<b>Data</b> .....	22
<b>Reports</b> .....	22
<b>Diagnostics</b> .....	23
<b>QAL3</b> .....	23

Project / Title  <b>FUSINA – CAPACITY MARKET ITALY CEMS – Technical Specification</b>	Document No.  <b>0058ANKKSDNNN PCBCFU5231</b>	Rev.	Page	of
		<b>1</b>	<b>8</b>	<b>24</b>
		IP Classification	Internal only	

Power supply: 200 ... 240 V, 48 ... 63 Hz Hz. 40 ... 70 VA for safe area.  
 Enclosure design: rack 19" mount/ 4 U.  
 Degree of protection: IP 20.  
 Sample gas flow: 18 ... 90 l/h  
 Pneumatic connection: 6 mm.  
 Accessories: Flowmeter with low flow alarm.  
 Digital output board for automatic calibration.  
 Note: Single instrument for measurement during transient and during normal operation.

**Oximat 6**

Analyzer model OXYMAT 6 TÜV (QAL 1) certified as per 13<sup>a</sup> / 17<sup>a</sup> BImSchV and TA LUFT for the measurements of oxygen.  
 OXYMAT 6 works under the paramagnetic principle, the oxygen molecules in an inhomogeneous magnetic field are drawn in the direction of increased field strength due to their paramagnetism. When two gases with different oxygen concentrations meet in a magnetic field, a pressure difference is produced between them. In order to obtain this oxygen concentration difference and so a pressure difference the analyzer require a a reference gas (nitrogen or air). The magnetic field is alternate type, making so the pressure difference invert itself at each field change, it generates a flow, measured by a microflow sensor that give a signal proportional to the oxygen concentration. The proposed analyzer has the following technical characteristics:

Measuring principle: paramagnetic (PRM)  
 Measured component: oxygen (O2)  
 Full scale: 0 ... 25 % Vol.  
 Measurement full scale: 4 for each measured component  
 Electronic: digital microprocessor based  
 Display: backlight, alphanumeric LCD type, for display of measured value, status line, measuring ranges  
 Control panel: membrane touch pad with softkeys  
 Menu: driven for configuration, tests and calibration  
 Auto diagnostic: with failure alarm  
 Analog output: 0 / 4 ... 20 mA floating  
 Data interface: RS 485  
 Power supply: 200 ... 240 V, 48 ... 63 Hz Hz. 70 VA  
 Enclosure design: rack 19" mount/ 4 U  
 Degree of protection: IP 20.  
 Sample gas flow: 18 ... 60 l/h  
 Reference gas: air by external pump included in our supply.  
 Pneumatic connection: 6 mm.  
 Accessories: Flowmeter with low flow alarm.  
 Digital output board for automatic calibration.

**LDS 6 Laser analyzer**

Diode laser gas analyzer model LDS 6 suitable to measure chemical gaseous components like as hydrogen chloride, hydrogen fluoride (HF), ammonia (NH3), carbon monoxide (CO), carbon

Project / Title  <b>FUSINA – CAPACITY MARKET ITALY CEMS – Technical Specification</b>	Document No.  <b>0058ANKKSDNNN PCBCFU5231</b>	Rev.	Page	of
		<b>1</b>	<b>9</b>	<b>24</b>
		IP Classification	Internal only	

dioxide (CO<sub>2</sub>), oxygen (O<sub>2</sub>) and water (H<sub>2</sub>O). Its measuring principle is based on the specific light absorption of different gas components.

The analyzer is used for non extractive (the two sensors could be placed directly on the duct or stack in which the sample flows) measurements of gaseous concentration or temperature.

Each control unit could manage up three couple of sensors that measure in every case the same chemical component.

The maximum distance between the control unit and the sensors could be up to 700 meters.

The sensors are designed to work in harsh conditions and upon request a hazardous area configuration is available.

The main characteristics of the proposed analyzer are the following:

Measuring principle:	laser
Laser Protection:	Class 1 safe to the eye
Measured component:	Water vapor (H <sub>2</sub> O) and NH <sub>3</sub>
Full scale:	0 ... 30 % Vol.
	0... 12,5mg/m <sup>3</sup>
TÜV certification:	QAL1

The analyzer is composed of the following main components.

- n. 1 central unit,
- n. 1 couple of sensors,
- n. 1 set of cables,
- n. 1 alignment kit,

Project / Title  <b>FUSINA – CAPACITY MARKET ITALY CEMS – Technical Specification</b>	Document No.  <b>0058ANKKSDNNN PCBCFU5231</b>	Rev.	Page	of
		<b>1</b>	<b>10</b>	<b>24</b>
		IP Classification	Internal only	

## Analyzer's sensor

Couple of sensors developed for "in situ" application composed of one transmit and one receiver unit connected together and both to the central unit. Each sensor is a single measuring point (channel) and it is possible connect up to 3 couples of sensors (for the measurements of the same component) to each central unit.

Sensor material:	stainless steel
Installation:	horizontally to the optical axis, perpendicular or parallel to the gas flow
Measurements path:	0,3 .... 12 m (other length on request)
Sample temperature:	- 5 ... + 1200° C. (application dependent)
Sample pressure:	standard 1013 ± 50 hPa (other pressure on request).
Dust load:	up to a 100 g/Nm <sup>3</sup>
Process connection:	DN 65 PN6 flanges (sample tap at your care).
Ex protection:	safe area
Degree of protection:	IP 65
Ambient temperature:	- 30 ... + 70° C.
Ambient pressure:	800 ... 1100 hPa
Purge system:	required
	purging sensor side: air <sup>(1)</sup>
	purging, process side: air <sup>(1)</sup>
	flow sensor side: 1 ... 2 l/min.
	flow, process side: 0 ... 120 l/min.
	purge gas pressure: 2000 ... 8000 hPa.
	<sup>(1)</sup> Purge gas quality:
	Air free from oil and water (< - 80 ° C. for trace moisture measurements only).
	Nitrogen 99,7 % purity, dewpoint < -10° C. (- 80° C to measure trace of water / to measure oxygen: oxygen content < 0,01 %, with optical path length of 1 m and 5 % oxygen content in sample).

## Control unit

Central unit for LDS 6 sensors suitable for safe area installation, to manage, configure sensors and display measurements.

Electronic:	digital microprocessor based
Display:	backlight, alphanumeric LCD type, for display of measured value and status,
Control panel:	membrane touch pad with softkeys
Menu:	driven for parameterization, test, calibration and diagnostics.
Auto diagnostic:	with failure alarm
Emitter laser light:	placed inside the control unit housing with electronic driver
Calibration:	integrated self calibration with internal calibration cell
Sensors:	connection possible with up to 3 sensors for the measurements of the same component

Project / Title  <b>FUSINA – CAPACITY MARKET ITALY CEMS – Technical Specification</b>	Document No.  <b>0058ANKKSDNNN PCBCFU5231</b>	Rev.	Page	of
		<b>1</b>	<b>11</b>	<b>24</b>
		IP Classification	Internal only	

Analog output: n. 2, 4 ... 20 mA per channel  
 Digital output: n. 6, 24 V AC /DC 1 A, freely configurable binary inputs  
 Data interface: Ethernet 10BaseT (RJ45)  
 Power supply: 100 ... 240 V, 50 - 60 Hz, 50 VA (with 3 channel central unit an additional external power supply 24 V DC, 50 VA is required)  
 Enclosure design: 19" rack / 4 U  
 Degree of protection: IP 20 for safe area installation.