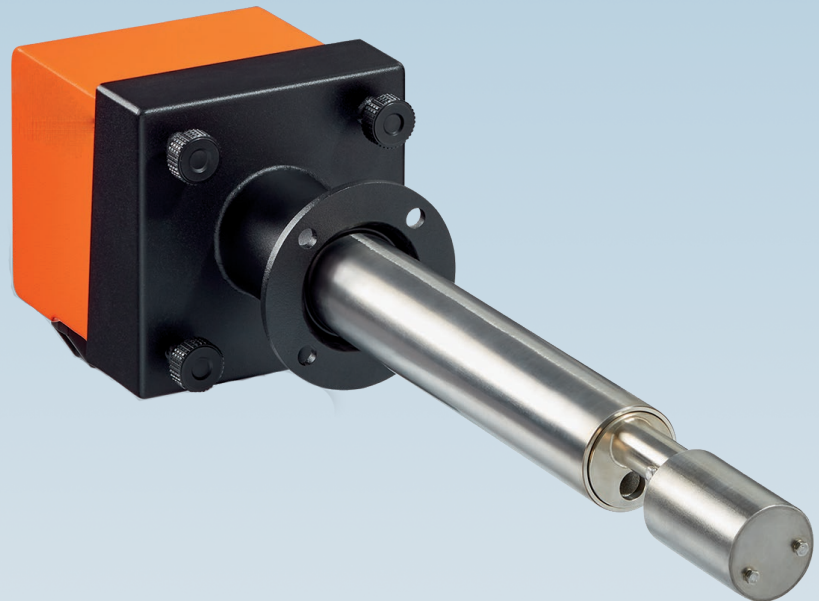# DUSTHUNTER SP100
Proven probe design with forward scattered light measurement

Scattered light dust measuring

- Ideal for thick- or double-walled ducts
- Approved according to EN 15267
- Low maintenance due to self-monitoring and contamination check
- Quick installation – no alignment required

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DUSTHUNTER SP100:
Scattered light dust measuring

Product Description

The DUSTHUNTER SP100 is a type-approved measuring device with probe for very low to medium dust concentrations. Installation from one side makes it ideal for thick-walled or double-walled ducts. The measurement is based on the forward scattering of light. An automated check of the zero and reference point as well as a contamination check are on board in the device.

At a glance

- Installation from one side
- For very low to medium dust concentrations
- Automated check of zero and reference point
- Contamination check
- Hastelloy measuring probe available for corrosive gases
- For small to medium duct diameters
- Device version for explosive zone 2/22 or 1/21

Your benefits

- Ideal for thick- or double-walled ducts
- Approved according to EN 15267
- Low maintenance due to self-monitoring and contamination check
- Quick installation – no alignment required

Fields of application

- Emissions monitoring at power plants and waste incineration plants
- Monitoring of filter systems
- Measurements in exhaust gas or exhaust ventilation ducts

More Information online
For more information, enter the link or scan the QR code to get direct access to technical data, operating instructions, software, application examples, and much more.
www.endress.com/dusthunter-sp100

Technical data

The precise device specifications and product performance data may vary and are dependent on the respective application and customer specifications.

DUSTHUNTER SP100

Measured values	Scattered light intensity, dust concentration (after gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	
Dust concentration	0 ... 5 mg/m³ / 0 ... 500 mg/m³ Higher measuring ranges on request
Certified measuring ranges	
Dust concentration	0 ... 7.5 mg/m³ / 0 ... 10 mg/m³ / 0 ... 15 mg/m³ / 0 ... 50 mg/m³ / 0 ... 100 mg/m³ / 0 ... 200 mg/m³ / 0 ... 500 mg/m³
Response time (t_{90})	1 s ... 600 s; freely adjustable
Accuracy	≤ 2 % of measuring range full scale
Duct diameter	≥ 0.25 m (9.84")
Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 27. BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 MCERTS 2010/75/EU U.S. EPA PS-11 compliant
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test with reference filter

DUSTHUNTER SP100 Ex-2K

Measured values	Scattered light intensity, dust concentration (after gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	
Dust concentration	0 ... 5 mg/m³ / 0 ... 500 mg/m³
	Higher measuring ranges on request

Certified measuring ranges	
Dust concentration	0 ... 7.5 mg/m³ / 0 ... 10 mg/m³ / 0 ... 15 mg/m³ / 0 ... 50 mg/m³ / 0 ... 100 mg/m³ / 0 ... 200 mg/m³ / 0 ... 500 mg/m³
Response time (t_{90})	1 s ... 600 s; freely adjustable
Accuracy	≤ 2 % of measuring range full scale
Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 2010/75/EU 27. BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 U.S. EPA PS-11 compliant
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test with reference filter

