

The Atlas Copco logo is located in the top right corner of the page. It consists of the brand name "Atlas Copco" in a white, italicized serif font, centered between two horizontal white bars. The background of the entire page is a photograph of a warehouse or industrial facility, showing rows of blue metal barrels stacked on high industrial shelving units. In the foreground, a yellow Jungheinrich forklift is visible, with a worker in a high-visibility vest operating it. A large, semi-transparent blue triangle is overlaid on the bottom left of the image, containing technical drawings of a compressor component.

Atlas Copco

# Roto Inject Fluid NDURANCE

Atlas Copco Lubricants

Ultimate mineral oil for your GA/GX compressor

Atlas Copco Roto Inject Fluid NDURANCE is a mineral based oil specially formulated to protect your GA-GX rotary screw compressor.

With several years of experience on developing cutting edge technology on compressors, Atlas Copco has designed a unique additive package that enables the Roto Inject Fluid NDURANCE to work in harmony with all other components in the compressor.

# Roto Inject Fluid NDURANCE

Atlas Copco Lubricants

With extended service intervals of up to 4 000 hours when operating in mild conditions, RIF NDURANCE is a combination of a premium mineral base fluid with an enhanced additive package to allow your compressor to operate in dusty and humid conditions and keeping your system deposit free.

The tailor-made viscosity (55mm<sup>2</sup>/s) together with specially designed anti-wear additives provides your compressor the right lubrication for rotors, bearings and gears for a wide spread of operating conditions.



Features	Benefits	
<b>High resistance against oxidation</b>	Resistance against heavy pollution, high operating temperatures and high humidity.	Protects the compressor against oxidation, leading to a longer drain interval: up to 4 000 h or 1 year in mild ambient conditions.
<b>Perfect sealing and anti-wear properties</b>	Anti-wear additives are developed to protect the rotating parts. This will also help seal the gaps between the rotors when the air is in the compression phase.	Constant oil film protects the rotors and bearings during operation, preventing metal-metal contact of critical parts. Will avoid air leakages in the element.
<b>Protection against corrosion</b>	Roto Inject Fluid NDURANCE separates easily from water, maintaining original lubricant properties.	Ensures that lubricant will keep its original properties after separation from water. It will also keep water out of the oil circuit, avoiding corrosion on the metal parts.
<b>Oil system free of deposits</b>	High oxidation resistance of the base fluid in combination with specially designed antioxidant additives will avoid formation of lacquer or sludge when operating in specified conditions.	Reduces contamination in the oil separator that would lead to pressure drop (meaning inefficient working of the compressor) or blocking of valves. This also reduces the risk of downtime due to oil system cleaning.
<b>Good demulsifying properties</b>	Roto Inject Fluid NDURANCE separates easily from water, protecting the system from emulsions.	Enables the optimum performance of the Atlas Copco OSC & OSD treatment devices.
<b>Low foaming tendency</b>	Good air release properties make sure the air is efficiently separated from the lubricant without foaming.	Increases the efficiency of your compressor. Low foaming will avoid pressure drops in the separator element.
<b>Optimized viscosity</b>	Tuned lubrication that guarantees the correct oil film during operation.	Full protection of the moving parts at a wide spread of operating conditions.
<b>Volatility and oil consumption</b>	Premium mineral base fluid containing less volatile components.	Reduces oil carry over compared to typical mineral compressor oil.

# Lubricant characteristics

Appearance: Clear light brown

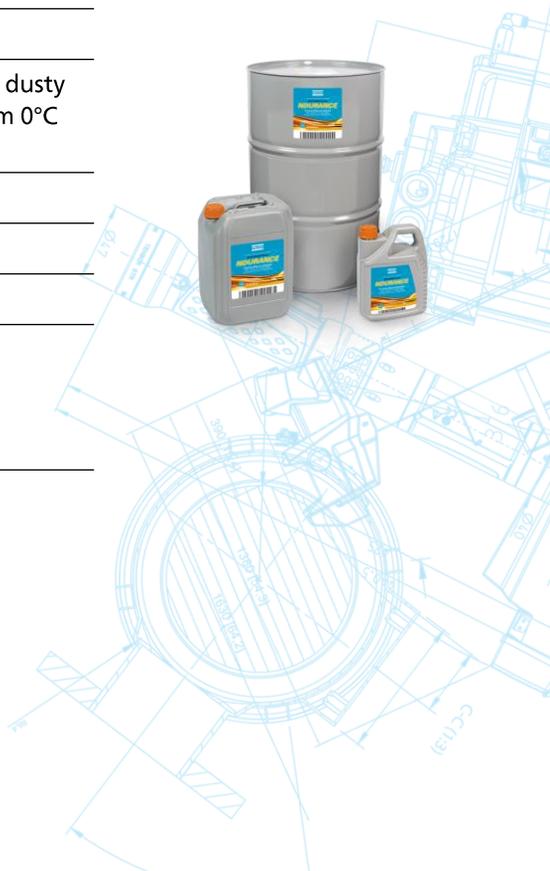
Performance	Method	Unit	Value
Density at 15°C	ISO 3675	kg/dm <sup>3</sup>	0,87
Viscosity at 40°C	ASTM D 445	mm <sup>2</sup> /s	55
Viscosity index	ASTM D 2270		106
Foam stability	ASTM D 892	ml	0/0/0
Total acid number	ASTM D 974	mg KOH/g	0,1
FZG fail stage	ISO 14635-2		11
Rust test	ASTM D 665B		Pass
Pour point	ASTM D 97	°C	-33

These characteristics are typical of current production. Whilst future production will conform to Atlas Copco's specification, variations in these characteristics may occur. Complies with ISO 6743 /3 /1A class L-DAH

## ID Card

### Roto Inject Fluid NDURANCE

Oil type	Mineral based lubricant	
Service intervals	4 000 h or 1 year at mild ambient conditions	
Environment	Ambient temperature range at 0°C to +30°C and dusty environment or ambient temperature range from 0°C to +30°C and humid environment	
	Maximum operating pressure 13 bar	
Equipment	Atlas Copco single stage oil-injected screws	
Compatibility	GA, GX compressors	
Capacity (ID)	5 l plastic can	(1630 1146 00)
	20 l plastic can	(1630 0918 00)
	209 l metal drum	(1630 0919 00)
	1000 l container	(1630 1442 00)



Product name: AEON 3000 OIL / F-2105

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## SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

#### 1.1 Identification of the article

**Product name**

AEON3000OIL / F-2105

**Recommended use**

Compressor oil

**Product code**

743460

#### 1.2 Manufacturer, importer, supplier

##### 1.2.1 Supplier

Gardner Denver Oy

##### 1.2.2 Street address

Etu-Hankkionkatu 9

**Postcode and post office**

33700 Tampere

**Post-office box**

P.O.Box 516

**Postcode and post office**

33101 Tampere, Finland

**Telephone**

+358 (0)205 441 41

**Telefax**

+358 (0)205 441 40

##### 1.2.3 Name and address of the informant in emergency cases

HYKS, Poison Information Center, Stenbäckinkatu 11, FIN-00290 Helsinki

**Emergency telephone number**

+358-9-471 977 or +358-9-4711, HYKS Poison information center (24h)

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

#### 2.1 Chemical characterisation

Mineral oil-based, solvent-refined paraffinic hydrocarbons and additives mixture.

