

# Online particle monitor OPM II

Type OPM II

RE 51460

Edition: 2021-04



- ▶ Nominal pressure up to 420 bar dynamic / 600 bar static
- ▶ Nominal flow 50 to 400 ml/min
- ▶ Operating temperature -20 to +80 °C



## Features

The OPM II is a visual online particle monitor that operates on the light-extinction principle.

The degree of contamination and the purity trend of fluids can be accurately monitored and documented. An alarm triggered when limit values are exceeded allows a fast reaction.

- ▶ Cleanliness class display according to ISO 4406:99 or SAE AS4059E
- ▶ Suitable for mineral and bio-oils; diesel fuel
- ▶ Easily configurable from the display; has an integrated data memory

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## Ordering code

### Basic device

Material no.	Type key	Basic device
R928052298	OPM II – 1X – M	Online particle monitor OPM II (basic device with NBR seal)
R928052660	8874-19-01.03-BR	Software for PC evaluation

### Accessories for hydraulic connections

Material no.	Type key	Accessories for hydraulic connections
R928052661	2103-A0-02.00	Flow controller with screen 125 µm (pressure window at 30 cSt: 2 ... 300 bar)
R900025012	ANSCHLUESSTUECK AB20-11/C G1/4"	Direct connection 1620 ISO228-G1/4 inside
R900981026	SCHLAUCH AB20-11/630-630BAR	Hose DN2, 2x screw connection m16x2, length 630 mm
R900083425	SCHLAUCH AB20-11/1000-630BAR	Hose DN2, 2x screw connection m16x2, length 1000 mm
R900054614	SCHLAUCH AB20-11/2000-630BAR	Hose DN2, 2x screw connection m16x2, length 2000 mm
R900033690	SCHLAUCH AB20-11/630-G1/4	Hose DN2, with hose connection M16x2 and pressure gauge connection G1/4, length 630 mm
R900033691	SCHLAUCH AB20-11/1000-G1/4	Hose DN2, with hose connection M16x2 and pressure gauge connection G1/4, length 1000 mm
R900033693	SCHLAUCH AB20-11/2000-G1/4	Hose DN2, with hose connection M16x2 and pressure gauge connection G1/4, length 2000 mm

### Accessories for electrical connections

Material no.	Type key	Accessories for electrical connections
R928052662	8812-00-00.38	Power supply unit M12x1; socket 8-pole BU, with 4x country adapter
R913023441	VERTEILERSTUECK 8808-50-01.03	Y distributor, M12x1, 8-pole, socket to connector/socket
R928052663	8824-T4-02.00-BR	USB-CAN adapter with cable for connection to PC (connector M12x1, 8-pole - USB connector - cable length 2 m)
R913002642	LEITUNGSDOSE 8P 7000-17121-2911000	Connection (CAN) to existing system environment (measuring cable M12x1; straight socket, 8-pole/open end - cable length 10 m)
R901351431	LEITUNGSDOSE 7000-17141-2911000	Connection (CAN) to existing system environment (measuring cable M12x1; angled socket, 8-pole/open end - cable length 10 m)

## Function, section

The **OPM II** is a visual particle monitor that operates on the light-extinction principle.

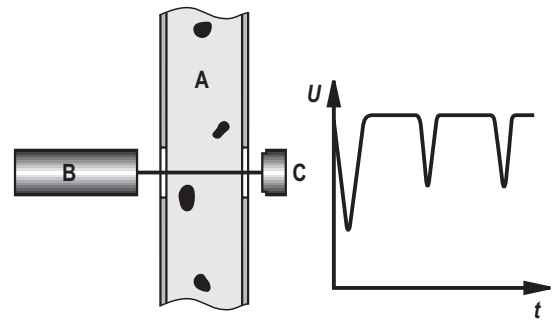
It consists of a flown-through measuring cell (A), a laser (B) and a photo diode (C). The laser radiates through the measuring cell and hits the photo diode. If a particle passes through the laser beam, the intensity reflected by the photo diode is reduced. The larger the particle, the less intensive the reflected light.

Using the **OPM II**, the level of contamination and the purity trend of non-aggressive fluids can be monitored. Potential variations in the absolute accuracy compared to particle counters calibrated according to ISO 11171:99 are below an ordinal number.

Due to the continuous purity monitoring, changes in a system are quickly identified and consequential damage can be avoided.

The cleanliness class is optionally displayed according to ISO 4406:99 or SAE AS4059E.

The device measures the temperature on the electronic circuit board and has an operating hours counter. After the current interruption, the counter re-starts counting at the last stored time value before the interruption.



## Accessories

The OPM II can be integrated into external systems or operated alone. There is the possibility to transfer the data to a PC and analyze it there.

