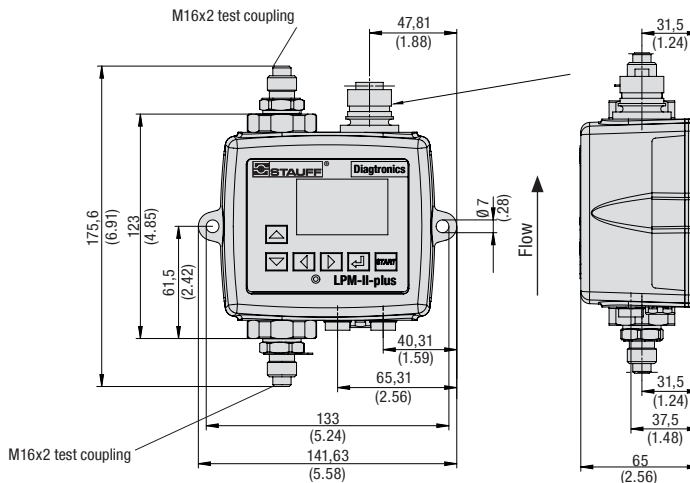


## Particle Monitor - LPM-II-plus



### Product Description

The LPM-II-plus Particle Monitor determines the contamination level of the measured fluid on eight size channels and offers precise and complete determination of particle sizes in accordance with international standards.

The LPM-II-plus is an automatic, optical particle counter with high-performance LEDs that work on the light obscuration principle. STAUFF recommends recalibrating the measuring equipment at regular intervals.

- Multicolour indicators via LCD (K versions) and LED with output alarm signals as standard
- Secondary connector to allow the simultaneous control/download of results during operation
- 4-20mA analogue output as standard (time multiplex)

### Options

- Moisture sensor / temperature sensor: RH in % (relative humidity) and temperatures in °C
- Phosphate Ester- (e.g. Skydrol®) and Water Glycol-compatible devices are available on request
- USB Port for Data transfer (optional)

### Technical Data

#### Channels

- >4, 6, 14, 21, 25, 38, 50, 70 µm(c) according to ISO 4406:1999

#### Measuring Range / Purity Classes

- ISO 4406:1999 Code 0 to 25, NAS 1638 Class 00 to 12, AS4059 Rev. E. Tables 1 and 2 Sizes A-F: Classes 000 to 12, ISO 11218 Classes 00 to 12 (lower codes or classes are test time-dependent)

#### Precision

- ±1/2 Code for 4, 6, 14 µm(c)
- ±1 Code for larger particles

#### Calibration

- Each device is individually calibrated using ISO Medium Test Dust (MTD) in accordance with ISO 11171 (1999);

#### Flow

- 20 ... 400 ml/min / 0.005 ... 0.11 US GPM

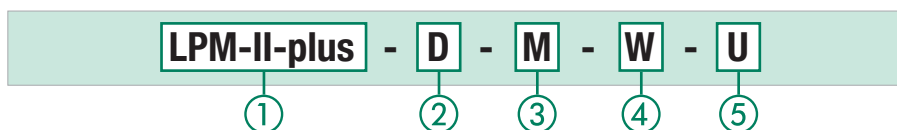
#### Viscosity Range

- ≤ 1000 mm<sup>2</sup>/s

#### Medium Temperature

- -25 °C ... +80 °C / -13 °F ... +176 °F \*pressure-dependent

### Order Codes



#### ① Series and Type

Particle Monitor (Incl. LPM-II-CAB-P-FL-3 connecting cable) **LPM-II-plus**

#### ② Version

With display and keypad **D**  
Without display and keypad **O**

#### ③ Fluid Compatibility

Fluids based on Mineral Oil and Petroleum (standard) **M**  
Phosphate Ester (e.g. Skydrol®) **E**  
Specific Water Glycols **G**

Note: If you have any queries on fluid compatibility, please contact STAUFF.

