LEADING IN
PRODUCTION
EFFICIENCY

Filter LP

Cartridge Filter

Operation manual

MFT00001EN, V06

M16090114, M16090115, M16090124

www.durr.com

Information about the document

This document describes the correct handling of the product.

- Read the document prior to every activity.
- Prepare the document for the application.
- Pass on the product only together with the complete documentation.
- Always follow safety instructions, handling instructions and specifications of every kind.
- Illustrations can deviate from the technical construction.

Validity range of the document

This document describes the following products:

M16090114 Filter LP 10" FLP-10-28-SST-CF-DN25	
M16090115 Filter LP 5" FLP-5-28-SST-CF-DN25	
M16090124 Filter LP 20" LP-20-28-SST-CF-DN25	

Hotline and Contact

If you have queries or would like technical information, please contact your dealer or sales partner.

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1 Product overview

1.1 Overview

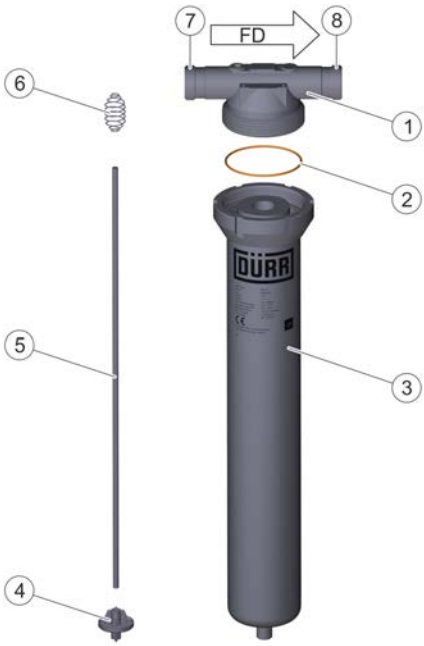

Fig. 1: Overview (M16090124)

1 Filter lid
2 O Ring
3 Filter sump
4 Pressure nut
5 Guide rod
6 Spring
7 Material inlet
8 Material outlet
FD Flow direction

1.2 Short description

The filter housing including filter element (hereafter called “Filter”) ensures in the supply line of an application layer that no undesired particles or impurities will arise in the subsequent process flow.

2 Safety

2.1 Presentation of Notes

The following notes can appear in this instruction:

DANGER!

High risk situation that can lead to serious injuries or death.

WARNING!

Medium risk situation that can lead to serious injuries or death.

CAUTION!

Low risk situations that can lead to minor injuries.

NOTICE!

Situations that can lead to material damage.

ENVIRONMENT!

Situations that can lead to environmental damage.

Additional information and recommendations.

2.2 Intended Use

Use

The LP filter is meant exclusively for filtration of paints and colors in application stations.

Use filter only for media for which it is intended. Ensure that the filter and the sealing material are suitable for the media.

The filter is approved for use in Ex zones 1 and 2. The fluids used must conform to the explosion group IIB.

Fluently operate the filter systems of this series exclusively with media of the fluid group 1.

The filter is intended for use in industry and trade only.

The filter may only be used within the approved technical data 11 “Technical data”.

Misuse

If used improperly, it can cause serious injuries.

Examples of wrong use are:

- Use in Ex zone 0
- Use along with hand guided atomizers
- Use of unapproved materials, see safety data sheets.
- Operating with gases and solids
- Making conversions or changes on your own

EX labeling

Ex II 2G Ex h IIB T4 Gb X

II - Device group II: all areas except mining

2G - Device category 2 for gaseous atmosphere

Ex h - Ignition protection category for non-electrical devices

IIB - Explosion group IIB

T4 - Temperature class

Gb - Device protection level: Zone 1

X - Restriction: The device is configured for operation in an ambient temperature of 15°C to 40°C.

2.3 Residual risks

Escaping material

Material escaping under pressure can cause serious injuries.

Before working on the product:

- Disconnect the system, in which the product is installed, from compressed air and material supply.
- Depressurize the lines.
- Secure the system against being switched on again.

Electrostatic charging

If the product is not grounded, there can be an electrostatic charge on the product. Electrostatic discharge can cause sparks. In an explosive atmosphere, these sparks can prove to be the source of ignition for an explosion. Serious injury and death could be the consequence.

- Ground the product as specified.
- Measure grounding resistance.
- Let the housing to rest for 45 minutes.

