DURAG GROUP

D-R 220

Optical dust and opacity monitor

DURAG

Optical transmission analyser to measure the opacity or dust concentration of sample gas. Can be calibrated to measure low and high dust concentrations. Compact and cost effective system to monitor the opacity or dust concentration in combustion and filter systems, ducts and warehouses.

OVERVIEW

- In-situ measurement, continuous operation
- Suitable for systems with variable gas speed
- Allows calibration to measure the dust concentration in mg/m3
- Measurement of opacity
- Qualitative dust measurements for monitoring the function of filters
- Can be used even at thick-walled stone / insulated ducts
- Device is not in contact with sample gas
- Long life LED
- Hermetically sealed enclosures - no flue gas diffusion to optics or electronics unit
- Optimized purge air provides long maintenance intervals
- Easy installation, adjustment and maintenance
- Parameterization is possible with or without a PC locally
- Parameterization from external via RS-485 Modbus RTU possible

APPLICATIONS

Suitable for dust concentration measurement

- at incinerators in general
- at garbage, hazardous waste and sewage sludge incinerators,
- at facilities for cement production
- at power stations with gas, oil, coal or co-firing
- at converter plants and asphalt mixing plants
- at installations for the incineration of biomass

Suitable for measuring the opacity in flue gas

- at incinerators in general
- at RoRo-, cruise- and container ships operating in non-US EPA waters

Suitable for cost effective process monitoring for dust concentration and opacity

Suitable for filter monitoring

Suitable for measurement of dust load in warehouses

CERTIFICATIONS

TECHNICAL DATA

D-R 220 application data

Sample gas type	Air, flue gas, non flammable process gas
Sample gas temperature	Above due point, -20...200 °C (-4…392 °F) standard -20…600 °C (-4...1112 °F) option
Inner duct pressure	-50...+10 hPa (optional higher)
Sample gas relative humidity	0...95% RF, non-condensing
Stack/duct inner diameter	0.4…10 m (1.3…32.8 ft)

D-R 220 general

Measuring principle	Measuring the optical transmission of visible light which passed a measuring path twice.
Certificates	CE, Pattern Approval Certificate PRC
Measuring location	In-situ, non-contact
Self-check, protective functions	LED light source: no readjustment needed Automatic internal self-test
System components	D-R 220 M measuring head D-R 220 R reflector D-ISC 100 universal operating unit (option) D-R 220 SU purge air and power supply unit (option) D-R 220 E mounting flange with tube (option) Accessories

D-R 220 M measuring head

Physical measuring value	0…1.6 Extinction 0…97.5% Opacity
Derived measuring values	Transmission, opacity, extinction, dust concentration in mg/m3, mg/m3, mg/standard m3 (after calibration QAL2)
Measuring range transmission	100…0%
Output range transmission	Freely programmable
Measuring range opacity	0…100%
Output range opacity	Freely programmable
Measuring range extinction	0…1.6 EXT
Output range extinction	Freely programmable
Measuring range dust concentration	0…10000 mg/m3 (depending on calibration)
Output range dust concentration	Freely programmable
Lowest detection limit	0.2 % transmission
Combined standard uncertainty acc. to QAL1, DIN EN 14181	less than 0,013 Ext (2 mg/m3 for particle size 1…2µm, duct ID 5m (16.4 ft))
Light source, spectral range	530 nm, LED green
Process connection	Connection flange, bolt circle 100 mm, tube ID = 59 / 83 / 105 mm
Digital interfaces	RS 485 Modbus RTU, bi-directional communication, USB (Service)
Analog outputs	1x 4-20mA, 400 Ohm, isolated, assignment

	parameterisable
Digital outputs	2 x contact NC/NO, permissible load 60 VDC / 30 VAC / 0.5 A, function can be assigned. Typically: maintenance, failure
Power supply	Sensor supply voltage 24 VDC, 0,4 A
Ambient temperature (operational)	-20…+50 °C (-4…122 °F), optional higher
IP protection class (IEC 60529)	IP65
Dimensions (HxWxD)	150 x 132 x 214 mm (150 x 132 x 331 mm with purge air flange)
Weight	2.7 kg
Material	Housing: Polyamide, RAL 5017, fire class B1 (UL 94 V0), Purge air flange: 1.4571 (316 Ti)