#### Ambient Temperature

- LMP II-O: -25 °C ... +80 °C / -13 °F ... +176 °F
- LMP II-D: -25 °C ... +55 °C / -13 °F ... +131 °F

#### Weight

- 1,6kg / 3.53 lbs

#### Fluid Compatibility

- M: suitable for Synthetic and Mineral Oil based fluids, Diesel and Petroleum
- G: Austenitic Stainless Steel, FKM (Viton®): suitable for offshore and aqueous fluids
- E: Austenitic Stainless Steel, Perfluorinated Rubber (FFKM): suitable for Phosphate Ester and aggressive media

#### Max. Permissible Operating Pressure

- 420 bar / 6091 PSI static \*temperature-dependent (Note: In systems with extreme pressure peaks, please contact STAUFF)

#### Test Duration

- Settable between 10 ... 3600 sec., set ex-works to 120 sec.
- As standard with start delay and freely programmable test intervals

#### Moisture Sensor / Temperature Sensor

- % RH (relative humidity) ±3 %
- ±3 °C / ±32 °F

#### Volumetric Flow Measurement

- As display only

#### Hose Connections

- Test coupling STAUFF Test 20 or comparable (M16 x 2)

#### ④ Moisture Sensor / Temperature Sensor

Without moisture sensor / temperature sensor **O**  
With moisture sensor / temperature sensor **W**

#### ⑤ Interface

USB interface to transfer measured data to a data carrier **U**

Note: In the case applications with extreme pressure peaks, please contact STAUFF.

Note: Versions "E" and "G" can only be supplied without moisture sensor / temperature sensor

Note: You need an interface module with either a USB or an Ethernet interface for exporting and programming.

#### Data Storage

- Max. 4000 measuring results

#### Interfaces

- RS485, RS232, Modbus, CAN Bus
- 4-20 mA time multiplex interface
- USB interface to transfer measured data to a data carrier (optional)

#### International Protection Rating

- IP 65/67: Dust-proof and protected from spray
- Impact resistance rating IK04

#### Power Supply / Power

- 9 ... 36 V DC, < 2.2 W (connecting cable with flying leads is included)

#### Current Consumption

- 12 V: 70 mA (LPM-II-plus-O), 150 mA (LPM-II-plus-D)
- 24 V: 40 mA (LPM-II-plus-O), 80 mA (LPM-II-plus-D)
- 36 V: 30 mA (LPM-II-plus-O), 60 mA (LPM-II-plus-D)

#### Housing Surface Treatment

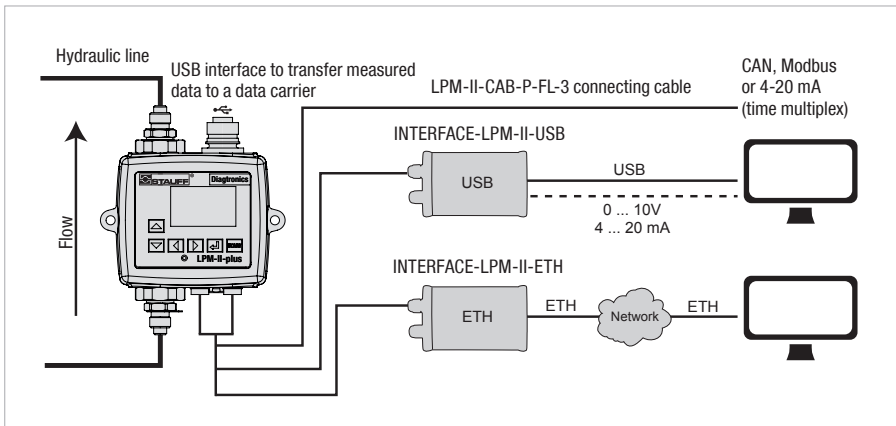
- Polyurethane based paint, according to BSX34 colour BS381-638 (dark sea grey)
- Tested according to: BS2X34A and BS2X34B, MMO114 and SP-J-513-083 Part II. Cl. A
- The unit meets: MIL-PRF-85285

#### Wetted parts

- M: C46400 Cu Alloy, 316 Stainless Steel, FKM (Viton®), FR4, Sapphire
- G: 316 Stainless Steel, FKM (Viton®), Sapphire
- E: 316 Stainless Steel, Perfluorinated Rubber (FFKM), Sapphire, EPDM