Hot surfaces

During normal operation the surfaces of components can get extremely hot. Contact with it can cause burns.

Before carrying out any work:

- Check the temperature.
- Do not touch hot surfaces.
- Let components cool down.
- Wear protective gloves.

Danger from harmful or irritant substances

Serious injuries or death can result if you come into contact with dangerous fluids or steam.

- Filter Check regularly for leakage. Observe local regulations and maintenance schedule.
- Ensure that the forced ventilation is operational.
- Follow the safety data sheet.
- Wear specified protective equipment.

2.4 Conduct in the event of a hazardous situation

Conduct in case of danger depends on the operator's installation situation.

Perform the following activities:

- Close lines.
- Secure against reconnection.
- Depressurize lines.

2.5 Staff qualification

WARNING!

Inadequate qualification

Wrong estimation of dangers can cause serious injury or death.

- Only sufficiently qualified persons may execute all work.
- Some work requires additional qualification. Additional qualifications of specialized personnel are marked with a "+".

This document is intended for qualified personnel in industry and craftmanship.

Cleaning staff

The cleaning staff receives regular instructions from the operator about the following contents:

- Using the product
- Handling cleaning tools
- Handling cleaning agents
- Technical Measures for occupational safety and health

Mechanic

The mechanic is trained specifically for the field of work in which he works.

Furthermore, he has the following knowledge:

- Guidelines, Standards and Rules of Engineering
- Local conditions
- Technical Measures for occupational safety and health

The mechanic is responsible for the following activities on equipment and components:

- Assembly
- Waiting
- Maintenance
- Disassembly

+ additional qualification explosion protection

In addition to the knowledge of the various specialist fields, the mechanic has knowledge of regulations and safety measures when working in potentially explosive areas.

Dürr Systems offers special product training for ↳ "Hotline and Contact".

2.6 Personal protective equipment

When working in explosive areas, the protective clothing, including gloves, must meet the requirements of DIN EN 1149-5. Footwear must meet the requirements of EN ISO 20344 and EN IEC 61340-4-3. The volume resistivity must not exceed 100MΩ.

Wear the specified personal protective equipment when working. Provide the following personal protective equipment:

Anti-Static Safety Boots
Protect feet from crushing, falling items and slipping on slippery ground.

Moreover, anti-static safety boots reduce electrostatic charge by discharging the electrostatic charges.

Eye protection
Protects eyes from dust, paint drops and particles.

Protective gloves
Protect the hands from:
- mechanical forces
- Thermal forces
- Chemical effects

Protective workwear
Tight fitting workwear with low tear strength, tight sleeves and no hanging parts.

3 Transport, scope of supply and storage

3.1 Scope of delivery

The scope of supply includes the following components:
- Filter
- Filter insert (replacement)
- O-ring (replacement)

Inspect delivery on receipt for completeness and integrity.

Report defects immediately ↳ “Hotline and Contact”.

3.2 Handling of packaging material

ENVIRONMENT!

Incorrect disposal

Incorrectly disposed packaging material can damage environment.
- Dispose of material no longer required in an environment-friendly manner.
- Observe local disposal specifications.

3.3 Storage

Storage provisions:
- Do not store outdoors.
- Store Filter only when dry.
- Store in a dust-free place.
- Do not expose to aggressive media.
- Protect from solar radiation.
- Avoid mechanical vibrations.
- Temperature: 10°C to 40°C
- Relative humidity: 35% to 90%

4 Assembly

4.1 Requirements for the Installation point.

- Use of a system that prevents opening under pressure is recommended.
- It must be possible to interrupt compressed air supply and to secure it against reconnecting.
- The infeed must be adjustable.
- Lines, seals and screw connections must be designed for the requirements of the filter.
- The filter must be accessible for maintenance work and operation monitoring.
- Provide pressure release device to avoid excess pressure.
- Use suitable holding fixtures and support fixtures for the pipe connections from and to the filter housing to avoid external loads.

4.2 Assembly

Observe the following at assembly:

- Observe flow direction, which is recognizable from an arrow on the filter lid.
- Install filter housing in the filter system in a standing position.
- Provide shut off valves.
- Install locking fittings in the connection lines that allow secure locking while working on the pressure housing.
- Take technical measures to ensure that the approved operating parameters (pressure, temperature) cannot be exceeded.
- Ensure that the filter lid for sealing is seated perfectly. Rule out any uncontrolled leak of fluids under pressure. Design the piping of all valves such that the fluid is drained and any endangerment of the maintenance staff and of the environment is ruled out.
- The connected pipelines must not transfer any mechanical stresses to the filter.
- Provide sufficient clearance above the filter for maintenance work.