#### 2.2 Hazardous components

2.2.1 CAS-No.	2.2.2 Chemical name of the substance	2.2.3 Weight %	2.2.4 Classification
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*	Mineral oil	> 90 %(m/m)	HTP, see section 8.2.
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### 3. HAZARDS IDENTIFICATION

**HUMAN HEALTH HAZARDS:** No specific hazards under normal use conditions. Contains mineral oil for which an exposure limit for oil mist applies. Prolonged or repeated exposure may give rise to dermatitis. Used oil may contain harmful impurities.

**DANGERS OF FIRE AND EXPLOSION:** Not classified as flammable but will burn.

**ENVIRONMENTAL HAZARDS:** Risk of soil and water pollution. Not readily biodegradable. Has the potential to bioaccumulate.

See also sections 5, 11 and 12.

# Gardner Denver

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## 4. FIRST AID MEASURES

### 4.1 General advice

-

### 4.2 Inhalation

If the person exposed to oil mist or vapour suffers from unusual fatigue or nausea, get him or her into fresh air. If the symptoms continue, see a doctor.

### 4.3 Skin contact

Remove contaminated clothing and wash affected skin with soap and water. If high pressure injection injuries occur, obtain medical attention immediately. If persistent irritation occurs, obtain medical attention.

### 4.4 Eye contact

Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

### 4.5 Ingestion

Wash out mouth with water and obtain medical attention. DO NOT INDUCE VOMITING. If the patient is not nauseous, s/he may be given 1-2 tablespoons of cream.

### 4.6 Notes to physician

Treat symptomatically. Aspiration into the lungs may cause chemical pneumonitis. See section 11.5 concerning the effects on health.

## 5. FIRE-FIGHTING MEASURES

### 5.1 Suitable extinguishing media

Foam and dry chemical powder. Carbon dioxide, sand or earth may be used for small fires only.

### 5.2 Extinguishing media which must not be used for safety reasons

Do not use water in a jet. Use of Halon extinguishers should be avoided for environmental reasons.

### 5.3 Specific hazards

-

### 5.4 Special protective equipment for firefighters

Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

### 5.5 Specific methods

-

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions

Evacuate the area of all non-essential personnel.

See Treatment section 7.1.

See Personnel protection equipment section 8.3.

### 6.2 Environmental precautions

Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform local authorities if this cannot be prevented. Shut off leaks, if possible without personal risk.

### 6.3 Methods for cleaning up

Leaks are absorbed into sand, soil or other suitable absorbent material. Sweep up and remove to a suitable, clearly marked container for disposal. Dispose in compliance with the instructions of local authorities. See Section 13 for information on disposal.

### 6.4 Specific methods

-

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## 7. HANDLING AND STORAGE

### 7.1 Handling

When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages.

### 7.2 Storage

Keep in a cool, dry, well-ventilated place. Use properly labelled and closable containers. Avoid direct sunlight, heat sources, and strong oxidising agents.

Storage temperature: 0 °C minimum

Storage temperature: 50 °C maximum

For containers, use: mild steel, high density polyethylene

For containers or container linings, avoid: PVC

Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Engineering measures

The product should be handled in closed systems when possible or adequate ventilation must be arranged. Avoid repeated or extended contact with the skin and inhaling oil mist. Use personal protection equipment when necessary.

### 8.2 National occupational exposure limits

#### 8.2.1 National occupational exposure limits

<b>Chemical name of the substance</b>	Oil mist
	5 mg/m <sup>3</sup> (8 h)

### 8.3 Personal protective equipment

#### 8.3.1 Hygiene measures

Wash hands before eating, drinking, smoking and using the toilet.

#### 8.3.2 Respiratory protection

Not normally required. Respiratory protection equipment with a combination A2/P2 filter (organic gases and solvent fumes/organic dust) must be used when necessary.

#### 8.3.3 Hand protection

PVC or nitrile rubber gloves

#### 8.3.4 Eye protection

Wear safety glasses or full face shield if splashes are likely to occur.

#### 8.3.5 Skin and body protection

Minimise all forms of skin contact. Wear overalls to minimise contamination of personal clothing. Launder overalls and undergarments regularly.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1	<b>Form, Colour, Odour</b>	brown, oily liquid
9.2	<b>PH</b>	-
9.3	<b>Information on changes in the physical state</b>	
9.3.1	<b>Boiling point/range</b>	>280 °C
9.3.2	<b>Melting point/range</b>	-
9.3.3	<b>Decomposition temperature</b>	-
9.4	<b>Flash point</b>	220 °C (ASTM D 92)
9.5	<b>Flammability (solid, gas)</b>	-
9.6	<b>Autoignition temperature</b>	>320 °C

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<b>9.7</b>	<b>Explosive properties</b>	-
<b>9.8</b>	<b>Explosion limits</b>	
	- lower	1 %(V/V)
	- upper	10 %(V/V)
<b>9.9</b>	<b>Oxidising properties</b>	-
<b>9.10</b>	<b>Vapour pressure</b>	< 0.5 Pa (20 °C)
<b>9.11</b>	<b>Relative density</b>	885 kg/m <sup>3</sup> (15 °C)
<b>9.12</b>	<b>Solubility</b>	
	- water solubility	Insoluble
	- fat solubility	-
<b>9.13</b>	<b>Partition coefficient (n-octanol/water)</b>	
	log P <sub>ow</sub> > 6 (estimate)	
<b>9.14</b>	<b>Viscosity</b>	41.4 - 50.6 mm <sup>2</sup> /s (40 °C)
<b>9.15</b>	<b>Further information</b>	
	Pour point -30 °C	
	Calcium < 0,3 % (m/m)	
	Zinc < 0,2 % (m/m)	
	Magnesium < 0,1 % (m/m)	

## 10. STABILITY AND REACTIVITY

- 10.1** Conditions to avoid  
-
- 10.2** Materials to avoid  
-
- 10.3** Hazardous decomposition products  
-

## 11. TOXICOLOGICAL INFORMATION

- 11.1** Acute toxicity  
Toxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the toxicology of similar products.
- Dermally: LD<sub>50</sub> > 2000 mg/kg  
Orally: LD<sub>50</sub> > 2000 mg/kg  
Inhalation: Data not available.
- 11.2** Primary irritation  
Eyes: Expected to be slightly irritant.  
Skin: Expected to be slightly irritant.  
Respiratory tract: If mists are inhaled, slight irritation of the respiratory tract may occur.
- 11.3** Sensitisation  
Not a skin sensitiser.
- 11.4** Long term toxicity  
Not mutagenic. Product is based on mineral oils of types shown to be non-carcinogenic in animal skin-painting studies.
- 11.5** Human experience  
Prolonged and/or repeated contact with products containing mineral oils can result in defatting of the skin, particularly at elevated temperatures. This can lead to irritation and possibly dermatitis, especially under conditions of poor personal hygiene.