DUSTHUNTER SP100 Ex-3K

Measured values	Scattered light intensity, dust concentration (after gravimetric comparison measurement)
Performance-tested measurands	Scattered light intensity
Measurement principles	Scattered light forward
Spectral range	640 nm ... 660 nm Laser, protection class 2, power < 1 mW
Measuring ranges	
Dust concentration	0 ... 5 mg/m³ / 0 ... 500 mg/m³
	Higher measuring ranges on request
Certified measuring ranges	
Dust concentration	0 ... 7.5 mg/m³ / 0 ... 10 mg/m³ / 0 ... 15 mg/m³ / 0 ... 50 mg/m³ / 0 ... 100 mg/m³ / 0 ... 200 mg/m³ / 0 ... 500 mg/m³
Response time (t_{90})	1 s ... 600 s; freely adjustable
Accuracy	≤ 2 % of measuring range full scale
Conformities	Approved for plants requiring approval 2001/80/EC (13. BImSchV) 2000/76/EC (17. BImSchV) 2010/75/EU 27. BImSchV TA-Luft (Prevention of Air Pollution) EN 15267 EN 14181 U.S. EPA PS-11 compliant
Electrical safety	CE
Test functions	Automatic self-test (linearity, contamination, drift, aging) Contamination limit values: Warning at 30%; fault at 40% Manual linearity test with reference filter

DHSP-Txxx sender/receiver unit

Process temperature	
Standard version DHSP-T2xx:	−40 °C … +220 °C
High temperature version DHSP-T2xx:	−40 °C … +400 °C
Process pressure	
With MCU-P control unit:	−50 hPa … 10 hPa
With external purge air unit:	−50 hPa … 30 hPa
With instrument air (provided by the customer):	−100 hPa … 100 hPa
Process gas humidity	Non-condensing
Ambient temperature	−40 °C … +60 °C
Electrical safety	CE
Enclosure rating	IP66
Dimensions (W x H x D)	Dimensions may vary. For details, see the dimensional drawings.
Weight	
Nominal length 435 mm:	6.5 kg
Nominal length 735 mm:	7.8 kg
Nominal length 1,035 mm:	9.5 kg
Nominal length 1,335 mm:	11 kg
Power supply	
Voltage	24 V DC
Voltage	Supply via control unit
Power consumption	≤ 4 W

DHSP-Txxxx1EX2K sender/receiver unit

Process temperature	
DHSP-T2xxx1EX2K standard version:	−40 °C ... +220 °C (-40 °F ... +428 °F)
DHSP-T4xxx1EX2K high-temperature version:	−40 °C ... +400 °C (-40 °F ... +752 °F)
Process pressure	
With instrument air (provided by customer):	0 hPa ... 3,000 hPa Absolute pressure
Process gas humidity	Non-condensing
Duct diameter	≥ 0.25 m (9.84")
Ambient temperature	−40 °C ... +60 °C (-40 °F ... +140 °F)
Ex-approvals	
IECEx	Ex db op is IIC T6 Gb Ex tb op is IIIC T85°C Db
ATEX	Ex II 2G Ex db op is IIC T6 Gb Ex II 2D Ex tb op is IIIC T85°C Db
Electrical safety	CE, Protection class III
Enclosure rating	IP66
Dimensions (W x H x D)	Dimensions may vary. For details, see the dimensional drawings.
Weight	
Nominal length 435 mm (17.12"):	14 kg (30.86 lbs)
Nominal length 735 mm (28.94"):	15.3 kg (33.73 lbs)
Power supply	
Voltage	24 V DC
Voltage	Supply via control unit
Power consumption	≤ 8 W

DHSP-Txxxx1EX3K sender/receiver unit

Process temperature	
DHSP-Txxxx1EX3K standard version:	−15 °C ... +220 °C (-40 °F ... +428 °F)
DHSP-Txxxx1EX3K high-temperature version:	−15 °C ... +400 °C (-40 °F ... +752 °F)
Process pressure	
With instrument air (provided by customer):	−100 hPa ... 100 hPa
Process gas humidity	Non-condensing
Duct diameter	≥ 0.25 m (9.84")
Ambient temperature	−15 °C ... +60 °C (-5 °F ... +140 °F)

Ex-approvals	
IECEx	Ex II 3G Ex nR op is IIC T6 Gc Ex II 3D Ex tc op is IIIC T85°C Dc
ATEX	CE, Protection class III
Electrical safety	IP66
Enclosure rating	Dimensions may vary. For details, see the dimensional drawings.
Dimensions (W x H x D)	
Weight	13.5 kg (29.76 lbs)
Nominal length 435 mm (17.12"):	14.8 kg (32.63 lbs)
Nominal length 735 mm (28.94"):	
Power supply	24 V DC
Voltage	Supply via control unit
Voltage	≤ 4 W
Power consumption	≤ 8 W