Interface Module with USB or Ethernet Interface ▪ INTERFACE -LPM-II-USB/ETH



Connection diagram: PC connection of the LPM-II-plus Particle Monitor

Order Code

**INTERFACE-LPM-II-USB**



① Series and Type

- Interface module with USB interface **INTERFACE-LPM-II-USB**
- Interface module with USB interface **INTERFACE-LPM-II-USB-010V**
- Interface module with USB interface **INTERFACE-LPM-II-USB-420A**

Scope of supply:

- Power supply unit
- Interface module with USB interface
- Connecting cable (3 m / 9.84 ft)
- USB cable

Order Code

**INTERFACE-LPM-II-ETH**



① Series and Type

- Interface module with Ethernet interface **INTERFACE-LPM-II-ETH**

Scope of supply:

- Power supply unit
  - Interface module with Ethernet interface
  - Connecting cable (3 m / 9.84 ft)
- Note: An Ethernet cable is not supplied.

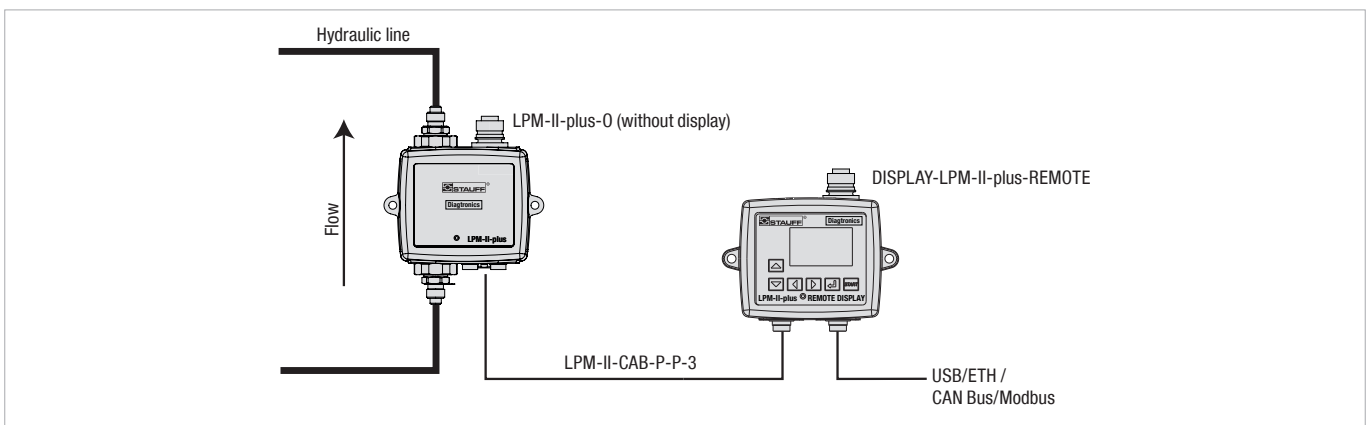
Product Description

The LPM-II-plus is connected to an EDP system or a laptop/PC using an interface module with a USB or an Ethernet interface. Either interface module is connected to the LPM-II-plus using a connecting cable (3 m / 9.84 ft). With the power supply unit connected, the LPM-II-plus is supplied with current via the connecting cable. The interface modules allow you to evaluate the measured data and to carry out programming using the supplied software. In USB operation, the LPM-II-plus can be supplied with current via the USB cable too.

The USB interface is optionally also available with additional 0-10 V or 4-20 mA outputs. The 0-10 V interface provides six ISO channels, the relative humidity and the temperature on eight voltage outputs. The 4-20 mA version, on the other hand, supplies e.g. the NAS code and the relative humidity on two outputs.

The optional USB interface enables the direct transfer of measurement data to a USB data medium.

Remote Display Unit ▪ DISPLAY-LPM-II-plus-REMOTE



Connection diagram: Remote display

Order Code

**DISPLAY-LPM-II-plus-REMOTE**



① Series and Type

- DISPLAY-LPM-II-plus-REMOTE**

Scope of supply:

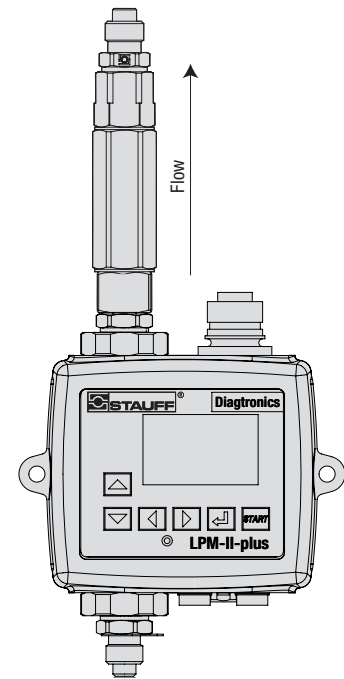
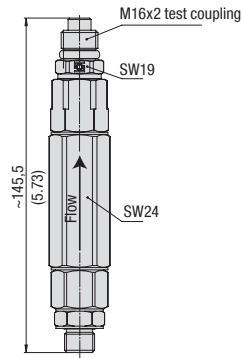
- Remote Display
- LPM-II-CAB-P-P-3 connecting cable

Product Description

In the case of applications outside the operator's field of view or in locations that are difficult to access, it is possible to display via a remote display the values that the LPM-II-plus measured.



### Flow Control Valve - LPM-II-DAV



LPM-II-plus with flow control valve LPM-II-DAV

#### Product Description

In systems in which the volumetric flow or the pressure is too high, the optimum flow is achieved with the use of a flow control valve.

It can process pressures from 4 bar ... 400 bar / 58 PSI ... 5801 PSI.

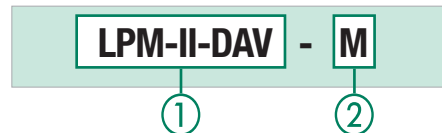
The LPM-II-DAV, flow control valve is connected to the hydraulic outlet of the LPM-II-plus via the connection fittings.

#### Max. Permissible Operating Pressure

▪ 400 bar / 5801 PSI

(Note: Note that a minimum operating pressure of 4 bar / 58 PSI must be maintained for the proper function of the flow control valve.)