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## 11.6 Further information

Used engine oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

## 12. ECOLOGICAL INFORMATION

### 12.1 Persistence and degradability

#### 12.1.1 Biological degradability

Not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

#### 12.1.2 Chemical degradation

-

### 12.2 Bioaccumulation

Has the potential to bioaccumulate.

### 12.3 Mobility

Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

### 12.4 Ecotoxicity effects

#### 12.4.1 Aquatic toxicity

Poorly soluble mixture. Practically non-toxic, LC/EC50 > 100 mg/l, to aquatic organisms (estimated). May cause physical fouling of aquatic organisms.

#### 12.4.2 Toxicity to other organisms

Data not available.

### 12.5 Further information

Ecotoxicological data have not been determined specifically for this product. Information given is based on data on the components and the ecotoxicology of similar products.

## 13. DISPOSAL CONSIDERATIONS

Waste containing the product is hazardous and must be disposed of in accordance with legislation on waste and in compliance with the instructions of environmental authorities. Note that the waste is hazardous when handling it and ensure the appropriate cautionary action is taken and that warnings are posted and proper notice is given.

## 14. TRANSPORT INFORMATION

14.1	UN-No	-
14.2	Packaging group	-
14.3	Land transport	
14.3.1	Class	-
14.3.2	Risk code	-
14.3.3	Description of the goods	-
14.3.4	Further Information	-
14.4	Sea transport	
14.4.1	Class	-
14.4.2	Proper shipping name	-
14.4.3	Further Information	-
14.5	Air transport	
14.5.1	ICAO	-
14.5.2	Proper shipping name	-
14.5.3	Further Information	-

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## 15. REGULATORY INFORMATION

### 15.1 Labelling

#### 15.1.1 Symbol(s)

-

## 16. OTHER INFORMATION

### 16.1 Recommended use

#### 16.1.1 Expressed in writing

Compressor oil

#### 16.1.2 Code for the purpose of use

TO D

KT: 23 .

L:

### 16.2 Instructions for use

-

### 16.3 Further information

The information in this document should be made available to all who may handle the product. This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

### 16.4 Additional information available from

Gardner Denver Oy, After Sales

### 16.5 Literary reference

# AEON<sup>®</sup> Synthetic Lubricants

AEON<sup>®</sup> PD, AEON<sup>®</sup> PD-FG, AEON<sup>®</sup> PD-XD



**GD**  
**GARDNER DENVER**

Experience Proven Results™

# AEON® Synthetic Lubricants



## *AEON PD-XD is now available!*

- AEON PD-XD has the highest viscosity offered by Gardner Denver for Extreme Duty applications
- Designed specifically for high ambient and high discharge temperature conditions

## More Economical than Mineral Oil

- Longer service life
- Fewer oil changes and less replacement oil
- Less down time = higher productivity
- Reduced maintenance personnel and material costs
- Reduced oil disposal costs
- Better for the environment

## Application

- Positive Displacement blowers & vacuum pumps
- AEON PD Synthetic Lubricants provide maximum protection for demanding operating conditions in any environment or application

## Description

- AEON PD Synthetic Lubricants are custom blended, synthetic hydrocarbon (polyalphaolefin) based oils
- AEON PD products are free of toxic materials or heavy metals per OSHA and EPA guidelines
- AEON PD is compatible with the majority of seal materials: teflon, viton, nitrile buna N, fluorocarbon, polysulfide, polyacrylic and fluorosilicone
- AEON PD-FG Food Grade complies with FDA 21 CFR 178.3570 requirements for lubricants with the possibility of incidental food contact
- AEON PD-FG is NSF approved

## Usage & Performance

- Superior performance in a variety of application and temperatures
- Factory recommended for Gardner Denver Sutorbilt®, DuroFlow®, CycloBlower®, HeliFlow® and TriFlow® PD blowers and vacuum pumps
- Formulated for minimal blower wear and maximum equipment life
- Optimized viscosity provides superior lubrication in severe hot and cold temperatures with minimal energy consumption

## Benefits of AEON PD VS. MINERAL OIL

### Longer Service Life & Improved Performance

- AEON PD typically lasts up to 4 times longer than mineral oils operating under the same conditions
  - Severe operating conditions may warrant more frequent oil changes
  - Laboratory analysis of the oil should be used to help determine the optimum oil change interval
- AEON PD Lubricants have a higher viscosity index
- AEON PD lubricates equipment more effectively and better maintains viscosity at high temperatures
- No need for seasonal oil changes (refer to Operating & Maintenance manuals for specific information)
- Mineral Oils have poor low temperature properties, resulting in increased wear during start-up, ultimately shortening equipment life
- Mineral oils have increased water content reducing bearing life exponentially

### Advanced Chemistry

- AEON PD superior oil/water separation and corrosion inhibitors protect bearings and extend blower life significantly
- Rust and oxidation inhibitors, and anti-foam additives provides improved performance



## AEON® PD Blower Lubrication Chart

		Ambient Temperatures				
		Less than 10° F	10° F to 32° F	32° F to 60° F	60° F to 90° F	Greater than 90° F
Blower Discharge Temperatures	Less than 32° F	AEON PD AEON PD-FG	AEON PD AEON PD-FG			
	32° F to 100° F	AEON PD AEON PD-FG	AEON PD AEON PD-FG	AEON PD AEON PD-FG AEON PD-XD	AEON PD AEON PD-FG AEON PD-XD	
	100° F to 200° F	AEON PD AEON PD-FG	AEON PD AEON PD-FG	AEON PD AEON PD-FG AEON PD-XD	AEON PD AEON PD-FG AEON PD-XD	AEON PD AEON PD-FG AEON PD-XD
	200° F to 300° F	AEON PD AEON PD-FG	AEON PD AEON PD-FG	AEON PD AEON PD-FG AEON PD-XD	AEON PD-XD	AEON PD-XD
	Greater than 300° F		AEON PD AEON PD-FG	AEON PD-XD	AEON PD-XD	AEON PD-XD

Recommended AEON PD lubricant based on operating conditions.