MCU-N control unit

Description	Unit to control the system components and to evaluate and output the data provided by them
Ambient temperature	−40 °C … +60 °C (-40 °F … +140 °F)
Electrical safety	CE, Protection class I
Enclosure rating	IP66
Analog outputs	1 output: 0/2/4 … 20 mA, 750 Ω Electrically isolated; two additional outputs if using I/O modules (option)
Analog inputs	2 inputs: 0 … 20 mA, 110 Ω Not electrically isolated; two additional inputs if using I/O modules (option)
Digital outputs	5 relay contacts: 48 V, 1 A Potential-free; for status signals
Digital inputs	4 potential-free contacts
Modbus Type of fieldbus integration	✔ TCP (via optional interface module, only one module possible per MCU) RTU RS-485 (via optional interface module, only one module possible per MCU)
PROFIBUS DP Type of fieldbus integration	✔ Via optional interface module (only one module possible per MCU)
Ethernet Type of fieldbus integration	✔ Via optional interface module (only one module possible per MCU)
Function	Connection to SOPAS ET software or OPC server
Indication	LC display
	Status LEDs: "Power," "Failure," and "Maintenance request"
Operation	Via LC-display or software SOPAS ET
Dimensions (W x H x D)	210 mm x 340 mm x 120 mm (8.27" x 13.39" x 4.72") (for details see dimensional drawings)
Weight	3.7 kg (8.16 lbs)

Power supply	
Voltage	90 V AC … 250 V AC
Voltage	Version with 24 V DC available as an option
Frequency	47 … 63 Hz
Power consumption	≤ 50 VA
Options	Interface module(s) I/O module(s)

MCU-P control unit

Description	Unit to control the system components and to evaluate and output the data provided by them. With integrated purge air unit.
Gas flow rate	≤ 20 m³/h
Ambient temperature	−40 °C … +45 °C (-40 °F … +113 °F) Intake temperatures for purge air
Electrical safety	CE, Protection class I
Enclosure rating	IP66
Analog outputs	1 output: 0/2/4 … 20 mA, + 750 Ω Electrically isolated; two additional outputs if using I/O modules (option)
Analog inputs	2 inputs: 0 … 20 mA, 110 Ω Not electrically isolated; two additional inputs if using I/O modules (option)
Digital outputs	5 relay contacts: 48 V, 1 A; Potential-free; for status signals
Digital inputs	4 potential-free contacts
Modbus Type of fieldbus integration	✔ TCP (via optional interface module, only one module possible per MCU) RTU RS-485 (via optional interface module, only one module possible per MCU)
PROFIBUS DP Type of fieldbus integration	✔ Via optional interface module (only one module possible per MCU)
Ethernet Type of fieldbus integration	✔ Via optional interface module (only one module possible per MCU)
Function	Connection to SOPAS ET software or OPC server
Indication	LC display Status LEDs: "Power," "Failure," and "Maintenance request"
Operation	Via LC-display or software SOPAS ET
Dimensions (W x H x D)	300 mm x 455 mm x 220 mm (11.8" x 17.91" x 8.66") (for details see dimensional drawings)
Weight	13.5 kg (29.76 lbs)
Power supply	
Voltage	90 V AC … 250 V AC
Voltage	Version with 24 V DC available as an option
Frequency	47 … 63 Hz
Power consumption	≤ 70 VA
Options	Interface module(s) I/O module(s)

MCUDH Ex-3K control unit

Description	Unit to control the system components and to evaluate and output the data provided by them
Ambient temperature	
With integrated power supply unit:	−25 ℃ ... +50 ℃ (-13 ℉ ... +122 ℉)
With external 24 V supply:	−40 ℃ ... +60 ℃ (-40 ℉ ... +140 ℉)
Ex-approvals	
ATEX	With integrated power supply unit Ex II 3G Ex ec nA nC IIC T4 Gc Ex II 3D Ex tc IIIC T85℃ Dc Ex II 3G Ex ec IIC T4 Gc Ex II 3D Ex tc IIIC T85℃ Dc
Electrical safety	CE, Protection class I (with integrated power supply unit), Protection class III (without integrated power supply unit)
Enclosure rating	IP65
Analog outputs	1 output: 0/2/4 ... 20 mA, 750 Ω Electrically isolated
Analog inputs	2 inputs: 0 ... 20 mA, 110 Ω Not electrically isolated
Digital outputs	5 relay contacts: 48 V, 1 A Potential-free; for status signals
Digital inputs	4 potential-free contacts
Modbus Type of fieldbus integration	✔ RTU RS-485 (via optional interface module, Only one module possible per MCU. Other interfaces are possible outside explosive zones using an external connection module.)
Indication	LC display
Operation	Via LC-display or software SOPAS ET
Dimensions (W x H x D)	300 mm x 300 mm x 220 mm (11.8" x 11.8" x 8.66") (for details see dimensional drawings)
Weight	8.8 kg (19.4 lbs)
Power supply	
Voltage	90 V AC ... 250 V AC
Voltage	Type with external 24 V supply optionally available
Frequency	47 ... 63 Hz
Power consumption	≤ 50 VA