#### Order Code

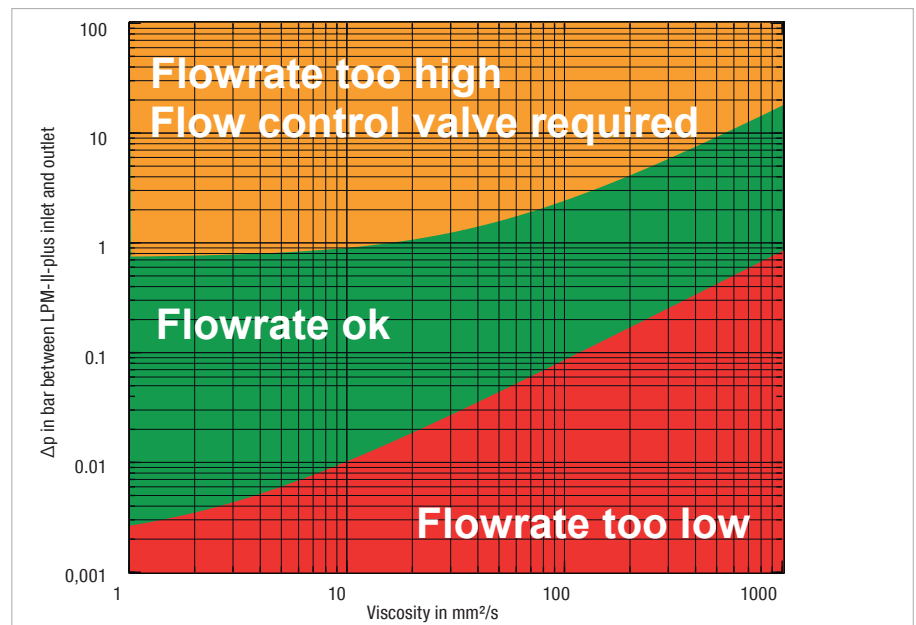


#### ① Series and Type

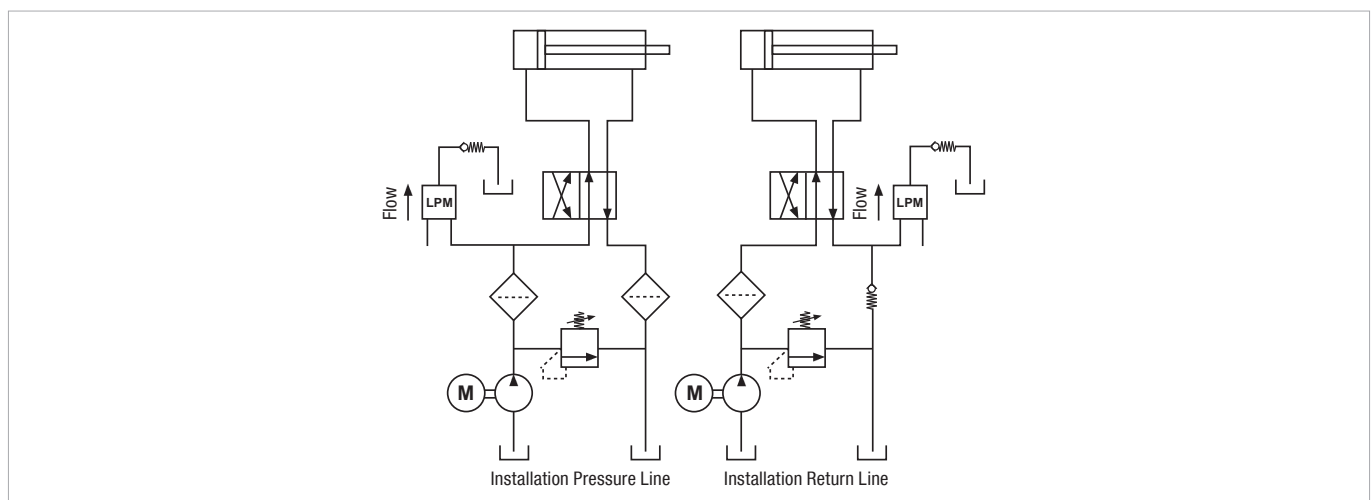
Flow Control Valve **LPM-II-DAV**

#### ② Fluid Compatibility

Fluids based on Mineral Oil and Petroleum (standard)	<b>M</b>
Phosphate Ester (e.g. Skydrol®)	<b>E</b>
Specific Water Glycols	<b>G</b>



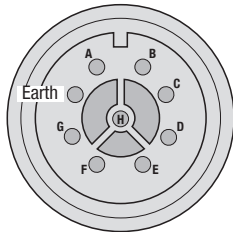
#### Application example



## Particle Monitor ■ LPM-II-...-CX

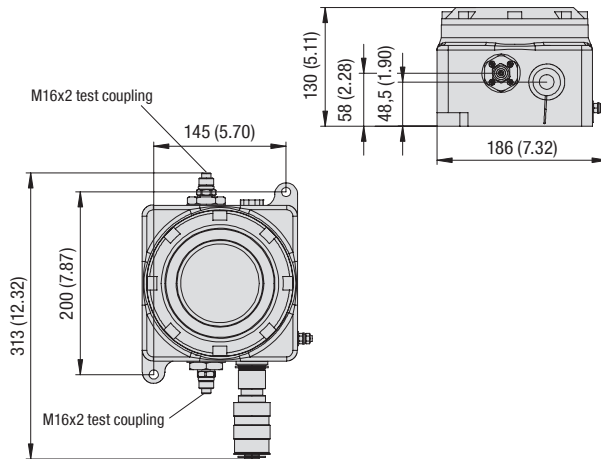
## Wiring Diagram

Note: Please note that an ATEX approved connecting cable is not included in the scope of delivery of LPM-II-0-...-CX. A corresponding ATEX plug is included.

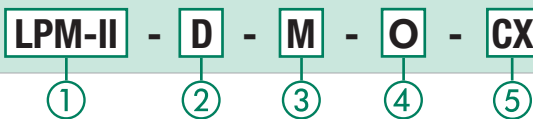


View when looking at supplied male connector

- A Data-
- B Data+
- C Power 0V
- D Power +9V-36V DC
- E Output 1
- F Output 2
- G Common
- H Start



## Order Codes



## ① Series and Type

Particle Monitor **LPM-II**

## ② Version

With display **D**

## ③ Fluid Compatibility

Fluids based on Mineral Oil and Petroleum (standard) **M**  
 Phosphate Ester (e.g. Skydrol®) **E**  
 Specific Water Glycols **G**

Note: If you have any queries on fluid compatibility, please contact STAUFF.