## Technical Data

Properties	AEON PD	AEON PD-FG	AEON PD-XD	
Viscosity	at 40°C cSt	214	217	365.7
	at 100°C cSt	22.2	24	39.32
	at 100°F SUS	1115	1130	1911.5
	at 210°F SUS	110.7	120	190.4
Pour Point °F/°C	-38/-39	-46/-43	-44/-42	
Flash Point °F/°C	450/232	535/279	515/268	

## Order Information

NOW AVAILABLE in convenient gallon size containers

Convenient Package Sizes	AEON PD Part No.	AEON PD-FG Part No.	AEON PD-XD Part No.
1 quart	28G23	28H97	28G46
Case 12 quarts	28G24	28H98	28G47
1 gallon	28G40	28H333	28G42
Case 6 gallons	28G41	28H334	28G43
5 gallon pail	28G25	28H99	28G44
55 gallon drum	28G28	28H100	28G45

Reference blower operating manual for specific lubrication requirements.

*Protect your investment:*  
Insist on genuine Gardner Denver AEON® PD Lubricants

### Cost Savings of AEON PD vs. MINERAL OIL

- Sutorbilt 1024-8000 blower with an oil capacity of 13 quarts
- Based on an operating time of 6000 hours for one blower

#### OVER \$195 SAVINGS PER BLOWER

*Savings may vary based on your specific conditions.*

	AEON PD	MINERAL OIL
Cost of initial fill (13 quarts)	\$148.79	\$52.40
Lube change interval	6000 hours	1500 hours
Cost of replacement lubricant	\$0	\$157.20
Labor (\$45/change)	\$0	\$135.00
<b>TOTAL COST</b>	<b>\$148.79</b>	<b>\$344.60</b>

# Gardner Denver®

www.GardnerDenverProducts.com pd.blowers@gardnerdenver.com

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Telephone: (800) 682-9868 FAX: (217) 221-8780

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 Please recycle after use.



# AEON™

## Screw Compressor Lubricants

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Protect Your Investment!

**GD**  
GARDNER DENVER

Experience Proven Results™

# AEON™ Lubricants ...

## simply the best protection of your investment



It is a known fact that a compressor's lubricant is its life-blood, its basic source of strength and vitality. So why jeopardize the efficiencies and longevity of your compressor with just any "oil"?

Gardner Denver, a name synonymous with quality, performance and dependability, offers one of the best in compressor lubrication technology – AEON™ lubricants.

AEON™ lubricants are specially formulated to combat the harsh elements of compression while maximising efficiencies and equipment longevity.

**AEON™ lubricants ... designed for maximum reliability in air compressor equipment.**

A network of factory trained Gardner Denver distributors is ready to assist you with AEON™ lubricants for all your compressor needs — and with Genuine Parts for your Gardner Denver compressors.

- **Factory**
- **Factory Tested**
- **Factory Approved**



## AEON™ 3000

### Hydrocarbon Lubricant and Coolant

Formulated from a blend of highly purified hydrocarbon base stocks and special additives for maximum operating and service life. Performs much like a full synthetic in an economical, semisynthetic, petroleum blend. A superior alternative to automotive lubricants, industrial hydraulic and turbine oils. Non-toxic, non hazardous and can be mixed in any amount with mineral oils for ease of disposal.

#### Your advantages on a view

- Outstanding demulsibility vs. automotive lubricants for fast, efficient condensate separation.
- Formulated to provide superior internal component protection over a wide temperature range.
- Excellent oxidative stability to ensure maximum service life at elevated temperatures.
- Unique additive package designed specifically for screw compressors maximises efficiency while minimising oil carry over.
- Minimises harmful varnish and sludge forming tendencies common to alternative mineral oil products.

Service life depends on model and type. Please refer to user manual.



## AEON™ 6000 FG

### Food Grade, Extended Life Synthetic Lubricant

#### Your advantages on a view

- Tested and certified by NSF International. Registered in category H1 lubricants with incidental contact. Registration number 138935.
  - Minimises maintenance and downtime.
  - Improved lubrication at high and low temperatures.
- Service life depends on model and type. Please refer to user manual.



## AEON™ 9000 SP

### Synthetic Lubricant and Coolant

It's a PAO (polyalphaolefin)/MFSE (multifunctional synthetic ester) synthetic blend tested and proven to provide optimum operating and service-life results. A highly robust blend formulated to withstand high temperatures, varnish/sludge formation, and environmental contamination. A unique additive package designed specifically to maximise compressor efficiency and provide optimum lubricity. A proven track record of superior service-life in the most rugged operating environments.

#### Your advantages on a view

- Superior thin-film protection for compressor internal components.
  - Superior oxidation stability vs. other competitive brands.
  - Completely demulsible – separates quickly, reduces condensate disposal costs.
  - Minimises oil carryover, reduces “make-up” costs.
  - High flash point improves your safety margin.
  - Non-hazardous, disposable with mineral-based compressor lubricants.
- Service life depends on model and type. Please refer to user manual.

## Selected Physical Properties

Properties	AEON™ 3000 Test Method/Results	AEON™ 6000 FG Test Method/Results	AEON™ 9000 SP Test Method/Results
Viscosity, cSt	ASTM D445	ASTM D445	ASTM D445
at 40 °C	46.0	46.9	49.01
at 100 °C	6.8	7.9	7.83
ISO Grade	46	46	46
Pour point °C	ASTM D97... -33	ASTM D97 ... -60	ASTM D97 ... -54
Flash point °C	ASTM D92... 230	ASTM D92 ... 246	ASTM D92 ... 260
Fire point °C		ASTM D92 ... 273	ASTM D92 ... 293
Demulsibility	ASTM D1401 – at 54°C 20 min	ASTM D1401 40/40/0 (<1 min)	ASTM D1401 – 40/40/0 (<1 min)
Colour	clear pale yellow	clear	lilac
Package size	Part #	Part #	Part #
Bottle	03389144 (3 x 5 l)	–	–
Pail	03389142 (20 l)	89795109 (19 l)	89756089 (19 l)
Drum	03389143 (209 l)	89795239 (208 l)	89767689 (208 l)
HMIS Hazard ID	Health 1	Health 1	Health 1
	Reactivity 0	Reactivity 0	Reactivity 0
	Flammability 1	Flammability 1	Flammability 1

# Gardner Denver ...

## The Answer

You get total product support now and for years to come from our dedicated international team of professional distributors.

- Great Compressor Warranties
- Dedicated, Authorized, Factory-Trained – Compressor Distributors
- Genuine Compressor Replacement Parts
- 24-Hour Compressor Service Support

## Original Gardner Denver spares are a smart choice!

Our spare parts are specially designed, factory tested, and field proven for use in Gardner Denver rotary screw compressors. We guarantee that our spare parts will perfectly fit your Gardner Denver compressor.

Non-original parts may increase both oil consumption and power costs due to higher pressure drops over air filters and oil separators.