SLV4-2 purge air unit, 2BH1300, 3-ph

Description	Unit to provide dust-free air for flushing of optical surfaces
Gas flow rate	38 m³/h ... 63 m³/h At 30 hPa counter pressure, depending on low pressure inside the filter
Ambient temperature	−40 °C ... +55 °C (-40 °F ... +131 °F)
Electrical safety	CE
Enclosure rating	IP54
Dimensions (W x H x D)	550 mm x 550 mm x 257 mm (for details see dimensional drawings)
Weight	18 kg (39.68 lbs)
Power supply	
Three-phase current	Δ: 200 ... 240 V, 50 Hz, 2,6 A, 400 W Y: 345 ... 415 V, 50 Hz, 1,5 A, 400 W Δ: 200 ... 275 V, 60 Hz, 2,6 A, 500 W Y: 380 ... 480 V, 60 Hz, 1,5 A, 500 W Δ: 270 ... 330 V, 50 Hz, 2,0 A, 400 W Y: 465 ... 570 V, 50 Hz, 1,16 A, 400 W Δ: 290 ... 360 V, 60 Hz, 2,1 A, 500 W Y: 500 ... 600 V, 60 Hz, 1,26 A, 500 W Δ: 230 V, 50 Hz, 2,7 A, 370 W Δ: 115 V, 60 Hz, 3,0 A, 450 W Δ: 220 ... 270 V, 50 Hz, 2,5 A, 400 W Y: 380 ... 465 V, 50 Hz, 1,45 A, 400 W Δ: 240 ... 290 V, 60 Hz, 2,6 A, 500 W Y: 415 ... 500 V, 60 Hz, 1,55 A, 500 W
Auxiliary gas connections	
Purge air	40 mm (1.57")
Test functions	Pressure switch (switching point −35 hPa)
Integrated components	2-step air filter, type Europiclon, dust capacity 200 g (0.44 lbs)

Order information

Our regional sales organization will be glad to advise you on which device configuration is best for you.

Dimensional drawings

DHSP-Txx1/-Txx2 sender/receiver unit (dimensions in mm (inch))
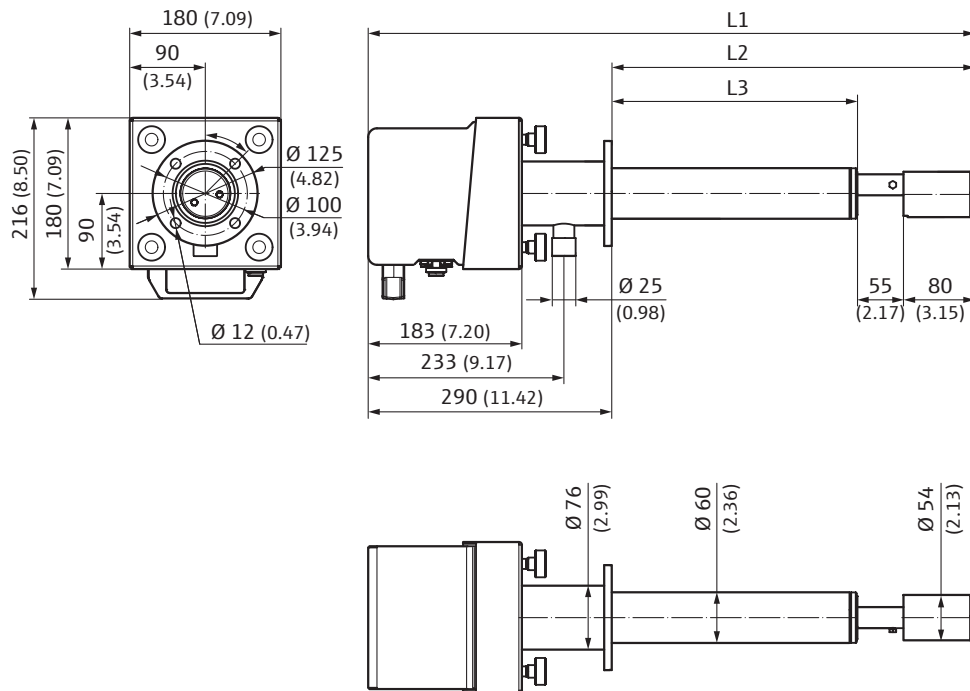
| Sender/receiver unit Type	L1	Nominal length of the probe L2	L3
DHSP-Txx1	725 (28.54")	435 (17.12")	300 (11.81")
DHSP-Txx2	1,025 (40.35")	735 (28.94")	600 (23.62")
All dimensions in mm (inch)			

