## Visibility monitor

### Features & benefits
reliable measurement along the tunnel
no separate control unit required
simple configuration
corrosion resistant
simple and quick mounting
- simple alignment
Measuring head and reflector can be exchanged
  without tools in a few seconds
- no tools required
- no additional alignment required
signal transmission by analogous and digital signals
  as well as by RS 485 bidirectional
MODBUS RTU
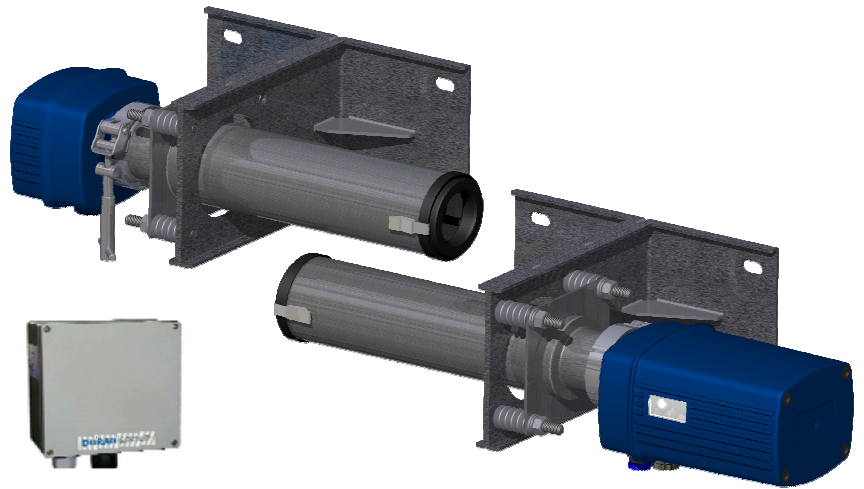reduced spare requirements
extremely low maintenance

### Description
D-R 220T consists of a light emitting and recieving measuring head and an optical reflector
The device determines the light transmission along a 10m measuring path.
The determined transmission allows calculation of visibility which is indicated by it's extinction coefficient VIS k in units 1/m
The influence of contamination of optical windows on the measuring results is compensated.The system can be checked and set by access to measuring head, either through local USB port or remotely using RS 485 bidirectional MODBUS RTU interface.
This prevents necessity of blocking traffic.
LED status indicators allow to inspect the status of the measuring head. The LED can be inspected from outside
D-R 220T executes internal self testing routines automatically and requires extremely low maintenance

| D-R 220T M sensor (A1) | | | |
|---|---|---|---|
| measuring principle | determination of optical transmission | ambient temperature | -25 to 55 ℃ |
| components measured (access via RS485 MODBUS RTU) | transmission, opacity, extinction, visibility : extinction coefficient VIS K [m-1] | protection, weight | IP 65, ca. 2.7 kg reflector ca 1.7 kg |
| measuring range: | VIS K: 0-15…150 km-1 VIS K: 0-0,015...0,15 m-1 | Sensor material | stainless steel 1.4571/316Ti polyamide, ca. RAL5017 flammability rating: B1 (UL 94 V0), |
| response time: | minimum 2s can be configured up to 180s | conformity: | 2004/108 EC (EMV directive) 2006/95 EC( Low voltage directive) |
| output range (analog output): | can be configured, typically:  VIS K: 0-15 km-1 | | EN 61 326-1 (2006), industrial environment EN 61 010-1 (2001) |
| measuring path | 10m | | |
| orientation of measuring path: | parallel to tunnel axis | D-R 220T TUBUS | |
| signal transmission | 1x 4-20mA, 500 Ohm, isolated | material | 1.4571/316Ti |
| | | fixation at tunnel wall | 4x bolt od=8mm |
| status contacts | 1x fault contact 1x limit alarm rating 48V, 0.5 A variable assignment | D-TB 100T terminal box (X1) | |
| | | power supply (terminal box) | 90-264VAC, approx. 30VA (for X1) |
| transfer of values: | 1x RS 485 MODBUS RTU bi directional to control room | fixation at tunnel wall | 4x bolt od=8mm |
| Service Interface: | USB 1.1 port | protection | IP 66, 1.5 kg |
| Service tool: | software D-ESI 100 requires netbook / laptop and Windows XP ™ OS | material | polycarbonate, ca. RAL 7035 flammability rating: B1  (UL 94 V0) |
| control cycle | internal automated routines, self test | system components: | 1x D-R 220T M measuring head incl. 1.5m cable with plug 1x D-R 220 R3 reflector 2x D-R 220T Tubus 1.4571/316Ti 2x D-RV 290 BW mounting bracket 2x D-R 220 CLP |
| power supply (sensor) | 24 VDC +- 10%, ca. 1 A | | 1x D-TB 100T terminal box |