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Protective gloves
- Eye protection
- Protective workwear
- Anti-Static Safety Boots

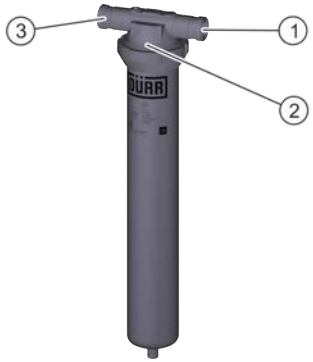

Fig. 2: Assembling Filter

Assembling Filter:

1. Connect material inlet (3) with the pipeline system by using a sealing ring.
2. Connect material outlet (1) with the pipeline system by using a sealing ring.
3. Close filter lid (2).
4. Check supply line for tightness.

5 Commissioning

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Protective workwear
- Eye protection
- Protective gloves
- Anti-Static Safety Boots

Take the following into consideration at the time of commissioning:

WARNING!

Opening a container under pressure poses is a danger of injury.

If the filter is opened under pressure, there can be danger of injury.

- Do not open the closure as long as the filter housing is under pressure.

- Perform a tightness test at 1.5 times the operating pressure of 28 bar = 42 bar, after every commissioning.
- Ensure that entry valve and exit valve (if provided by operator) are closed and the discharge valve (if provided by operator) is closed or the drain screw is tightened.
- While the housing fills up, air escapes from the vent. If all air has escaped, fluid escapes through the vent. For safety reasons, check vent valve and drain valve (if provided by operator). Collect escaping fluid in a suitable tank. Take appropriate measures when handling hazardous fluid.
- The filter must be vented after opening the filter every time and at each commissioning, to maintain high efficiency of the filter. Observe the following points for safety reasons:
  - Perform venting only through the venting screw.
  - Open venting screw very carefully.
  - Guide the escaping fluid to a drain or a tank. Take special measures when handling hazardous fluid.
- Operate filter up to a differential pressure on filter of about 1.5 bar (21.8 psi). Replace the filter cartridge after the differential pressure is exceeded.

Fig. 3: Position of the bleeder screw

1. Open venting screw (1).
2. Slowly open entry valve (if provided by operator). Ensure that the exit valve (if provided by operator) remains closed.
3. Close venting screw (1).
4. Slowly open exit valve (if provided by operator).
   ⇨ The filter is in operation. Pressure builds up inside the filter.
5. Perform a tightness test at 1.5 times the operating pressure of 28 bar = 42 bar.

6 Operation

6.1 Safety recommendations

WARNING!

Hot surfaces

In operation, the surfaces of the product can heat intensely. Contact can cause burn injuries.

- Wear protective hand gloves.

6.2 Rinsing

The filter is purged by using the purging program of the total system.

7 Cleaning

7.1 Safety recommendations

WARNING!

Danger of fire and explosion

Flammable coating materials and their detergents and cleaning agents can cause a fire or an explosion.

- Ensure that the flashpoint of the fluid is at least 15K above the ambient temperature.
- Only electrically conductive containers may be used for the cleaning fluid. Containers must be grounded.
- Note explosion group of the fluid.
- Follow the safety data sheet.
- Ensure that forced ventilation and fire protection equipment are in operation.
- Do not use sources of ignition and open light.
- Do not smoke.
- Ground Filter.

WARNING!

Danger from harmful or irritant substances

Serious injuries or death can result if you come into contact with dangerous fluids or steam.

- Filter Check regularly for leakage. Observe local regulations and maintenance schedule.
- Ensure that the forced ventilation is operational.
- Follow the safety data sheet.
- Wear specified protective clothing.
- Avoid contact (e.g. with eyes, skin).

WARNING!

Sparks due to electrostatic discharge

If the product is not sufficiently discharged, there is a danger of explosion. Serious injury and death could be the consequence.

- Let the housing to rest for 45 minutes.

NOTICE!

Unsuitable cleaning agents

Unsuitable detergents can cause material damage.

- Only use cleaning agents approved by the material manufacturer.
- Follow safety data sheets.

NOTICE!