DHSP-Txx3/-Txx4/-Txx5/-Txx6/-Txx7 sender/receiver unit (dimensions in mm (inch))
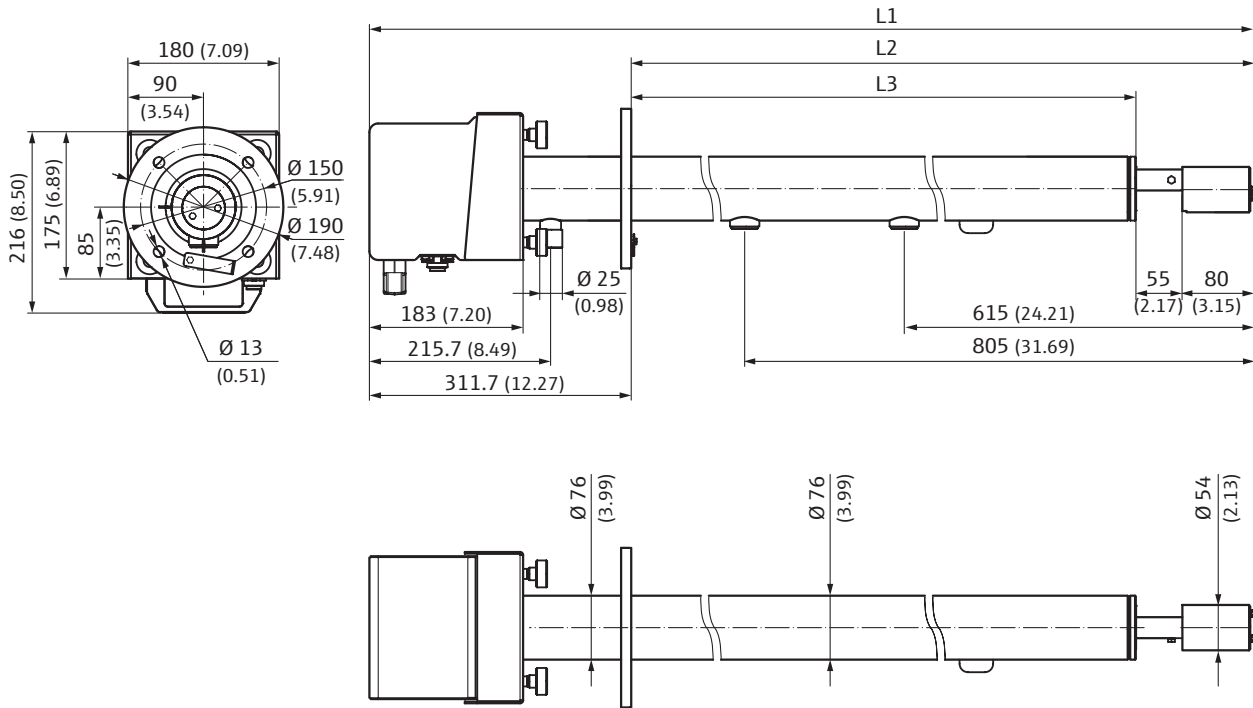
Sender/receiver unit Type	L1	Nominal length of the probe L2	L3
DHSP-Txx3	1,347 (53.03")	1,035 (40.75")	900 (35.43")
DHSP-Txx4	1,647 (64.84")	1,335 (52.55")	1,200 (47.24")
DHSP-Txx5	1,947 (76.65")	1,635 (64.37")	1,500 (59.06")
DHSP-Txx6	2,147 (84.53")	1,835 (72.24")	1,700 (66.93")
DHSP-Txx7	2,397 (94.37")	2,085 (82.09")	1,950 (76.77")

All dimensions in mm (inch)

