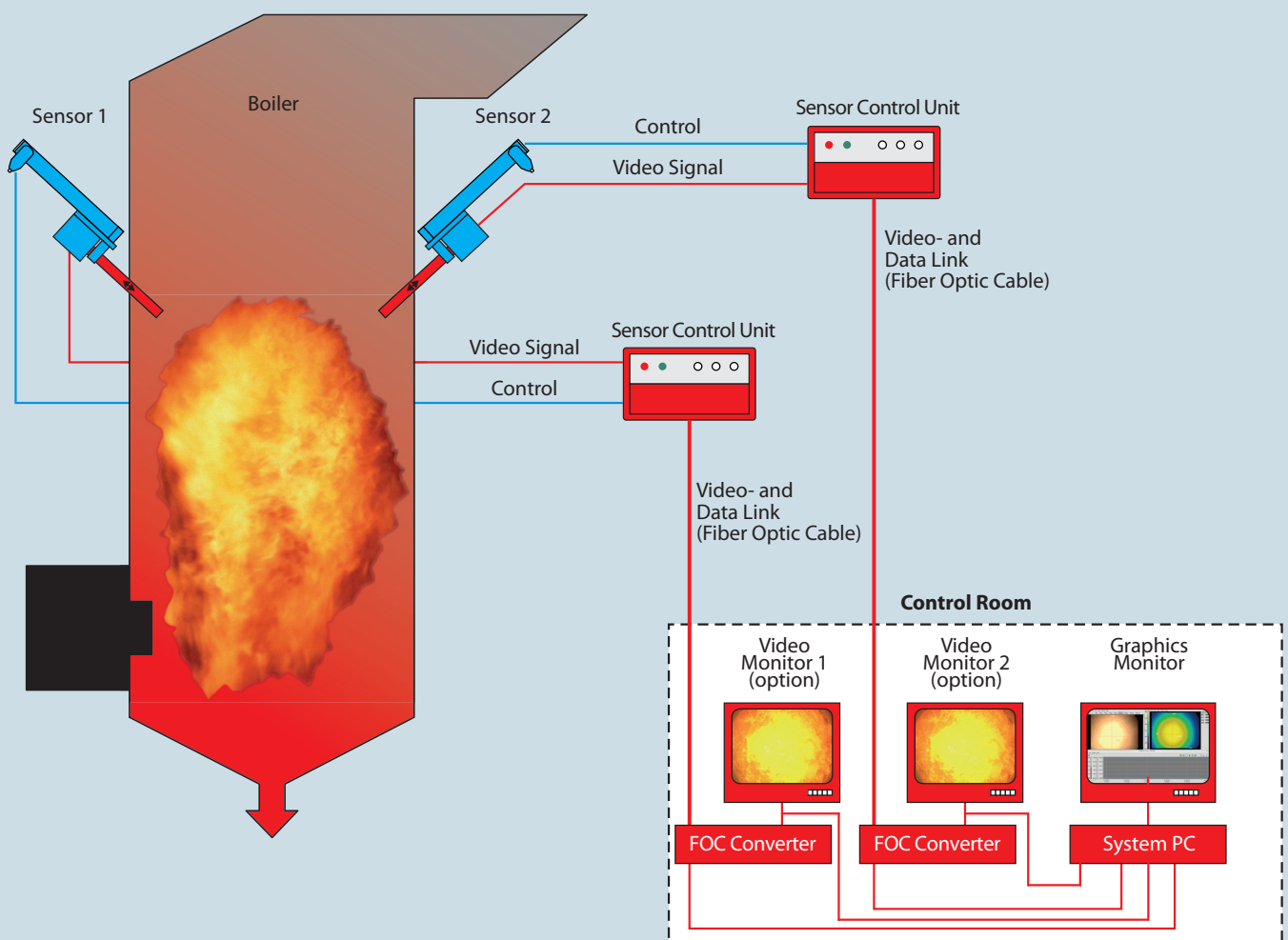


# D-VTA 200

## Video-based Thermography for Combustion Processes



# Video Monitoring

## The Video-based D-VTA 200 Thermography System

is a modular system for monitoring industrial high temperature processes. Intelligent sensors allow contactless, optical and thermal online analysis of processes in the combustion chamber. Applications include:

- Detection of the Temperature Distribution in side combustion chambers; analysis of unbalanced combustion processes
- Burning analysis and slag monitoring in power plants
- Visualization of flame post combustion chambers and flame front monitoring in waste incineration plants
- Visualization and temperature distribution analysis of grate based firing systems, f.e. biomass and co-firing
- Monitoring ore calcination and hazardous waste disposal in the chemical industry
- Annealing and pusher furnace monitoring in the steel industry
- Scale formation and melting charge control in the glass industry.