Unsuitable Cleaning Tools

Unsuitable cleaning tools can cause damage.

- Only use cloths, soft brushes and paintbrushes.
- Do not use abrasive cleaning tools.
- Do not use compressed air for cleaning.
- Do not use any thinner spray guns.
- Do not use high pressure for cleaning agents.

7.2 Cleaning

Personnel:

- Cleaning staff

Protective equipment:

- Protective workwear
- Protective gloves
- Eye protection
- Anti-Static Safety Boots

Requirements:

- System is switched off and secured against restart.
- There is no explosive atmosphere in potentially explosive zones.
- System has been purged.
- Lines are discharged and secured against being switched on again.
- Technical ventilation is switched on.

1. Clean the exterior of the filter using a piece of cloth wetted with a detergent. Suitable cleaning agents:
   - PVC thinner
   - Isopropanol
   - Cleaners for plastic protective sleeves

8 Maintenance

8.1 Safety recommendations

WARNING!

Risk of injury due to escaping material

Escaping compressed material can cause serious injury.

Before working on the product:

- Disconnect the system, in which the product is installed, from material supply system.
- Secure the system against being switched on again.
- Depressurize the lines.

WARNING!

Danger of fire and explosion

Flammable coating materials and their detergents and cleaning agents can cause a fire or an explosion.

- Ensure that the flashpoint of the fluid is at least 15K above the ambient temperature.
- Only electrically conductive containers may be used for the cleaning fluid. Containers must be grounded.
- Note explosion group of the fluid.
- Follow the safety data sheet.
- Ensure that forced ventilation and fire protection equipment are in operation.
- Do not use sources of ignition and open light.
- Do not smoke.
- Ground Filter.

WARNING!

Danger from harmful or irritant substances

Serious injuries or death can result if you come into contact with dangerous fluids or steam.

- Filter Check regularly for leakage. Observe local regulations and maintenance schedule.
- Ensure that the forced ventilation is operational.
- Follow the safety data sheet.
- Wear specified protective clothing.
- Avoid contact (e.g. with eyes, skin).

WARNING!

Sparks due to electrostatic discharge

If the product is not sufficiently discharged, there is a danger of explosion. Serious injury and death could be the consequence.

- Let the housing to rest for 45 minutes.

8.2 Maintenance schedule

If a maintenance assistant is used in the system visualizer, the maintenance intervals of the maintenance assistant are valid.

Interval	Maintenance work
Daily	Clean filter ↳ 7 “Cleaning”.
	Also check condition and tightness of the connections and lines.
	Check fastening.
	Check air leak and leakage of liquids.
Monthly	Check filter housing inside and outside for corrosion and wear.
	Lubricate threads with molybdenum-based lubricant.
Annually	Replace O-rings ↳ 8.3 “Dismantling”.
	Check closure for tightness and damage.

8.3 Dismantling

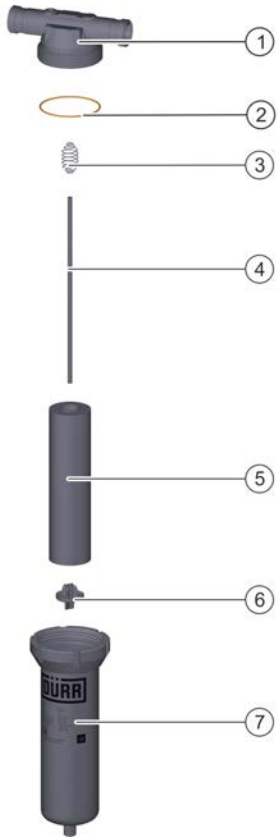

Fig. 4: Exploded view

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Protective gloves
- Eye protection
- Protective workwear
- Anti-Static Safety Boots

Requirements:

- Filter has been purged ↳ 6.2 “Rinsing”.
- Material supply system of the plant is discharged and secured against reconnection.
- Compressed air supply of the plant is discharged and secured against reconnection.
- Filter is depressurized ↳ 10.2 “Decommissioning”.

1. Unscrew filter sump (7) together with O ring (2) from filter lid (1) in counter-clockwise direction.
2. Take out O-ring (2) from the filter housing (7).
3. Unscrew pressure nut (6) from the guide rod (4).
4. Pull filter cartridge (5) from the guide rod (4). Remove guide rod (4) and spring (3).
5. Clean dirty places ↳ 7 “Cleaning”. Replace damaged components.