### Integration of the OPM II into an external system:

- ▶ OPM II (basic device)
- ▶ Connection (CAN) to an external control system
- ▶ Hydraulic connections

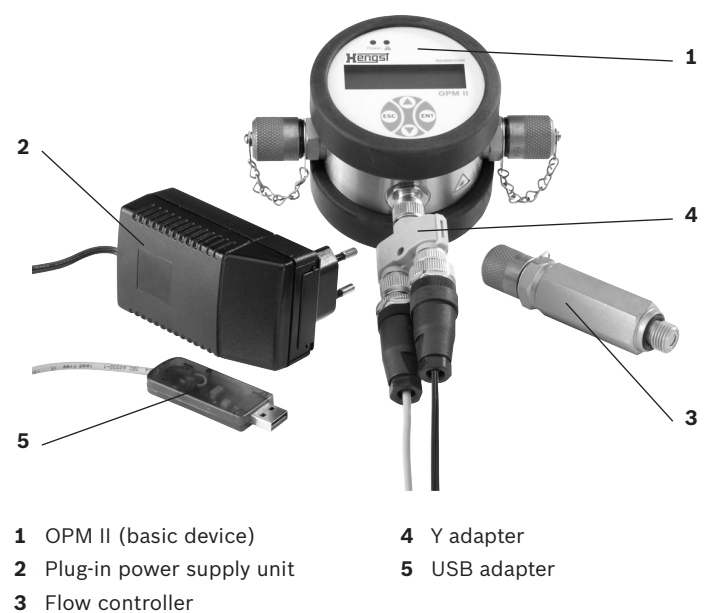
### Operation of the OPM II as stand-alone variant:

- ▶ OPM II (basic device)
- ▶ Plug-in power supply unit with country adapters
- ▶ Hydraulic connections

### OPM II to PC for the read out of data:

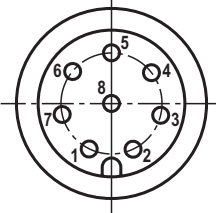
- ▶ Y distributor (for simultaneous connection of plug-in power supply unit and USB-CAN adapter)
- ▶ USB-CAN adapter with cable for connection to PC
- ▶ PC software for evaluation

## OPM II and accessories



**Technical data**

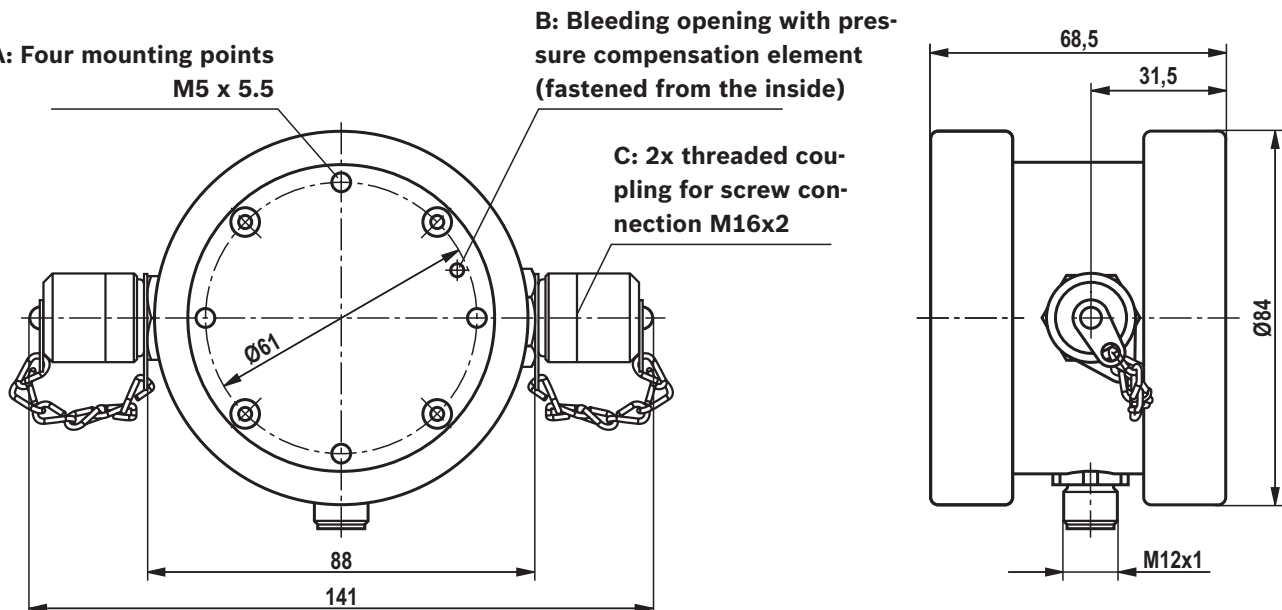
(For applications outside these parameters and high vibration loads, please consult us!)

