## D-R 220 T

## 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



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



measuring principle determination of optical transmission components measured (access via RS485 MODBUS extinction, visibility: extinction coefficient VIS K [m-1] protection, weight IP 65, ca. 2.7 kg reflector ca 1.7 kg  PFS, ca. 2.2 kall call call call call call call call	D-R 220T M sensor (A1)			
(access via RS485 MODBUS RTU)  measuring range:  VIS K: 0-15150 km-1 VIS K: 0-0,0150,15 m-1 VIS K: 0-10,15 m-1 VIS K: 0-10 km-1 VIS K: 0-10	measuring principle	•	ambient temperature	-25 to 55 ℃
VIS K: 0-0,0150,15 m-1  VIS K: 0-0,0150,15 m-1  vis polyamide, ca. RAL5017 flammability rating: B1 (UL 94 V0),  response time:  minimum 2s can be configurated up to 180s  output range (analog output): can be configurated, typically: VIS K: 0-15 km-1  measuring path 10m  orientation of measuring path: parallel to tunnel axis signal transmission  1x 4-20mA, 500 Ohm, isolated  status contacts  1x fault contact 1x limit alarm rating 48V, 0.5 A variable assignment bid idrectional to control room  Service Interface:  USB 1.1 port Service tool:  Service tool:  conformity:  2004/108 EC (EMV directive) 2006/95 EC( Low voltage directive)  EN 61 326-1 (2006), industrial environment EN 61 010-1 (2001)  PR 220T TUBUS  material  1.4571/316Ti fixation at tunnel wall  4x bolt od=8mm  4x bolt od=8mm  5x bolt od=8m	(access via RS485 MODBUS	extinction, visibility: extinction	protection, weight	
can be configurated up to 180s  output range (analog output): can be configurated, typically: VIS K: 0-15 km-1  measuring path 10m  orientation of measuring path: signal transmission 1x 4-20mA, 500 Ohm, isolated 1x limit alarm rating 48V, 0.5 A variable assignment 1x Transfer of values: 1x RS 485 MODBUS RTU bi directional to control room  Service Interface: USB 1.1 port Service tool: software D-ESI 100 requires netbook / laptop and Windows XP ™ OS  control cycle   Description   Descript	measuring range:		Sensor material	polyamide, ca. RAL5017 flammability rating: B1 (UL 94
typically: VIŠ K: 0-15 km-1  measuring path  10m  orientation of measuring path:  signal transmission  1x 4-20mA, 500 Ohm, isolated  fixation at tunnel wall  transfer of values:  1x RS 485 MODBUS RTU bi directional to control room  Service Interface:  USB 1.1 port  software D-ESI 100 requires netbook / laptop and Windows XP TM OS  control cycle  internal automated routines, self test  typically: VIŠ K: 0-15 km-1  10m  D-R 220T TUBUS  material  fixation at tunnel wall  4x bolt od=8mm  1.4571/316Ti  fixation at tunnel wall  4x bolt od=8mm  90-264VAC, approx. 30VA (for X1)  fixation at tunnel wall  4x bolt od=8mm  90-264VAC, approx. 30VA (for X1)  4x bolt od=8mm  1x fault contact  1x RS 485 MODBUS RTU bi directional to control room  Service Interface:  USB 1.1 port  software D-ESI 100 requires netbook / laptop and Windows XP TM OS  internal automated routines, self test  polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  system components:  1x D-R 220T M measuring head incl. 1.5m cable with plug  1x D-R 220 R3 reflector  2x D-R 220 R3 reflector  2x D-R 220 T Tubus  1.4571/316Ti  2x D-RV 290 BW mounting bracket  2x D-R 220 CLP  1x D-R 220 CLP  1x D-R 220 CLP  1x D-R 100T terminal box	response time:	can be configurated up to	conformity:	2006/95 EC( Low voltage
orientation of measuring path: signal transmission  1x 4-20mA, 500 Ohm, isolated  1x fault contact 1x limit alarm rating 48V, 0.5 A variable assignment  1x RS 485 MODBUS RTU bi directional to control room  Service Interface:  USB 1.1 port Service tool:  Service tool:  Control cycle  Internal automated routines, self test  D-R 220T TUBUS  material 1.4571/316Ti fixation at tunnel wall  4x bolt od=8mm  90-264VAC, approx. 30VA (for X1)  power supply (terminal box (for X1)  4x bolt od=8mm  fixation at tunnel wall 4x bolt od=8mm  protection IP 66, 1.5 kg  material polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  system components: 1x D-R 220T M measuring head incl. 1.5m cable with plug 1x D-R 220T Tubus 1.4571/316Ti 2x D-R 220 R3 reflector 2x D-R 220T Tubus 1.4571/316Ti 2x D-R V 290 BW mounting bracket 2x D-R 220 CLP  power supply (sensor)  24 VDC +- 10%, ca. 1 A		typically: VIS K: 0-15 km-1		environment
signal transmission  1x 4-20mA, 500 Ohm, isolated  1x fault contact 1x limit alarm rating 48V, 0.5 A variable assignment  1x RS 485 MODBUS RTU bi directional to control room  Service Interface:  USB 1.1 port Service tool:  Service tool:  control cycle  internal automated routines, self test  1x G4-20mA, 500 Ohm, isolated  1x fault contact 1x fixation at tunnel wall  D-TB 100T terminal box (X1) power supply (terminal box) po-264VAC, approx. 30VA (for X1)  1x RS 485 MODBUS RTU bi directional to control room protection protection material polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0) 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-R 220 R3 reflector 2x D-R 220 CLP power supply (sensor)  24 VDC +- 10%, ca. 1 A 1x D-TB 100T terminal box 1x dot od=8mm 1x dot	• •			EN 61 010-1 (2001)
isolated fixation at tunnel wall 4x bolt od=8mm  Status contacts 1x fault contact 1x limit alarm rating 48V, 0.5 A variable assignment 1x RS 485 MODBUS RTU bi directional to control room  Service Interface: USB 1.1 port protection protection material polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 Windows XP ™ OS internal automated routines, self test system components: 1x D-R 220T M measuring head incl. 1.5m cable with plug 1x D-R 220T Tubus 1.4571/316Ti 2x D-R 220 CLP power supply (sensor) 24 VDC +- 10%, ca. 1 A	orientation of measuring path:	parallel to tunnel axis	D-R 220T TUBUS	
1x limit alarm rating 48V, 0.5 A variable assignment  transfer of values:  1x RS 485 MODBUS RTU bi directional to control room  Service Interface:  USB 1.1 port Service tool:  software D-ESI 100 requires netbook / laptop and Windows XP ™ OS  control cycle  internal automated routines, self test  1x RS 485 MODBUS RTU bi directional to control room  protection material  protection protection material  polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  system components: 1x D-R 220T M measuring head incl. 1.5m cable with plug 1x D-R 220T Tubus 1.4571/316Ti 2x D-R 220T Tubus 1.4571/316Ti 2x D-R 220 CLP power supply (sensor)  24 VDC +- 10%, ca. 1 A	signal transmission			
variable assignment  transfer of values:  1x RS 485 MODBUS RTU bi directional to control room  Service Interface:  USB 1.1 port  software D-ESI 100 requires netbook / laptop and Windows XP ™ OS  control cycle  internal automated routines, self test  yariable assignment  (for X1)  4x bolt od=8mm  lP 66, 1.5 kg polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flammability rating: B1 (UL 94 V0)  xyoether between the polycarbonate, ca. RAL 7035 flamma	status contacts	1x limit alarm	(X1)	
bi directional to control room  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  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 220T Tubus 1.4571/316Ti 2x D-R 220T Tubus 1.4571/316Ti 2x D-R 220 BW mounting bracket 2x D-R 220 CLP  power supply (sensor) 24 VDC +- 10%, ca. 1 A			power supply (terminal box)	
Service tool:  software D-ESI 100 requires netbook / laptop and Windows XP ™ OS  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 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	transfer of values:		fixation at tunnel wall	4x bolt od=8mm
requires netbook / laptop and Windows XP ™ OS  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 220T Tubus   1.4571/316Ti   2x D-R 220T Tubus   1.4571/316Ti   2x D-R 220 BW mounting bracket   2x D-R 220 CLP	Service Interface:	USB 1.1 port	protection	IP 66, 1.5 kg
self test  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	Service tool:	requires netbook / laptop and	material	flammability rating: B1 (UL 94
	control cycle	self test	system components:	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
	power supply (sensor)	24 VDC +- 10%, ca. 1 A	_	