By using original spare parts, you save money! Our durable and reliable spares ensure that you maintain maximum output from your compressor with minimum energy costs.

Gardner Denver spare parts are made for 24 hours daily operation.

Using only original Gardner Denver spares will ensure trouble free operation for your compressor, and ensure you comply with warranty obligations.



For additional information please contact Gardner Denver or your local representative.

# GD

**GARDNER DENVER**

info.tampere@gardnerdenver.com  
www.gardnerdenverproducts.com

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# OXYGEN FILTERS

Guaranteed safe and reliable filtration.



# Oxygen Generation & The Need For Specialist Filtration



Oxygen is one of the basic and abundant chemical elements, making up 21% of the earth's atmosphere, and is vital for most life forms on earth. At standard pressure and temperature, oxygen is a colourless, odourless, and tasteless gas with the molecular formula O<sub>2</sub>.

Over one hundred million tonnes of O<sub>2</sub> is extracted from the air every year for use in medical and industrial applications; Oxygen is an essential medicine required at all levels of the health care system for resuscitation, surgery and for various therapies. Only high quality medical grade oxygen should be given to patients, and international standards for the production of medical oxygen should be followed for patient protection.

## On-site Oxygen Generation

Oxygen generators offer a cost-effective, reliable, and safe method of producing gaseous oxygen from compressed air on-site. There are several different methods used to produce oxygen on-site and, whether this is through Pressure Swing Absorption (PSA), Vacuum Swing Absorption (VSA), Cryogenic Distillation, or any other method, it is vital that purity standards are met.

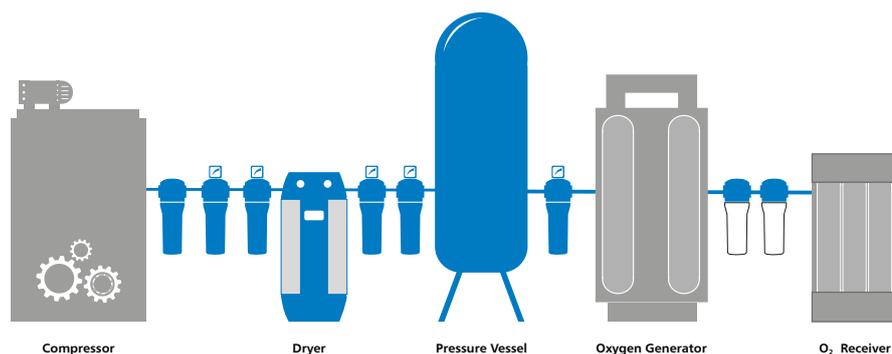
## The Importance of Specialist Filtration in Oxygen Generation

High quality filtration for oxygen gas generation is essential, not only to ensure the delivery of reliable compressed air and gas in line with the purity standards required for your end application, but also to protect the integrity and safety of your gas generation systems. Walker Filtration can offer the right compressed air and gas treatment solution with coalescing, particulate, and medical sterile filters, providing high quality inlet air prior to entering an oxygen generator, as well as the required filtration after the generation process.

## Hazards & Risks of Concentrated Oxygen

Oxygen enrichment of the atmosphere, even by a few percent, considerably increases the risk of combustion. Because oxygen enriched air is highly reactive, it is imperative all apparatus used in the manufacture, distribution and utilisation of oxygen complies with applicable regulations, and does not contain or introduce materials that could be combustible when in contact with the gas. This includes the filtration used within an oxygen generation system. Walker Filtration's Oxygen Filters are manufactured using a state of the art environmentally clean controlled area. This ensures no contamination can be introduced into the oxygen application.

Walker Filtration provides complete peace of mind with a reliable filtration solution, cleaned in accordance with ASTM G93/ G93M.



The above schematic represents a typical oxygen generation flow path including oxygen service/non-oxygen service filter installations, pre and post oxygen generator. Please contact Walker Filtration Sales Department to discuss your specific requirements and for guidance on recommended grades of filtration to achieve optimised air/gas purity.

# Medical Oxygen



Medical oxygen is recognised as an essential medicine in the field of healthcare and has been used medically for over 100 years. It is crucial to treatments for critically ill patients, especially those with respiratory symptoms and low levels of oxygen in the bloodstream.

When generating medical oxygen onsite in Europe, it is necessary to comply with the specifications given in the European Pharmacopoeia monographs for "Oxygen 93 Percent". Oxygen 93 Percent is a medicinal gas produced from compressed air, containing no less than 90% percent, and no more than 96% percent of O<sub>2</sub>.

Worldwide demand for medical oxygen has seen a significant and ongoing increase in recent years, with the prevalence of respiratory illnesses and diseases, and viruses that cause respiratory symptoms becoming more and more common. Because of this, the requirement to provide a reliable and limitless supply of oxygen on-site that can adjust according to requirements has also seen an increase in demand.

## Medical Sterile Grade Filtration

It is essential that standards to produce medical oxygen are followed and quality components, including filtration, are used in the generation process.

**When it comes to patient care, quality and reliability are paramount.**

Walker Filtration Medical Sterile Oxygen Filters meet the required cleanliness, material and filtration standards for medical oxygen, providing safe filtration to ensure that gas purity standards are met.

**Delivering clean air and oxygen where it matters most.**

Our Medical Sterile Filters are designed to exceed the requirements of HTM 02-01 medical gas pipeline systems and are cleaned for oxygen service in accordance with ASTM G93/G93M.



# Industrial Oxygen



Oxygen generation is essential to many industrial applications where it is necessary to have consistent, dependable, secure supplies of high-purity oxygen. In most industrial applications, the level of oxygen purity required is above 95%. Industrial applications include but are not limited to:

## Metallurgy

Modern steelmaking relies heavily on the use of oxygen to enrich air and increase combustion temperatures in furnaces, as well as to replace coke with other combustible materials. Used with fuel gases in gas welding and gas cutting, oxygen must be of high quality to ensure a high cutting speed and a clean cut. Large quantities of oxygen are also used to make other metals, such as copper, lead, and zinc.

## Food & Beverage

The concentration of ambient air into oxygen and ozone is key to the environmental and sustainable production in the food & beverage industry, including sanitisation of process equipment, food storage, and water bottling. Walker Filtration Alpha Series Oxygen Filters are produced from high quality, non-toxic, naturally inert raw materials and constituents, in accordance with FDA requirements for food contact as per Code of Federal Regulation (CFR), Title 21.

## Aquaculture

High purity oxygen is crucial to modern day fish farming. Correctly dosed pure oxygen is essential to livestock yields, growth potential and their overall health.

## Glass and Ceramics Production

Oxygen is used instead of air to optimise combustion and elevate flame temperatures in glass melting tanks. This results in better control of heating patterns, lower fuel consumption, and reduction in particulate and NOx emissions.