## The Sensors

have been specially developed for the harsh working conditions in industrial combustions. The sensor housing contains the special boroscope as optical system, or the videoscope and the industrial CCD camera. In this design all electronic components are operated outside the combustion area, in the cooled camera housing. The slim, air or water-cooled sensor shaft ( $\varnothing$  43mm) minimises the mechanical stress (abrasive dust) and the thermal influence on the sensor parts in the combustion chamber. The optical system is protected against mechanical and thermal damage by a sapphire lens at the sensor tip, in addition to air flushing. As no moving parts (no mirrors, prisms or motors) are located in the process-oriented area, the sensors achieve a high availability with minimum service requirement.



Waste Incineration Plant

## The Field Components

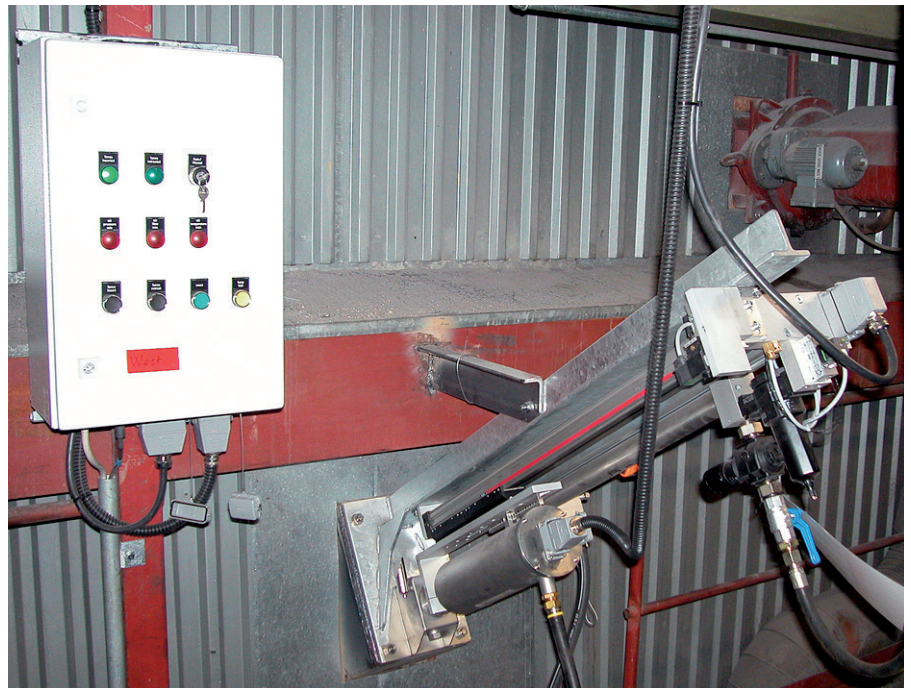
- Pneumatically operated retraction system with monitoring units for the cooling and flushing media, including integrated air accumulator
- Sensor Control Unit for control of the sensors, signal processing for the data and video transmission via fibre-optic cable to the control room.

## The Control Room Equipment

- Linux based system computer for temperature calculation, thermography presentation
- Video monitor for online colour display
- FOC / Data Converter  
optional: Quadsplitter & Crossbars

## The Video System

The basic system comprises the above-mentioned system components, without system computer. It enables visual monitoring through real-time colour video display.