Pin assignment	Designation	No.	Function
 M12x1 8-pole	+UB (24 VDC)	1	Supply
	GND	2	Ground
	CANL; TxD	3	CAN bus; transmitting
	CANH; RxD	4	CAN bus; reading
	NC; digital input	5	-
	IOUT1	6	4 ... 20 mA
	Open collector, alarm out	7	Alarm output
	SGND	8	Signal ground

Operating conditions	- Admissible operating pressure	bar [psi]	420 [6091] (dynamic)/600 [8702] (static)
	- Ambient temperature	°C [°F]	-20 ... 80 [-4 ... 176]
	- Humidity	%	0 ... 95
Fluids	- Admissible fluids		Mineral and ester fluids; poly-alpha-olefins
	- Temperature fluid	°C [°F]	-20 ... 80 [-4 ... 176]
	- Fluid connections		2x threaded coupling AB20-11/K1 G1/4
	- Admissible flow	ml/min	50 ... 400
Wetted materials			Stainless steel, sapphire, NBR
Sealing material			NBR
Voltage supply	V DC		9 ... 36
Current consumption	mA		Max. 300
Current outputs	mA		4 ... 20
Interfaces			RS 232, CANopen
Alarm contact			Open collector output
Electrical connection			8-pole connector M12x1
Measurement range according to ISO 4406:99			0 ... 24 (ordinal number)
Calibrated measurement range			10 ... 22 (ordinal number)
Measurement accuracy			±1.0 (ordinal number)

**Dimensions**

(dimensions in mm)



## Components

### Supply/discharge fluid (1) (6)

The device is equipped with two threaded couplings for screw connection M16x2. Hoses with measuring ports are usually connected here by means of which the particle counter is connected to the fluid-containing system. Adapters also allow for the conversion to G1/4 inside.

### Display (2) (5)

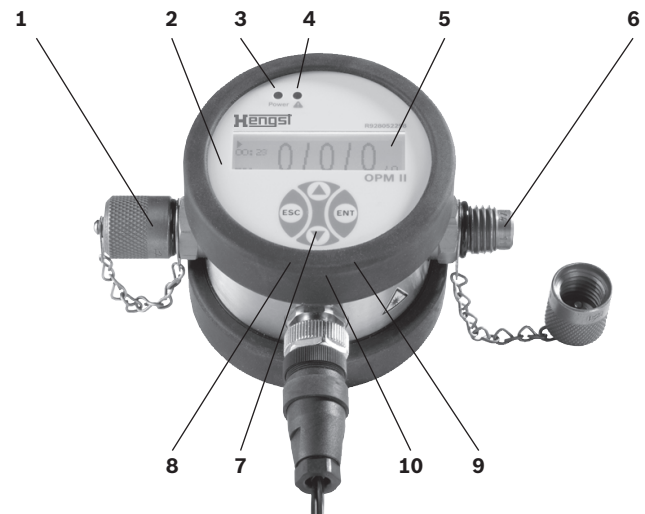
The front side of the device can be rotated by approx. 190° so that irrespective of the assembly, the display can always be positioned horizontally. The SW display shows the last determined cleanliness classes as well as the time until the next measurement and/or the remaining time of the measurement.

### "Power" indicator (3)

This indicator shows in green whether operating voltage is available.

### "Alarm" indicator (4)

This indicator shows in red that an alarm is pending. In the device, two alarms can be programmed.



- |                          |                   |
|--------------------------|-------------------|
| 1 Fluid supply           | 6 Fluid discharge |
| 2 Rotatable device front | 7 "Up" key        |
| 3 "Power" indicator      | 8 "Escape" key    |
| 4 "Alarm" indicator      | 9 "Enter" key     |
| 5 Display                | 10 "Down" key     |

## Assembly, commissioning, maintenance

### Please observe this information when determining the site of installation:

- ▶ Connect the OPM II to a pressure line using the T branch in the bypass.
- ▶ The flow direction is irrelevant.
- ▶ At the connection point, the pressure conditions should be as constant as possible. The pressure may vary, there must, however not be any pressure peaks or strong fluctuations.
- ▶ Connection to the control line is recommendable; alternatively, you can use the filter or cooling circuit.
- ▶ The flow should be constant and lie between 50 ... 400 ml/min.
- ▶ Flow control or pressure reduction units should always be installed downstream the particle counter as such equipment may create particles or air bubbles leading to measuring errors.
- ▶ If a pump is necessary to create the required flow, it should be of low-pulsation design and be installed upstream the particle counter. Otherwise, bubbles might be created in case of arrangement on the suction side leading to measuring errors.

### Please also observe the following information before the installation:

- ▶ Ensure during installation that afterwards, the display will be easily readable. For simplification, the display can be rotated by approx. 190°.
- ▶ The following is true for connection lines: The shorter the better. With the length of the line, the risk of settlement of larger particles increases.
- ▶ Ensure particularly with higher viscosities and when using lines that the pressure is high enough in order to set a flow between 50 ... 400 ml/min.
- ▶ Make sure that the measured fluid is free from bubbles and drops. Bubbles and droplets in the oil can mostly be identified from very high ordinal numbers and/or identical ordinal numbers in different size channels. Such bubbles and droplets are hardly visible to the naked eye.
- ▶ Warranty becomes void if the delivered item is changed by the ordering party or third parties or improperly mounted, installed, maintained, repaired, used or exposed to environmental condition that do not comply with the installation conditions.

## Directives and standardization

### Product validation

Hengst products are developed, manufactured and assembled as part of a certified quality management system in accordance with ISO 9001:2000. The relevant standards and directives can be found in the CE Declaration of Conformity.

Hengst Filtration GmbH  
Hardtwaldstr. 43  
68775 Ketsch, Germany  
Phone +49 (0) 62 02 / 6 03-0  
hydraulicfilter@hengst.de  
www.hengst.com

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