## Semiconductors

Oxygen is used for the oxidation of silicon, one of the most critical processes in all of semiconductor manufacturing.

## Pulp & Paper

In the manufacture of high-quality bleached pulp, oxygen is used in the bleaching process. New processes using oxygen, rather than chlorine, reduce water pollution and lowers costs.

## Wastewater Treatment

In industrial and municipal wastewater treatment plants, oxygen is injected during the treatment process. Also known as the activated sludge process, pumping oxygen into the wastewater tank encourages the growth of bacteria and speeds up the bio-degradation process which breaks down organic matter.



# The Solution

Walker Filtration's Oxygen Filters are cleaned for oxygen service in accordance with ASTM G93/G93M, delivering reliable filtration in line with the purity standards required for your end application.

Walker Filtration's Alpha Oxygen Filters are designed specifically for use in the oxygen generation process. They offer reliable and energy efficient filtration in accordance with the ASTM G93/G93M Standard Guide for Cleanliness Levels and Cleaning Methods for Materials and Equipment Used in Oxygen-Enriched Environments.

Providing high quality air pre and post oxygen generator, our oxygen filters are available in both Coalescing and Particulate (dust) filtration grades from 25 – 0.01 micron, as well as Medical Sterile.

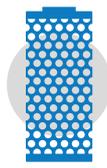
They combine market leading Alpha filtration technology to ensure energy efficiency and superior filtration performance, with a specialised manufacturing process and strict cleaning methods to guarantee they do not contain or introduce materials that could be combustible when in contact with concentrated oxygen.

With flexible pipe sizes and flow rates to suit specific customer requirements, whatever your oxygen generator setup – we have a filtration solution for you.



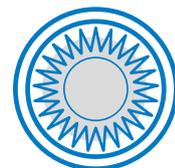
## Flow-Optimised Design

- Improved air flow characteristics
- Reduced energy consumption
- Reduced cost of ownership



## Increased Performance

- Significantly reduced differential pressure <math>< 125 \text{ mbar}</math>
- Up to 20.7 barg (300 psig) maximum working pressure
- Exceptional oil aerosol and particulate removal



## Filtration Technology

- Deep pleated media
- Housing design for flexible installation and simplified serviceability

# Alpha Oxygen Range - Features & Benefits

Available in 1/8" to 3" threaded Rp (BSP Parallel), Rc (BSP Taper) or NPT port sizes, with flow rates of 6 – 1500 scfm (10 – 2550 Nm<sup>3</sup>/hr), Walker Filtration Oxygen Filters are suitable for worldwide installation. With a maximum temperature of 120°C (248°F) and a maximum operating pressure of up to 20.7 barg (300 psig).

Tested and validated in accordance with ISO 12500-1 & ISO 8573-1: 2010, Walker Filtration Oxygen filter housings and elements are manufactured using only the highest quality materials that have been specifically chosen to ensure they do not contain or introduce materials that could be combustible when in contact with oxygen gas and deliver the optimum filtration performance.



## Product Safety In Mind

Single-start thread and fixed thread engagement stop guarantees safe housing closure and prevents over tightening. Lock indication arrows ensure effective sealing.

## Robust Design and EP Corrosion Protection

Featuring a durable and hard wearing electrophoretic coating on both internal and external faces, followed by a tough polyester powder coating, Alpha range filters offer corrosion resistance and have been salt spray tested to ISO 9227:2012.

## Simplified Serviceability

Designed with servicing and maintenance in mind, the new profiled bowl design and hexagonal spanner locator coupled with the internal unique push fit element ensures a simple, quick and reliable servicing process.





**Modular Filter**

Low cost connecting kits and new filter head design enables easy close coupling assembly and minimises space requirements.

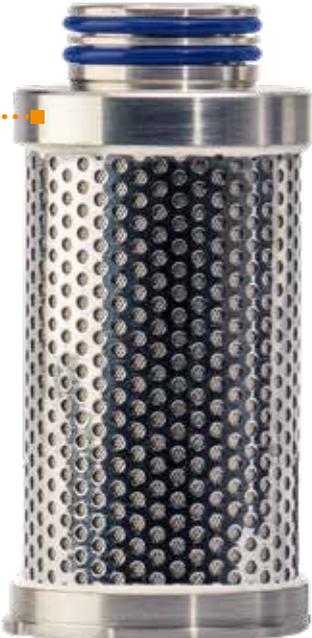
**Market Leading Performance**

With four coalescing and particulate filtration grades available: 25 micron, 5, micron, 1 micron, and 0.01 micron, Alpha elements are energy efficient and provide class leading performance . An advanced filter design, combined with deep pleated custom engineered filtration media on general purpose and high efficiency grades, and a unique anti re-entrainment layer for exceptional oil coalescence, significantly reduces differential pressure ensuring low total cost of ownership.

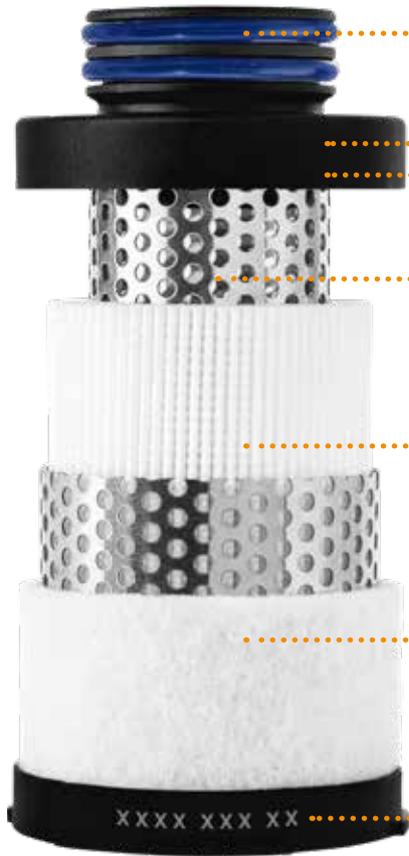


**Medical Sterile Grade Filtration**

Designed to exceed the requirements of HTM 02-01 medical gas pipeline systems, the Walker Filtration Oxygen range also includes Medical Sterile 0.01 micron filters. Manufactured from cast aluminium alloy for enhanced strength and protection, Medical Sterile elements are guaranteed for a minimum of 100 sterilisations at 120°C (248°F) - ensuring your oxygen pipeline is free from bacteria and other sub-micron particles.