Sensor with Retraction Unit



Power Plant

# Thermography

## The Thermography Analysis System

The thermography system comprises the components of the video system plus the system computer with software modules. It operates as a spatial optical pyrometer on the basis of image data processing and offers, in addition to the video system:

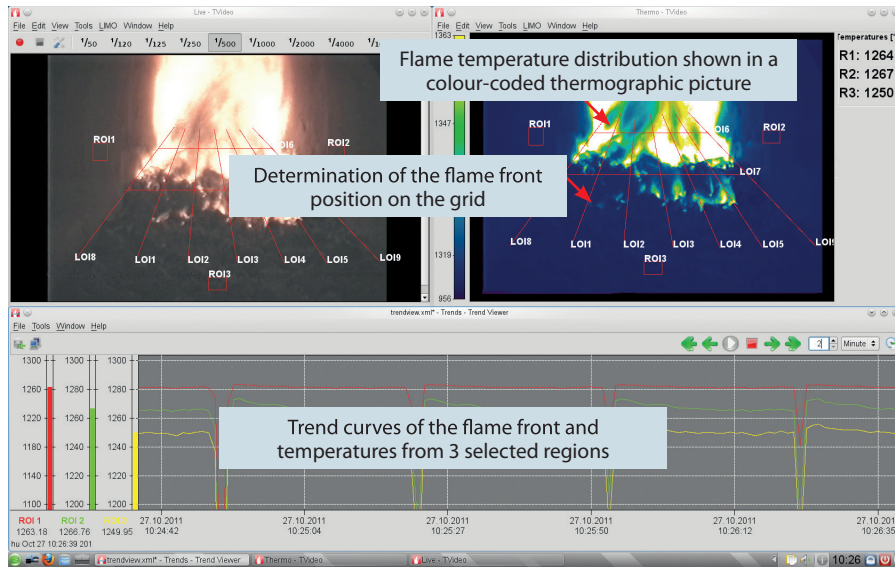
- Temperature determination of each visible image point of the video sensor
- Thermal analysis of the local temperature distribution
- Temperature definition within freely definable measuring window and lines (ROI = Region of Interest / LOI = Line Of Interest).
- Analysis of thermal samples to identify anomalies in the combustion process

All data of the thermography system can be transmitted to the process control system via a standardized data interface.

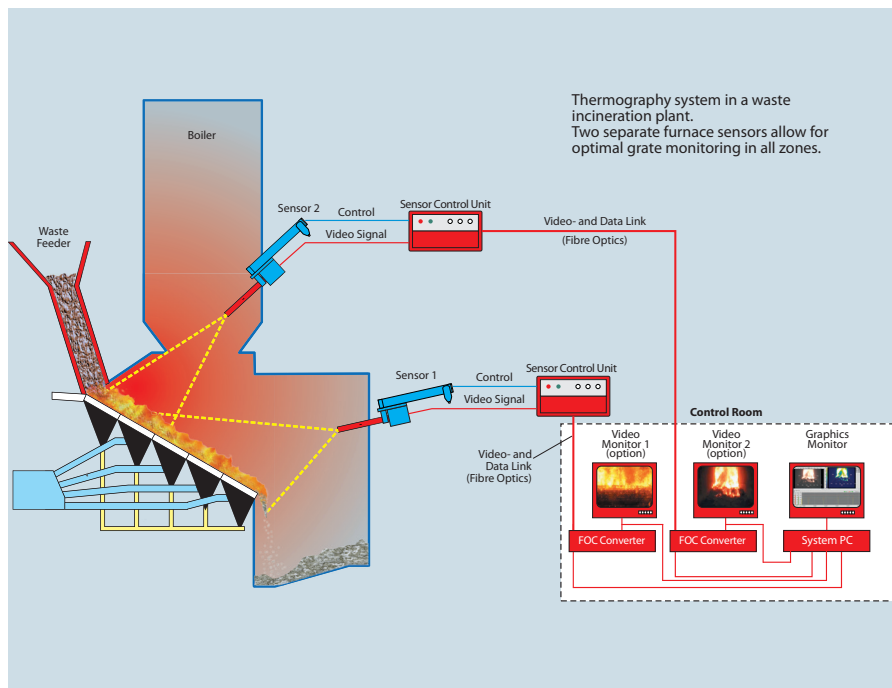


Chemical &amp; Petrochemical Industry

# Analysis System



Thermography screen (waste incineration plant)



