D-R 290

Optical opacity / dust monitor

New generation

smart solutions for combustion and environment
The new generation D-R 290
Reliable measurements for medium to high concentrations

Features
- Continuous and contactless measurement
- Extremely powerful and stable SWBD LED light source
- New SMD electronics with digital Modbus RTU interface
- Convenient operation with remote access option
- Extremely low-maintenance

Approvals
- Suitability-tested by TUV
- Certified according to DIN EN 15267-3
- MCERTS
- Fully compliant with US EPA 40 CFR 60 PS 1 and ASTM 6216

Contactless measurement according to the transmission principle

The D-R 290 operates using the double-pass method according to the auto-collimation principle. The light beam traverses the measuring path twice. The attenuation of the light beam by the dust content in the measuring section is measured and evaluated.

The light source is a super-wide band diode (SWBD) which provides more stable measurements in comparison to conventional LEDs.

The D-R 290 has an internal zero and reference point check as well as contamination measurement. The contamination is automatically compensated. A maintenance demand is immediately indicated.
**Applications**

- Continuous emission monitoring e.g.
  - on incineration plants
  - on waste incineration plants
  - on power plants
  - on cement plants
  - in the metal industry
  - on plants according to 2001/80/EC LCPD
  - on plants according to IED 2010/75/EU

- Opacity measurements in flue gas e.g.
  - on cruise and container ships
  - on plants in accordance with US EPA 40 CFR 60 PS1

---

**Universal operating unit D-ISC 100**

The universal operating unit D-ISC 100 allows the connection of several DURAG measuring systems. Dust and volume flow measurements can be combined.

- Operation either via the built-in panel or remote
- Modular design, many expansion options available

**Options**

- Weather protection covers
- Automatic fail-safe shutters to protect the device in the event of a purge air failure
- Explosion proof design

---

**Technical data**

<table>
<thead>
<tr>
<th>Measurements</th>
<th>extinction, transmission, opacity, dust concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring ranges</td>
<td>extinction: 0...2.0 opacity: 0...100 % dust: 0...80 mg/m³...0...5000 mg/m³</td>
</tr>
<tr>
<td>Sample gas temperature</td>
<td>Above dew point up to 250 °C, optional up to 1000 °C</td>
</tr>
<tr>
<td>Inner duct pressure</td>
<td>-50...+20 hPa, optional higher</td>
</tr>
<tr>
<td>Duct diameter</td>
<td>1...18 m</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-40...+60 °C</td>
</tr>
</tbody>
</table>

---

**System components**

- measuring head
- reflector
- mounting flanges
- universal operating unit D-ISC 100
- purge air unit

---

**Convenient operation, readings anywhere accessible**

The D-R 290 has been used successfully for more than 15 years in various applications. The operation of the new generation D-R 290 is more convenient and more flexible. It is either operated

- via USB interface
- via RS-485 interface
- with the universal operating unit D-ISC 100

The software D-ESI 100 allows remote access via web interface. All settings can be changed without opening the device.

---

**Applications**

- Continuous emission monitoring e.g.
  - on incineration plants
  - on waste incineration plants
  - on power plants
  - on cement plants
  - in the metal industry
  - on plants according to 2001/80/EC LCPD
  - on plants according to IED 2010/75/EU

- Opacity measurements in flue gas e.g.
  - on cruise and container ships
  - on plants in accordance with US EPA 40 CFR 60 PS1

---

**Technical data**

<table>
<thead>
<tr>
<th>Measurements</th>
<th>extinction, transmission, opacity, dust concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring ranges</td>
<td>extinction: 0...2.0 opacity: 0...100 % dust: 0...80 mg/m³...0...5000 mg/m³</td>
</tr>
<tr>
<td>Sample gas temperature</td>
<td>Above dew point up to 250 °C, optional up to 1000 °C</td>
</tr>
<tr>
<td>Inner duct pressure</td>
<td>-50...+20 hPa, optional higher</td>
</tr>
<tr>
<td>Duct diameter</td>
<td>1...18 m</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-40...+60 °C</td>
</tr>
</tbody>
</table>

---

**System components**

- measuring head
- reflector
- mounting flanges
- universal operating unit D-ISC 100
- purge air unit

---

**Convenient operation, readings anywhere accessible**

The D-R 290 has been used successfully for more than 15 years in various applications. The operation of the new generation D-R 290 is more convenient and more flexible. It is either operated

- via USB interface
- via RS-485 interface
- with the universal operating unit D-ISC 100

The software D-ESI 100 allows remote access via web interface. All settings can be changed without opening the device.

---

**Universal operating unit D-ISC 100**

The universal operating unit D-ISC 100 allows the connection of several DURAG measuring systems. Dust and volume flow measurements can be combined.

- Operation either via the built-in panel or remote
- Modular design, many expansion options available

**Options**

- Weather protection covers
- Automatic fail-safe shutters to protect the device in the event of a purge air failure
- Explosion proof design

---

**Applications**

- Continuous emission monitoring e.g.
  - on incineration plants
  - on waste incineration plants
  - on power plants
  - on cement plants
  - in the metal industry
  - on plants according to 2001/80/EC LCPD
  - on plants according to IED 2010/75/EU

- Opacity measurements in flue gas e.g.
  - on cruise and container ships
  - on plants in accordance with US EPA 40 CFR 60 PS1

---

**Technical data**

<table>
<thead>
<tr>
<th>Measurements</th>
<th>extinction, transmission, opacity, dust concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring ranges</td>
<td>extinction: 0...2.0 opacity: 0...100 % dust: 0...80 mg/m³...0...5000 mg/m³</td>
</tr>
<tr>
<td>Sample gas temperature</td>
<td>Above dew point up to 250 °C, optional up to 1000 °C</td>
</tr>
<tr>
<td>Inner duct pressure</td>
<td>-50...+20 hPa, optional higher</td>
</tr>
<tr>
<td>Duct diameter</td>
<td>1...18 m</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-40...+60 °C</td>
</tr>
</tbody>
</table>