# Features & Benefits



■ **Blue Viton O-rings**, for easy identification of Oxygen Filter Elements that are suitable for use in oxygen enriched air flow

■ **Push Fit** Walker Filtration Elements ensure perfect sealing within the filter housing and assist with easy removal

■ **Corrosion resistant end caps** injection moulded from glass filled nylon for added durability

■ **High quality stainless steel** cylinders provide corrosion resistance and deliver strength and stability to the element

■ **Custom engineered Hydrophobic & Oleophobic Borosilicate media** specifically developed to deliver consistently low pressure drop, Pleated element construction for high dirt holding capacity and an increased surface area is used on general purpose and high efficiency filtration grades

■ **Custom outer drainage layer** prevents oil carryover and improves coalescence performance

■ **Full traceability and easy identification** Laser etched marking enables easy grade and part number identification, branding, and batch code traceability in line with our ISO9001 manufacturing process.

## Performance Assured

Walker Filtration is known for creating high quality, well-engineered, filtration solutions that offer market leading performance for an international marketplace. Alpha Series filter housings are approved to international standards and are available in a complete range of contaminant removal grades designed to meet the compressed air and gas purity requirements throughout industry.

### Filter Housing Design

- ✓ 1000 hour neutral salt spray test for corrosion to ISO 9227: 2006
- ✓ Burst pressure tested in excess of 100 barg for a 5:1 safety factor
- ✓ Housings are pressure decay tested before despatch. Fine filters are 100% aerosol integrity tested

### Element Technology

- ✓ **ISO 8573-1: 2010** – Compressed air purity standard
- ✓ **ISO 12500 Series** – International standard for compressed air filter testing

### Independent Validation

- ✓ **Pressure Equipment Directive – 2014/68/EU**  
Lloyd's Register EMEA – Notified Body No. 0038 71 Fenchurch Street, London, EC3M 4BS
- ✓ **ISO 9001 Quality Systems – LRQ0930553**  
Lloyd's Register Deutschland GmbH, Überseeallee 10, 20457 Hamburg, Germany - Notified Body No 0525.
- ✓ **CRN Approved – CRN0E22360** – For use within Canada

# Make It Yours: Custom Branded Products to Fit Your Portfolio

For over 35 years the Walker Filtration team has specialised in OEM solutions.

We understand the importance of reinforcing and enhancing a customer's brand, and ensuring that aftermarket sales are effectively captured.



## Branding Solutions

We can customise filters so they seamlessly integrate into your gas generation systems, ensuring brand consistency and helping to capture aftermarket sales.

Every OEM solution developed by our team is unique. We take care of brand management, bespoke packaging, language support, unique part numbers, logistical details, and are dedicated to reducing the amount of time it takes to get your product to market.

## Expert Technical And Transitional Support

Our fully trained sales and technical teams have extensive knowledge and experience in helping our customers launch new products and transition product vendors. They will work with you to create unique part numbers, provide technical and sales training, marketing support, and so much more.

We also offer an extensive aftermarket element portfolio to ensure you can still service any current filtration products you have in the field.

## Walker Filtration Product Ranges

Walker Filtration offer a comprehensive range of compressed air filtration and drying products:



Water Separators



Dryers



Medical Vacuum



Duplex Filters



Flanged Filters



Alternative Elements



Medical Sterile

For our full product range and further information please visit: [www.walkerfiltration.com](http://www.walkerfiltration.com) or contact your nearest Walker Filtration sales department.

# Coalescing and Particulate Filters

## Technical Specification

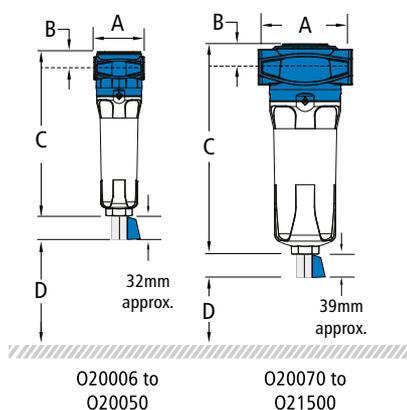
Coalescing and Particulate Filter Model	Pipe size inches	Inlet flow rate*		Dimensions mm				Weight Kg	Element model
		Nm <sup>3</sup> /hr	SCFM	A	B	C	D		
O20006 (grade)	1/8	9.5	5.7	50	17	157	60	0.3	EO20306 (grade)
O20015 (grade)	1/4	23.8	14.3	50	17	157	60	0.3	EO20306 (grade)
O20025 (grade)	1/4	39.9	23.8	70	23	231	70	0.6	EO20408 (grade)
O20032 (grade)	3/8	51.3	30.4	70	23	231	70	0.6	EO20408 (grade)
O20050 (grade)	1/2	80.8	47.5	70	23	231	70	0.6	EO20412 (grade)
O20070 (grade)	1/2	113.1	66.5	127	32	285	80	1.7	EO20612 (grade)
O20085 (grade)	3/4	136.8	80.8	127	32	285	80	1.7	EO20612 (grade)
O20105 (grade)	1	169.1	99.8	127	32	285	80	1.7	EO20612 (grade)
O20125 (grade)	3/4	201.4	118.8	127	32	370	80	2.0	EO20621 (grade)
O20175 (grade)	1	282.2	166.3	127	32	370	80	2.0	EO20621 (grade)
O20280 (grade)	1 1/4	452.2	266.0	140	41	476	85	3.0	EO20731 (grade)
O20320 (grade)	1 1/2	516.8	304.0	140	41	476	85	3.0	EO20731 (grade)
O20400 (grade)	1 1/2	646.0	380.0	170	53	508	100	4.9	EO20831 (grade)
O20450 (grade)	2	726.8	427.5	170	53	508	100	4.9	EO20831 (grade)
O20700 (grade)	2	1129.6	665.0	170	53	708	100	5.5	EO20850 (grade)
O20850 (grade)	2 1/2	1371.8	807.5	220	70	736	100	10.5	EO21140 (grade)
O20900 (grade)	3	1452.6	855.0	220	70	736	100	10.5	EO21140 (grade)
O21250 (grade)	3	2018.8	1187.5	220	70	857	100	11.5	EO21160 (grade)
O21500 (grade)	3	2422.5	1425.0	220	70	1005	100	12.5	EO21175 (grade)

\* Rated flow at 7 barg, reference conditions 1 bar (a) 20°C, calculated using 0.95 Gas Density Factor based on 93% oxygen saturation

Grade	X25 / RX25		X5 / RX5		X1 / RX1		XA / RXA	
Particle removal	25 micron		5 micron		1 micron		0.01 micron	
Max particle size class**	-		4		3		1	
Max oil content**	-		4		3		1	
Max oil carryover at 20°C (68°F)	10 mg/m <sup>3</sup>		5 mg/m <sup>3</sup>		0.3 mg/m <sup>3</sup>		0.01 mg/m <sup>3</sup>	
Pressure loss - clean & dry	30 mbar	0.4 psi	40 mbar	0.6 psi	55 mbar	0.8 psi	85 mbar	1.2 psi
Pressure loss - saturated	50 mbar	0.7 psi	75 mbar	1.1 psi	125 mbar	1.8 psi	125 mbar	1.8 psi
Pressure loss - element change	12 mths	8000 hrs	12 mths	8000 hrs	12 mths	8000 hrs	12 mths	8000 hrs
Max temperature	120°C	248°F	120°C	248°F	120°C	248°F	120°C	248°F
Max working pressure	20.7 barg	300 psig	20.7 barg	300 psig	20.7 barg	300 psig	20.7 barg	300 psig
Max autoclave temperature	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Element end cap colour	Black							