D-VTA 200 System in a Waste Incineration Plant



Steel Industry



Biomass Plants



Glas Industry

## Technical Data

<b>Video system</b>	PAL, picture elements: 752(H) x 582(V), fixed focus
<b>Thermography from total radiation</b>	Temperature range 1000°C – 2000°C
<b>Optical alignment</b>	Sensor 0°: axially-parallel to sensor axis; Sensor 45°: angled 45° to sensor axis
<b>Optical field of view</b>	Sensor 0°: horizontal 72°, vertical 54°, diagonal 90°; Sensor 45°: horizontal 48°, vertical 36°, diagonal 60°
<b>Data interfaces on the system PC</b>	Modbus RTU Modbus TCP/IP Profibus DP
<b>Auxiliary energy</b>	100...240 V / 50...60 Hz, 500 VA
<b>Gas temperature in combustion chamber</b>	Water-cooled sensor <2000°C
<b>Ambient temperature</b>	Sensor / Retraction: 0°C...60°C, Sensor Control Unit: -10°C ... +55°C
<b>Material</b>	Sensor: stainless steel 1.4571 / 1.4301, Sensor Control Unit: steel sheet, painted in RAL 7035
<b>Dimensions / Weights</b>	Diameter of sensor tip: water-cooled 43 mm
<b>Immersion depth in combustion chamber</b>	max. 450 mm from welding plate, different lengths on request
<b>Space requirement for sensor / retraction device</b>	1450 x 500 x 800 mm (LxWxH)
<b>System Control Unit</b>	600 x 380 x 210 mm (HxWxD)
<b>Cable length</b>	Sensor/Retraction – Sensor Control Unit 14 m
<b>Connection Site / Control Room</b>	Optical Fiber, max. 1000 m
<b>System PC</b>	19" industrial housing, 4 HE, depth 450 mm
<b>Weights</b>	Sensor with retraction and carrier 70 kg, Sensor Control Unit 15 kg
<b>Cooling water volume</b>	350 l/h, 2.5...8 barg
<b>Cooling water temperature</b>	Inlet: <45°C, Outlet: Temperature increase <10° C
<b>Cooling water quality</b>	Clean, chemically neutral, non-corrosive, Hardness: <5°dH / <28 mMol/l pH-Value 4 ... 8,5
<b>Compressed air volume</b>	25 Nm³/h
<b>Compressed air pressure</b>	5 – 8 barg
<b>Compressed air temperature</b>	5...40°C
<b>Compressed air quality</b>	dry, free from dust, aerosols, oil quality





**DURAG Sales and Marketing GmbH & Co. KG**  
Kollaustraße 105  
22453 Hamburg, Germany  
Tel. +49 40 55 42 18-0  
Fax +49 40 58 41 54  
E-Mail: info@durag.de

**DURAG Niederlassung Nord**  
Kollaustraße 105  
22453 Hamburg, Germany  
Tel. +49 40 55 42 18-0  
Fax +49 40 58 41 54  
E-Mail: durag-nord@durag.de

**DURAG Niederlassung West**  
An der Pönt 53a  
40885 Ratingen, Germany  
Tel. +49 2102 74 00-0  
Fax +49 2102 74 00 28  
E-Mail: durag-west@durag.de

**DURAG Niederlassung Süd**  
Weidenweg 16  
73087 Bad Boll, Germany  
Tel. +49 7164 912 25-0  
Fax +49 7164 912 25-50  
E-Mail: durag-sued@durag.de

**DURAG Niederlassung Ost**  
Halsbrücker Straße 34  
09599 Freiberg, Germany  
Tel. +49 3731 30 04-0  
Fax +49 3731 30 04-22  
E-Mail: durag-ost@durag.de

## DURAG

**DURAG GmbH**  
Kollaustraße 105  
22453 Hamburg, Germany  
Tel. +49 40 55 42 18-0  
Fax +49 40 58 41 54  
E-Mail: info@durag.de



**DURAG data systems GmbH**  
Kollaustraße 105,  
22453 Hamburg, Germany  
Tel. +49 40 55 42 18-3000  
Fax +49 40 55 42 18-3099  
E-Mail: info@durag-data.de