8.4 Assembly

Lubricate threads and seals before assembly.

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Protective gloves
- Eye protection
- Anti-Static Safety Boots
- Protective workwear

The position numbers relate to the Fig. 4.

1. Insert guide rod (4) with spring (3) in the filter lid (1).
2. Push filter cartridge (5) over the guide rod (4).

   Position filter cartridge (5) such that the spring (3) fixes the filter cartridge (5) on the filter lid.
3. Fit the pressure nut (6) on the guide rod (4). Tighten by hand.
4. Insert O-ring (2) in the seal groove above on the filter pump (7).
5. Screw filter sump (7) on the filter lid (1) in clockwise direction to lock the filter.

9 Faults

9.1 Defects table

Fault description	Cause	Remedy
Separation bad, flow rate too low	Filter cartridge soiled	Purge filter ↳ 6.2 “Rinsing”. Replace filter cartridge when necessary ↳ 8.3 “Dismantling”.
Material leak at material inlet or material outlet	Sealing ring damaged	Replace sealing ring ↳ 10.3 “Disassembly”.
Material leak at the housing closure	O-ring damaged	Replace O-ring ↳ 8.3 “Dismantling”.

10 Disassembly and Disposal

10.1 Safety recommendations

WARNING!

Risk of injury due to escaping material and compressed air

Escaping compressed material can cause serious injury.

Before carrying out any work:

- Disconnect the system, in which the filter is installed, from compressed air and material supply.
- Secure the system against being switched on again.
- Depressurize the lines.

10.2 Decommissioning

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Protective workwear
- Eye protection
- Protective gloves
- Anti-Static Safety Boots

Item number relates to the ↳ 5 “Commissioning”.

Take measures to collect the fluids existing from the drain or to direct them in a drain.

Depressurizing Filter

1. Close exit valve (if provided by operator).
2. Close entry valve (if provided by operator).

WARNING!

Opening a container under pressure poses is a danger of injury.

If the filter is opened under pressure, there can be danger of injury.

- Do not open the closure as long as the filter housing is under pressure.

3. Release pressure slowly by carefully opening the venting screw (1).
4. Open lock at the discharge to let out fluids.

   Simultaneously, open the venting screw (1) to let out fluids.

5. Collect leaking fluids or lead them to a drain.
6. Secure all venting connections and drain connections (e.g. valves and hoses).
7. Dispose of fluids according to the disposal provisions in force ↳ 10.4 “Disposal ”.

10.3 Disassembly

Requirements:

- Filter has been purged ↳ 6.2 “Rinsing”.
- Material supply system of the plant is discharged and secured against reconnection.
- Compressed air supply of the plant is discharged and secured against reconnection.
- Filter is depressurized ↳ 10.2 “Decommissioning”.

Personnel:

- Mechanic
- + additional qualification explosion protection

Protective equipment:

- Eye protection
- Protective gloves
- Anti-Static Safety Boots
- Protective workwear

The position numbers relate to the Fig. 1.

1. Open screw connection on the material outlet (8).
2. Pull out pipeline from filter.
3. Remove sealing ring. Replace sealing ring by a new one if damaged.
4. Open screw connection on the material inlet (7).
5. Pull out pipeline from filter.
6. Remove sealing ring. Replace sealing ring by a new one if damaged.
7. You may have to unscrew pressure relief valve from the material inlet (7).
8. Clean filter ↳ 7 “Cleaning”.

10.4 Disposal

ENVIRONMENT!

Improper waste disposal

Improper waste disposal threatens the environment and prevents re-use and recycling.

- Clean components before their disposal.
- Always dispose of components in accordance with their characteristics. ↳ 11.6 “Materials used”
- Collect leaked out utilities and auxiliaries completely.
- Dispose of work equipment soaked in coating materials or operating substances according to the disposal provisions in force.
- Dispose of utilities and auxiliaries according to the disposal provisions in force.
- In case of doubt, refer to the local disposal authorities.