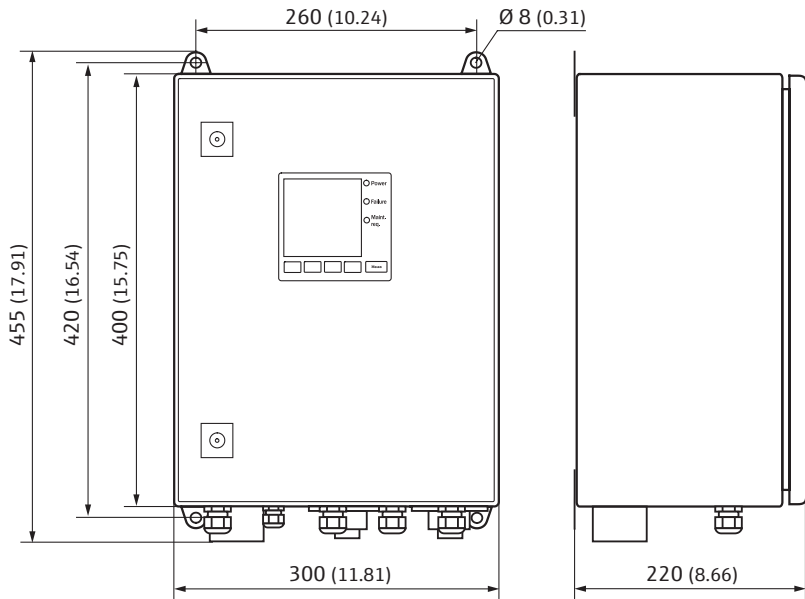## DHSP-Txxxx1EX2KT6 sender/receiver unit (dimensions in mm (inch)
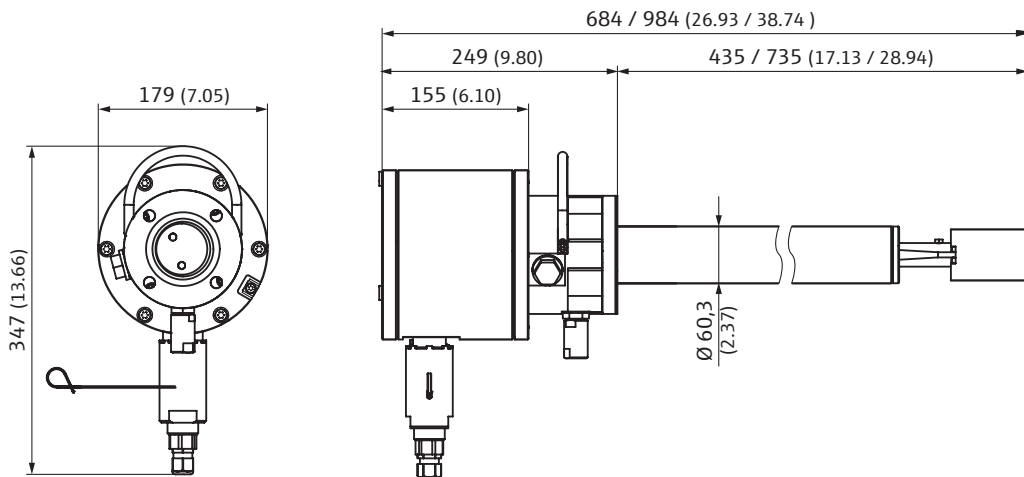
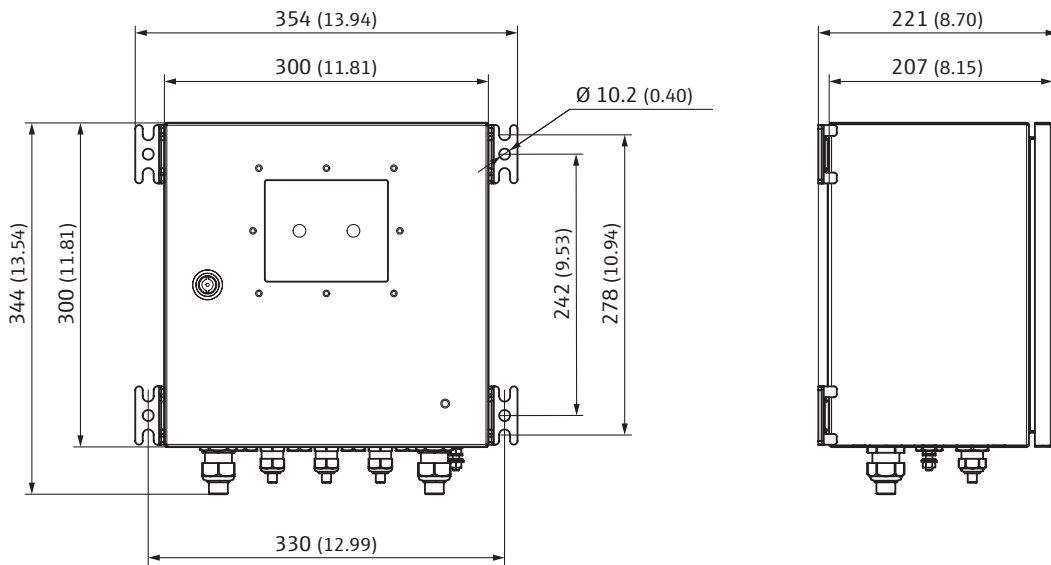## DHSP-Txxxx1EX3K sender/receiver unit (dimensions in mm (inch))
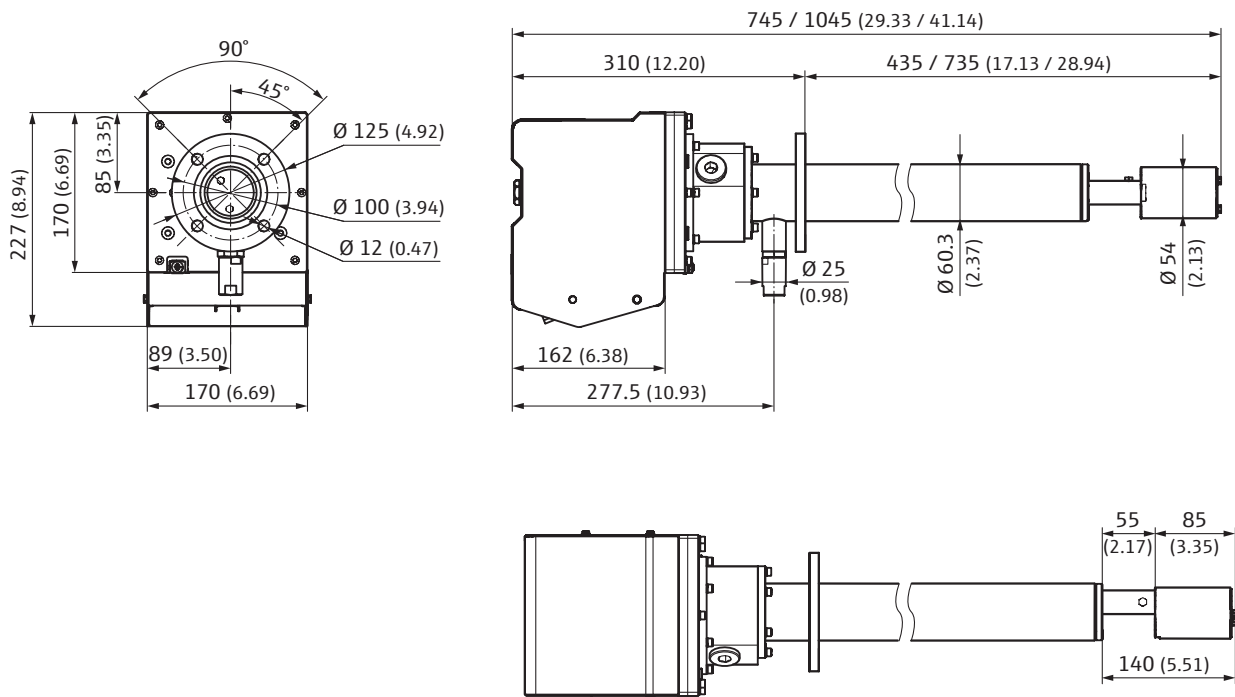