**DURAG process & systems technology gmbh**  
Kollaustraße 105  
22453 Hamburg, Germany  
Tel. +49 40 55 42 18-0  
Fax +49 40 58 41 54  
E-Mail: info@durag-process.de



**DURAG Siena do Brasil Ltda**  
Rua Vinte e Dois de Agosto, 66  
Diadema - SP  
09941-530 Brazil  
Tel. +55 11 4071-5050 r.28  
Fax +55 11 4077-1718  
E-Mail: info@duragsiena.com.br



**Hegwein GmbH**  
Am Boschwerk 7  
70469 Stuttgart  
Germany  
Tel. +49 711 135 788-0  
Fax +49 711 135 788-5  
E-Mail: info@hegwein.de



**SMITSVONK Holland B.V.**  
P.O. Box 180, 2700 AD Zoetermeer  
Goudstraat 6, 2718 RC Zoetermeer  
Netherlands  
Tel. +31 79 361 35 33  
Fax +31 79 361 13 78  
E-Mail: sales@smitsvonk.nl



**A Brand of DURAG GmbH**  
Kollaustraße 105  
22453 Hamburg, Germany  
Tel. +49 40 55 42 18-0  
Fax +49 40 58 41 54  
E-Mail: verewa@durag.de

**DURAG Brazil**  
DURAG Siena do Brasil Ltda  
Rua Vinte e Dois de Agosto, 66  
Diadema - SP  
09941-530 Brazil  
Tel. +55 11 4071-5050 r.28  
Fax +55 11 4077-1718  
E-Mail: info@duragsiena.com.br

**DURAG France S.a.r.l.**  
Parc GIP Charles de Gaulle  
49, rue Léonard de Vinci, BP 70166  
95691 Goussainville CEDEX,  
France  
Tel. +33 1 301 811 80  
Fax +33 1 393 383 60  
E-Mail: info@durag-france.fr

**DURAG, Inc., USA**  
1355 Mendota Heights Road  
Suite 200  
Mendota Heights  
MN 55120, USA  
Tel. +1 651 451-1710  
Fax +1 651 457-7684  
E-Mail: durag@durag.com

**DURAG India Instrumentation Private Limited**  
#27/30, 2nd Main Road  
Industrial Town, Rajajinagar  
Bengaluru 560 044, India  
Tel. +91 80 2314 5626 / 4215 1191  
Fax +91 80 2314 5627  
E-Mail: info@duragindia.com

**DURAG Instrumentation (Shanghai) Co., Ltd.**  
Room 706, Dibao Plaza, No. 3998  
Hongxin Rd., Minhang District,  
Shanghai, 201103 PR China  
Tel. +86 21 60732979-206  
Fax +86 21 60732980  
E-Mail: info@durag-cn.com

**DURAG Italia S.r.l.**  
Via Carlo Panseri, 118  
CIM uffici, P. secondo  
28100 Novara  
Italy  
Tel. +39 0321 679569  
Fax +39 0321 474165  
E-Mail: info@durag.it

**DURAG Japan Office**  
c/o TMS Planning Inc.  
291-2 Umena, Mishima-shi,  
Shizuoka-ken,  
411-0816 Japan  
Tel. +81 55 977 3994  
Fax +81 55 977 3994  
E-Mail: info@durag.jp

**DURAG Korea Office**  
RM #1131, Manhattan Building,  
36-2, Yeouido-Dong,  
Yeongdeungpo-Gu, Seoul,  
Korea  
Tel. +82 2 761 8970  
Fax +82 2 761 8971  
E-Mail: info@durag-group.co.kr

**DURAG RUSS OOO**  
Andropova avenue 18/6,  
Office 5-09  
115432 Moscow  
Russia  
Tel. +7 499 4180090  
Fax +7 499 4180091  
E-Mail: info@durag-group.ru

**DURAG UK GmbH**  
Lullington House, Ashby Road  
Burton-on-Trent, Staffordshire,  
E15 0YZ  
Great Britain  
Tel. +44 1283 553 481  
Fax +44 1785 760 014  
E-Mail: durag.uk@durag.de

[www.durag.de](http://www.durag.de)