## ④ Moisture Sensor / Temperature Sensor

Without moisture sensor / temperature sensor **O**  
 With moisture sensor / temperature sensor **W**

## ⑤ Version according to ATEX 94/9/EG

ATEX certification (Zone 2 / Cat. 3G) **CX**

Note: Versions „E“ and „G“ can not be supplied with moisture sensor / temperature sensor.

Note: You need an interface module with either USB or an ethernet interface for exporting and programming. The USB interface is not ATEX rated.

## Product Description

The ATEX version of the Particle Monitor LPM-II is approved for use in hazardous areas (zone 2 / category 3G). The device thus meets the conditions to be used in e.g. oil and gas industry or chemical and process industry.

## Product Features

- Determines contamination level of measured fluids in 8 size particle channels
- Precise and complete determination of particle sizes in accordance with international standards
- Integrated data storage for up to 4000 measuring results
- Integrated Modbus and CAN Bus interfaces can be used to connect the device to existing machine control, and data acquisition systems
- Option to specify different alarm thresholds
- Software on CD (included)
- ATEX compliant (Zone 2 / Category 3G)

## Technical Data

## Channels

- >4, 6, 14, 21, 25, 38, 50, 70 µm(c) acc. to ISO 4406:1999

## Measuring Range / Purity Classes

- ISO 4406:1999 Code 0 to 25, NAS 1638 classes 00 to 12, AS4059 Rev. E. tables 1 and 2 sizes A-F: classes 000 to 12, ISO 11218 classes 00 to 12 (lower codes or classes are test time-dependent)

## Accuracy

- ±1/2 code for 4, 6, 14 µm(c)
- ±1 code for larger particles

## Calibration

- Each device is individually calibrated using ISO Medium Test Dust (MTD) in accordance with ISO 11171 (1999)

## Flow

- 20 ... 400 ml/min / .005 ... .11 US GPM

## Viscosity Range

- ≤ 1000 mm<sup>2</sup>/s

## Temperature Range

- Media: -25 °C ... + 80 °C / -13 °F ... +176 °F
- Ambient: -5 °C ... +80 °C / +23 °F ... +176 °F

## Weight

- 5,5 kg / 12.16 lbs

## Power Supply

- 9 ... 36 V DC

## Fluid Compatibility

- M: suitable for Synthetic and Mineral Oil based fluids, Diesel and Petroleum
- G: Austenitic Stainless Steel, FKM (Viton®): suitable for offshore and aqueous fluids
- E: Austenitic Stainless Steel, Perfluorinated Rubber (FFKM): suitable for Phosphate Ester and aggressive media

## Max. Permissible Operating Pressure

- 400 bar / 5801 PSI (Note: In systems with extreme pressure peaks, please contact STAUFF)

## Test Duration

- Settable between 10 ... 3600 sec., set ex-works to 120 sec.
- As standard with start delay and freely programmable test intervals

## Moisture Sensor / Temperature Sensor

- % RH (relative humidity) ±3 %
- ±3 °C / ±32 °F

## Volumetric Flow Measurement

- As display only

## Hose Connections

- Test coupling STAUFF Test 20 or comparable (M16 x 2)

## Data Storage

- Max. 4000 measuring results

## Interfaces

- RS485, RS232, Modbus, CAN Bus

## Current Consumption

- 12 V: 70 mA
- 24 V: 40 mA
- 36 V: 30 mA

## Power

- <2,2 W

## Housing Surface Treatment

- Polyester vinyl paint (light grey)
- Cast
- Stainless Steel
- Material spec.: ANC ABF/C

## Wetted Parts

- M: C46400 Cu Alloy, 316 Stainless Steel, FKM (Viton®), FR4, Sapphire
- G: 316 Stainless Steel, FKM (Viton®), Sapphire
- E: 316 Stainless Steel, Perfluorinated Rubber (FFKM), Sapphire, EPDM

## ATEX Directive 94/9/EG

Harmonises legal provisions of memberstates for devices and protection systems for designated use in potentially explosive areas.

## ATEX Classification

- CE Ex II 3G Ex nR IIB T6 X

## ATEX Rating

- Zone 2 / Cat. 3G