MCU-N control unit; wall-mounting enclosure, compact version (for non-hazardous areas only) (dimensions in mm (inch))
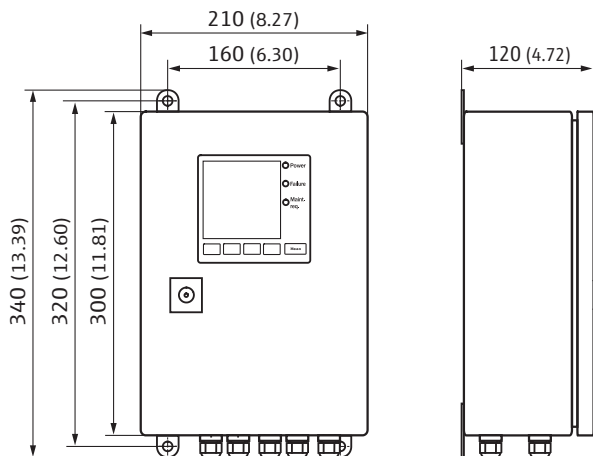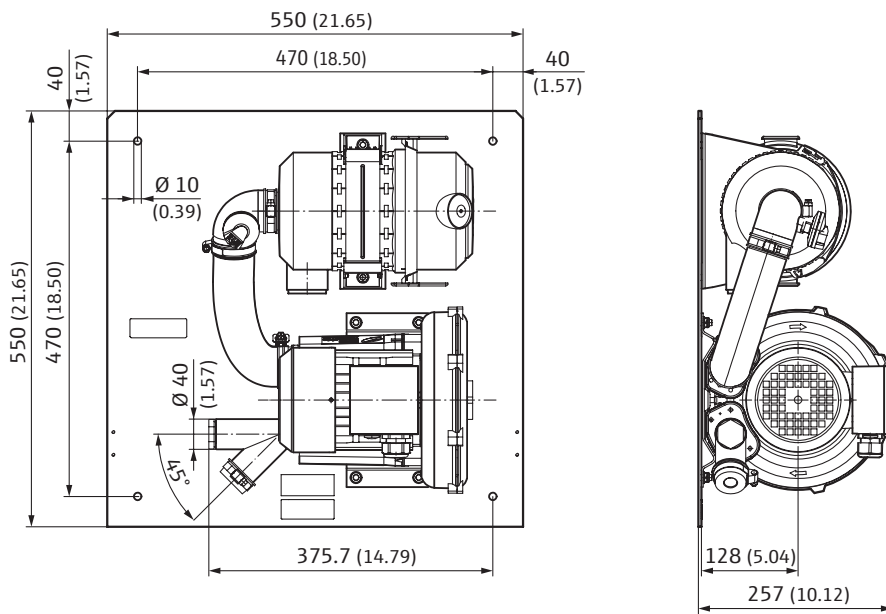
MCU-P control unit; wall-mounting enclosure, compact version (for non-hazardous areas only) (dimensions in mm (inch))
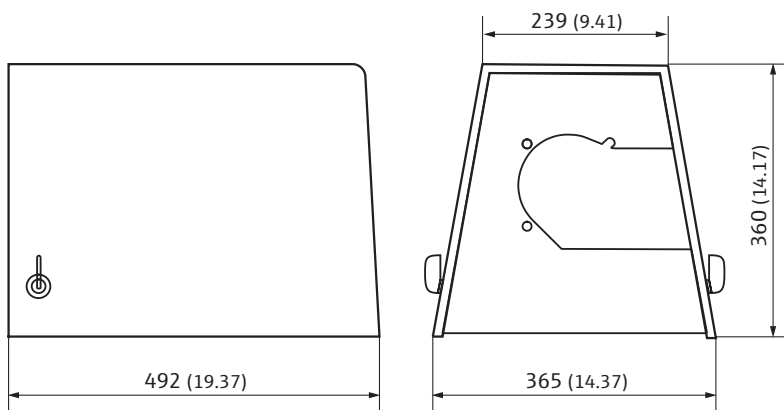