## DURAG

DURAG GmbH Kollaustrasse 105, 22453 Hamburg Germany Tel. +49 (0)40 55 42 18-0 E-Mail: info@durag.de

DURAG France S.a.r.I.
Parc GIP Charles de Gaulle,
49, rue Léonard de Vinci,
95-691 GOUSSAINVILLE CEDEX, France
Tel. +33 (0)1 301 811 80
E-Mail: info@durag-france.fr

DURAG UK Office

Honeysuckle Cottage, Ridding Bank Stoke on Trent Staffordshire ST4 8SB, Great Britain Tel. +41 (0)1782 657666 E-Mail: duragunk@durag.de

DURAG, Inc., USA, 1355 Mendota Helghts Road, Sulte 200, Mendota Helghts, MN 55120, USA Tel. +1651 451-1710 E-Mail: durag@durag.com DURAG India Instrumentation Ltd #143/16, Ground Floor

#143/16, Ground Floor 4th Main Road Industrial Town, Rajajinagar Bengalooru 560 044, India Tel. +91 (0)80 23 14 56 26 E-Mail: info@duragindia.com

www.durag.de



Hegwein GmbH, Am Boschwerk 7 70469 Stuttgart, Germany Tel. +49 (0)711 135 788-0



Smitsvonk Holland B.V. Loodstraat 57, 2718 RV Zoetermeer Netherlands Tel. +31 (0)79 361 35 33 E-mail: sales@smitsvonk.nl



VEREWA GmbH

Kollaustrasse 105, 22453 Hamburg Germany, Tel. +49 (0)40 55 42 18-0 E-Mail: verewa@durag.de



DURAG process & systems technology gmbh, Kollaustraße 105, 22453 Hamburg, Germany Tel. +49 (0)4055 42 18-0 E-Mail: info@durag-process.de