PYROINC 768N

High-Resolution IR Camera for Combustion Chambers for Temperature Measurements from

600 °C to 1800 °C
The PYROINC 768N camera for combustion chambers is a special and very robust infrared camera that is used for the measurement of high temperatures between 600 °C and 1800 °C.

It has a motorfocus borescope lens with a sapphire protection window. The camera and the borescope lens are installed in a watercooled stainless steel probe cooling jacket. The inlet for the IR radiation has a very small diameter and it is airpurged. In this way, the probe cooling jacket can be pulled directly through the opening in the combustion chamber walls. Together with the automatic retraction system it is guaranteed that the system withstands the high temperatures and special requirements of the location. The front part of the probe cooling jacket is able to resist temperatures about 1800 °C with a service life between 2 and 10 years (depending on the operating conditions).

The camera measures within the spectral range from 0.8 µm to 1.1 µm. The used silicon-based high-dynamic image sensor enables a large continuous measuring temperature range. For the visualization and processing of the measured data the thermal images are transferred in real-time via Ethernet.

The device version PYROINC 768N endoscope has a diameter of only 36 mm in the front part. It uses either an air cooling or a water cooling.
# PYROINC 768N

High-Resolution IR Camera for Combustion Chambers

## Technical data

<table>
<thead>
<tr>
<th></th>
<th>PYROINC 768N</th>
<th>PYROINC 768N endoscope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral range</td>
<td>0.8 µm to 1.1 µm</td>
<td></td>
</tr>
<tr>
<td>Measuring temperature ranges</td>
<td>600 °C to 1500 °C or 800 °C to 1800 °C (one range)</td>
<td>800 °C to 1800 °C</td>
</tr>
<tr>
<td>Sensor</td>
<td>uncooled 2D-Si-CMOS array (768 × 576 Pixel)</td>
<td></td>
</tr>
<tr>
<td>Optics</td>
<td>Angle of aperture 74° × 59°, measurement distance &gt; 1 m, spatial resolution 1.7 mrad, motor focus</td>
<td></td>
</tr>
<tr>
<td>Measurement uncertainty</td>
<td>2 % of measured value in °C</td>
<td></td>
</tr>
<tr>
<td>NETD</td>
<td>&lt; 1 K (Measuring range beginning, 50 Hz)</td>
<td></td>
</tr>
<tr>
<td>Measurement frequency</td>
<td>Internal 50 Hz, selectable: 50 Hz, 25 Hz, 12.5 Hz, ...</td>
<td></td>
</tr>
<tr>
<td>Response time</td>
<td>Internal 40 ms, selectable: 2/measurement frequency</td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Ethernet (real-time, 50 Hz), each two galvanically isolated digital inputs and digital outputs</td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>HAN Modular (operating voltage, digital inputs and outputs, Ethernet)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 15 kg</td>
<td></td>
</tr>
<tr>
<td>Auxiliary energy</td>
<td>12 V to 36 V DC, typical 7 ... 10 VA</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>Stainless steel housing, length = 1040 mm, Ø 114 mm (air cooling), Ø 104 mm (water cooling)</td>
<td>Stainless steel housing, length 1607 mm, Ø 36 mm (Air cooling or water cooling)</td>
</tr>
<tr>
<td>Operating temperature of the camera module</td>
<td>−10 °C to 55 °C (internal instrument temperature)</td>
<td></td>
</tr>
<tr>
<td>Storage conditions</td>
<td>−20 °C to 70 °C, max. 95 % relative humidity</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>PC control and display program PYROSOFT for Windows®, customized version on request</td>
<td></td>
</tr>
</tbody>
</table>

1 Others on request. 2 Specifications for black body radiators and ambience temperature 25 °C. 3 % of measured value in °C (object temperatures > 1400 °C). 4 Noise equivalent temperature difference.

## Dimensional drawings

PYROINC 768N

1. Borescope
2. Water drain
3. Harting Modular plug
4. Purge air connector SW 19
5. Water inlet

PYROINC 768N endoscope

## Optics

<table>
<thead>
<tr>
<th>HFOV × VFOV</th>
<th>M [m]</th>
<th>W [m]</th>
<th>H [m]</th>
<th>w [mm]</th>
<th>h [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFOV</td>
<td>74° × 59°</td>
<td>1</td>
<td>1.5</td>
<td>1.1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>4.5</td>
<td>3.4</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>15</td>
<td>11</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

HFOV ... Horizontal Field Of View  
VFOV ... Vertical Field Of View  
IFOV ... Instantaneous Field Of View  
M ... Measurement distance  
b ... Image width  
H ... Image height  
b ... Pixel width  
h ... Pixel height
PYROSOFT

Powerful online and offline software for DIAS infrared cameras

PYROSOFT Compact

- Online data acquisition of one DIAS infrared camera
- Open and edit archived measured data and sequences
- Bitmap and video export
- Online data storage and online bitmap export
- Definition of regions of interests (ROI): points, lines and rectangle
- Generating of reports in Microsoft® Word format by integrated report function
- Context-sensitive help system (F1 key)
- Included in the scope of delivery of every PYROVIEW infrared camera

PYROSOFT Professional

- Online data acquisition – Analyze, store and export data in real-time
- Open and edit archived measured data and sequences
- Multi document structure for several documents
- Bitmap, video and text export
- Definition of regions of interests (ROI) and values of interests (VOI) with alarm calculation, histogram and trend chart
- Numerous interface possibilities for processes (PROFIBUS, PROFINET, WAGO, TCP-Socket, Text IO)
- Reporting function, context-sensitive help system (F1 key)
- PYROSOFT Professional IO offers optionally a bidirectional data interface via PROFIBUS, PROFINET, WAGO, MODBUS, OPC, TCP Socket to process control systems, controllers and other applications

PYROSOFT Automation

DIAS has developed the software PYROSOFT Automation for the integration of infrared cameras in automation processes.
- Comfortable product management with free definable document templates
- Product choice and release control can be made manually or automatically
- Different user levels for operator, tool setter and administrator
- Functionality of PYROSOFT Professional for administrators
- Automatic logging of system messages, measured data and alarms
- Easy to use and configurable user interface for application in fabrication
- Learning functions for automatic adjustment of alarm threshold
- Offline viewer for belated data analysis
- Bidirectional data interface via PROFIBUS, PROFINET, WAGO, MODBUS, OPC, TCP Socket to process control systems, controllers and other applications

PYROSOFT DAQ

For users who want to make an integration into their software environment by themselves, we offer an own online and offline DLL interface for DIAS infrared cameras.
- API (DLL) for direct data access under Windows®
- Support for DIAS IRDX file format
- Setting of data acquisition parameters and object properties
- Query of temperature values and camera information
- Functions for displaying of images and palettes as bitmap
- Online and offline function

More software packages are available, for example:
PYROSOFT MultiCam (process software for monitoring up to 8 cameras), PYROSOFT CamZone (software for programming a stand-alone camera), application specific software like PYROSOFT FDS for DIAS fire detection systems.