MCUDH Ex-3K control unit (dimensions in mm (inch))

SLV4-2 purge air unit, 2BH1300 (dimensions in mm (inch))

Weather protection cover for sender/receiver unit DHSP-Txx3/-Txx4/-Txx5/-Txx6/-Txx7 (dimensions in mm (inch))

Accessories

Optics cloths

Brief description	Part no.
Cloth for cleaning optical surfaces	4003353

Test and monitoring tools

Brief description	Part no.
Control filter set comprises: filter with approx. 0%, 18%, 40%, 60%, 80% transmission, filter holder, lens cloth, case with insert	2049045

Sets and kits

Brief description	Part no.
DR290 replacement set consisting of: 1.4571 steel blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085134
OMD41 replacement set consisting of: 1.4571 steel blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085136
Replacement set RM41 consisting of: Adapter flange steel 1.0037, adapter plate, sealings, nuts and washers, information document	2089509
RM41 replacement set consisting of: 1.0254 steel adapter flange, blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085132
RM41 replacement set consisting of: 1.4571 steel adapter flange, blind flange, flat seal, distance sleeves, nuts and washers, small spare parts kit, information document	2085131
Mounting kit consisting of: nuts, washers	2018184
	2076717
Sopas Service Kit consisting of: RS485 adapter, USB 2.0 cable, connection cable	2097408

Device protection (mechanical)

Protective housings and protective pipes

Brief description	Part no.
Weather proof cover, Aluminum, painted	2702407
Weather proof cover for Dusthunter with nominal length > 735 mm (28.94"), Aluminum, painted	7047582
Weather hood for analyzer, stainless steel 1.4301	2047253
Weather proof cover for external blower unit, Aluminum, painted	2084180

Flanges

Weld-in flange

Brief description	Pitch circle diameter	Thread size	Part no.
Flange with tube, inner diameter 125 mm (4.92"), nominal length 800 mm (31.49"), Structural steel 1.0037	150 mm (5.9")	M12	7047580
Flange with tube, inner diameter 70.2 mm (2.76"), nominal length 500 mm (19.69"), Stainless steel 1.4571	100 mm (3.9")	M10	2017850
Flange with tube, inner diameter 70.2 mm (2.76"), nominal length 130 mm (5.12"), Stainless steel 1.4571	100 mm (3.9")	M10	2017846
Flange with tube, inner diameter 70.2 mm (2.76"), nominal length 130 mm (5.12"), 1.0254	100 mm (3.9")	M10	2017845
Flange with tube, inner diameter 70.2 mm (2.76"), nominal length 240 mm (9.45"), Stainless steel 1.4571	100 mm (3.9")	M10	2017848
Flange with tube, inner diameter 70 mm (2.76"), nominal length 500 mm (19.69"), Structural steel 1.0037	100 mm (3.9")	M10	2076714
Flange with tube, inner diameter 123 mm (4.84"), nominal length 1,100 mm (43.31"), Structural steel 1.0037	150 mm (5.9")	M12	7047581
Flange with tube, inner diameter 70.2 mm (2.76"), nominal length 500 mm (19.69"), 1.0254	100 mm (3.9")	M10	2017849
Flange with tube, inner diameter 70.2 mm (2.76"), nominal length 240 mm (9.45"), 1.0254	100 mm (3.9")	M10	2017847

Plug connectors and cables

Connecting cables

Brief description	Part no.
Connection cable for optional I/O module, for connecting several modules	2040977
Connection cable, slave, for connection of S/E units, 5-wire, 10 m (393.70")	7042018
Connection cable, slave, for connection of S/E units, 5-wire, 5 m (196.85")	7042017

Other connectors and cables

Brief description	Part no.
CAN extension cable, 6-wire, 15 m (590.55")	2020439
CAN extension cable, 6-wire, 5 m (196.85")	2020437
CAN extension cable, 6-wire, 10 m (393.70")	2020438
CAN bus cable, 6-wire, 12 m (472.44")	2020861

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