11 Technical data

11.1 Dimensions and weight

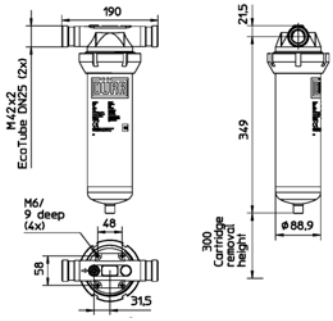

Fig. 5: Dimensions M16090114

Detail	Value
Diameter without screw connections	88.9 mm
Diameter with screw connections	190 mm
Height	370.5 mm
Additional height for filter disassembly	300 mm
Weight	3.6 kg

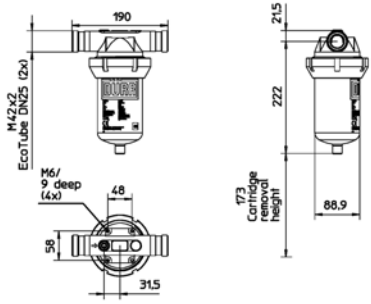

Fig. 6: Dimensions M16090115

Detail	Value
Diameter without screw connections	88.9 mm
Diameter with screw connections	190 mm
Height	243.5 mm
Additional height for filter disassembly	173 mm
Weight	3.2 kg

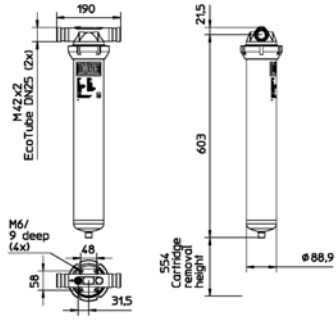

Fig. 7: Dimensions M16090124

Detail	Value
Diameter without screw connections	88.9 mm
Diameter with screw connections	190 mm
Height	624.5 mm
Additional height for filter disassembly	554 mm
Weight	4.6 kg

11.2 Connections

Detail	Value
Material inlet	M42x2
Material outlet	M42x2

11.3 Operating conditions

Detail	Value
Ambient temperature, min.	10 °C
Ambient temperature, max.	50 °C

11.4 Operating values

M16090114	
Detail	**Value**
Operating pressure, max.	28 bar
Volume	2.2 l

M16090115	
Detail	**Value**
Operating pressure, max.	28 bar
Volume	1.5 l

M16090124	
Detail	**Value**
Operating pressure, max.	28 bar
Volume	3.7 l

11.5 Type plate

The type plate is also etched on the filter sump. The type plate shows the following details:

- Product name
- Material number
- Year of manufacture
- Serial number
- Filter volume
- Minimum operating temperature
- Material operating temperature
- Maximum operating pressure
- DGRL Fluid group
- EX labeling
- CE marking
- QR Code
- Manufacturer

11.6 Materials used

Component	Material
Filter lid	316 L (1.4404)
Filter sump	316 L (1.4404)
Internal parts	316 L (1.4404)
Seal	FEP/ Viton
Filter cartridge	Polypropylene

12 Replacement parts and tools

12.1 Replacement parts

The position numbers relate to the 8.3 “Dismantling”.

Item	Denomination	Quantity	Material number
2	O Ring	1	M08030799
4	Guide rod 5" (for M16090115)	1	M12090037
	Guide rod 10" (for M16090114)		M12090038
	Guide rod 20" (for M16090124)		M12090039
5	Filter cartridge 5", 5 µm (for M16090115)	1	M13100220
	Filter cartridge 5", 75 µm (for M16090115)		M13100273
	Filter cartridge 10", 5 µm (for M16090114)		M13100221
	Filter cartridge 251mm, 200µm (for M16090114)		M13100227
	Filter cartridge 251mm, 125µm (for M16090114)		M13100228
	Filter cartridge 251mm, 10µm (for M16090114)		M13100229
	Filter cartridge 10", 30µm (for M16090114)		M13100239
	Filter cartridge 10", 150µm (for M16090114)		M13100240
	Filter cartridge 10", 20µm (for M16090114)		M13100271
	Filter cartridge 10", 75µm (for M16090114)		M13100272
	Filter cartridge 20", 5µm (for M16090124)		M13100222
6	Pressure nut	1	M30050075

12.2 Tools

Description	Material number
C-wrench for filter housing	W12010009

12.3 Order

WARNING!

Unsuitable replacement parts in explosive areas

Replacement parts not compliant with the specifications of the ATEX guidelines can cause explosions in an explosive atmosphere. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

WARNING!

Unsuitable replacement parts

Replacement parts of third-party suppliers may possibly not be able to hold the loads. Serious injury and death could be the consequence.

- Use exclusively original replacement parts.

Ordering replacement parts, tools and accessories as well as information on products that are listed without order number ↳ “Hotline and Contact”.

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Translation of the original operation manual
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