D-R 220 R reflector

Process connection	Connection flange, bolt circle 100 mm, tube ID = 59 / 83 / 105 mm
Ambient temperature (operational)	-20…+50 °C (-4…122 °F), optional higher
IP protection class (IEC 60529)	IP65
Dimensions (HxWxD)	126 x 132 x 101 mm (126 x 132 x 218 mm with purge air flange)
Weight	1.6 kg
Material	Housing: Polyamide, RAL 5017, fire class B1 (UL 94 V0), Purge air flange: 1.4571 (316 Ti)

D-R 220 SU purge air and power supply unit

Usage with	D-R 220 M: 24 VDC, purge air supply D-R 220 R: purge air supply
Power supply	85…264VAC @ 46…63 Hz, other on request
Power consumption	50 W
Air supply capacity	20 m3/h (16 hPa) / 80 m3/h (4 hPa), other on request
Ambient temperature (operational)	-20…+50 °C (-4…122 °F), optional higher
IP protection class (IEC 60529)	IP65

Dimensions (HxWxD)	380 x 300 x 210 mm
Weight	13 kg
Material	Stainless steel 1.4301

D-ISC 100 interfaces

Electrical connections	1x Mini-USB 1x DURAG device connector M23 (option)
Digital interfaces	1x USB (service) 1x DURAG Modbus 1x Modbus RTU / RS-485 (optional extension module) 1x Profibus DP (optional DIN rail converter) 1x Modbus TCP (optional software module)
Analogue outputs	1x 4...20 mA, 400 Ohm, isolated, assignment programmable up to 17x with extension modules (option)
Analogue inputs	None (standard) 16x with extension modules (option) 0…20 mA, 50 Ohm, zero point programmable
Digital outputs	3x relais output, contact NC/NO, permissible load 48 V, 0,5 A potential free, assignment programmable up to 35x by extension modules (option)
Digital inputs	1x digital input (standard), potencial free, assignment programmable up to 33x by extension modules (option)
Power supply	90...264 VAC, 48...62 Hz, 200 VA
Display, status LEDs	Graphical LC display 120 x 92 mm, 5 LEDs for status display
Operation	Keypad Service software D-ESI 100, including remote access via web-interface (option), requires PC with Windows XP® or Windows 7® OS Remote access via USB / Modbus RTU (option) / Modbus TCP (option)

D-ISC 100 ambient conditions

Ambient temperature (operational)	-20 ... +50 °C (-4 ... 122 °F) -40 ... +60 °C (-40 ... 140 °F) (option)
IP protection class (IEC 60529)	IP65
Relative ambient humidity	≤ 95% RF, non-condensing. Use weather protection

	hood for ≥ 95% RF
Altitude	≤ 2000 m
EX zone	Zone 2 (option)

D-ISC 100 mechanical data

Dimensions (hxwxd)	220 x 335 x 145 mm 286 x 335 x 145 mm (incl. cable glands)
Weight	approx. 5 kg
Material	Stainless steel 1.4301, painted blue RAL 5017

Remarks

- The suitability of the D-R 220 for the listed ranges depends on the kind of dust, the size distribution and the duct diameter.
- Subject to technical modifications.

DOWNLOADS

Downloads

- Product brochure D-R 220 / DE (150 KB)
- Product brochure D-R 220 / EN (151 KB)
- Product brochure D-R 220 / RU (354 KB)
- Product Overview Environmental Monitoring / DE (6 MB)
- Product Overview Environmental Monitoring / EN (6 MB)
- Questionnaire Environmental Monitoring / DE (416 KB)
- Questionnaire Environmental Monitoring / FR (420 KB)
- Questionnaire Environmental Monitoring / EN (416 KB)

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