\*\* to ISO 8573-1: 2010

Pressure correction factors	for maximum flow rate, multiply model flow rate by the correction factor corresponding to the minimum operating pressure									
Operating pressure barg (psig)	4 (58)	5 (72)	6 (87)	7 (100)	8 (115)	10 (145)	12 (174)	14 (203)	16 (232)	20.7 (300)
7 barg - correction factor	0.76	0.84	0.92	1.00	1.07	1.19	1.31	1.41	1.51	1.73



### Technical Notes

- Direction of flow is inside to out through the filter element for coalescing grades (X25, X5, X1 and XA), and outside to in for particulate grades (RX25, RX5, RX1 and RXA)
- All Oxygen Filters are fitted as standard with Manual Drain Valves, VMDV25 on models O20006 to O20050, VMDVE25B on models O20070 to O20700, and VMDVE25M on models O20850 to O21500. Standard filters can operate at 20.7 barg (300 psig) range at 120°C (248°F).
- Alpha Oxygen Filters are manufactured from cast aluminium alloy and are PED 2014/68/EU compliant for group 1 and group 2 gases.
- Threaded connections are Rp (BSP Parallel) to ISO 7-1 or NPT to ANSI/ASME B1.20.1 if supplied within North America. Rc (BSP Taper) to ISO 7-1 also available.
- Filters are suitable for use with mineral and synthetic oils plus oil-free compressed air applications.
- Filter elements should be changed every 12 months / 8000 hours (whichever comes first).
- Walker Filtration genuine spare and aftermarket parts must be used, failure to do so will void product warranty. Walker Filtration shall not be held liable for damages suffered by the customer if Walker Filtration genuine oxygen rated spare and aftermarket parts are not used.
- All Walker Filtration Alpha Oxygen Filters are produced from high quality, non-toxic, naturally inert raw materials and constituents, in accordance with FDA requirements for food contact as per Code of Federal Regulation (CFR), Title 21.
- Other filtration grades are available. Please contact sales for specific requests.

# Medical Sterile Filters

## Technical Specification

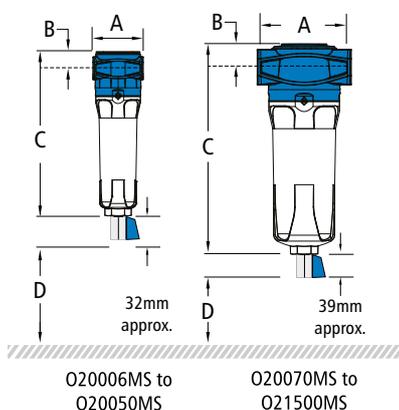
Filter Model	Pipe size inches	Inlet flow rate*		Dimensions mm				Weight Kg	Element model
		Nm <sup>3</sup> /hr	SCFM	A	B	C	D		
O20006MS	1/8	9.5	5.7	50	17	157	60	0.3	EO20306SR
O20015MS	1/4	23.8	14.3	50	17	157	60	0.3	EO20306SR
O20025MS	1/4	39.9	23.8	70	23	231	70	0.6	EO20408SR
O20032MS	3/8	51.3	30.4	70	23	231	70	0.6	EO20408SR
O20050MS	1/2	80.8	47.5	70	23	231	70	0.6	EO20412SR
O20070MS	1/2	113.1	66.5	127	32	285	80	1.7	EO20612SR
O20085MS	3/4	136.8	80.8	127	32	285	80	1.7	EO20612SR
O20105MS	1	169.1	99.8	127	32	285	80	1.7	EO20612SR
O20125MS	3/4	201.4	118.8	127	32	370	80	2.0	EO20621SR
O20175MS	1	282.2	166.3	127	32	370	80	2.0	EO20621SR
O20280MS	1 1/4	452.2	266.0	140	41	476	85	3.0	EO20731SR
O20320MS	1 1/2	516.8	304.0	140	41	476	85	3.0	EO20731SR
O20400MS	1 1/2	646.0	380.0	170	53	508	100	4.9	EO20831SR
O20450MS	2	726.8	427.5	170	53	508	100	4.9	EO20831SR
O20700MS	2	1129.6	665.0	170	53	708	100	5.5	EO20850SR
O20850MS	2 1/2	1371.8	807.5	220	70	736	100	10.5	EO21140SR
O20900MS	3	1452.6	855.0	220	70	736	100	10.5	EO21140SR
O21250MS	3	2018.8	1187.5	220	70	857	100	11.5	EO21160SR
O21500MS	3	2422.5	1425.0	220	70	1005	100	12.5	EO21175SR

\* Rated flow at 7 barg, reference conditions 1 bar (a) 20°C, calculated using 0.95 Gas Density Factor based on 93% oxygen saturation

Grade	SR	
DOP efficiency**	>99.9999%	
Particle removal	0.01 micron	
Maximum operating temperature	120°C	248°F
Recommended operating temperature	50°C	122°F
Maximum autoclave temperature	134°C	273°F
Pressure Loss - clean & dry	100 mbar	1.5 psi
Maximum working pressure	20.7 barg	300 psig
Element end cap material	Stainless steel	

\*\* As specified in HTM 02-01 medical gas pipeline systems

Pressure correction factors	for maximum flow rate, multiply model flow rate by the correction factor corresponding to the minimum operating pressure									
Operating pressure barg (psig)	4 (58)	5 (72)	6 (87)	7 (100)	8 (115)	10 (145)	12 (174)	14 (203)	16 (232)	20.7 (300)
7 barg - correction factor	0.76	0.84	0.92	1.00	1.07	1.19	1.31	1.41	1.51	1.73



### Technical Notes

- Direction of air flow is inside to out through the filter element. Filter element end caps are stainless steel.
- All Oxygen Filters are fitted as standard with Manual Drain Valves, VMDV25 on models O20006 to O20050, VMDVE25B on models O20070 to O20700, and VMDVE25M on models O20850 to O21500. Standard filters can operate at 20.7 barg (300 psig) range at 120°C (248°F).
- Alpha Oxygen Filters are manufactured from cast aluminium alloy and are PED 2014/68/EU compliant for group 1 and group 2 gases.
- Threaded connections are Rp (BSP Parallel) to ISO 7-1 or NPT to ANSI/ASME B1.20.1 if supplied within North America. Rc (BSP Taper) to ISO 7-1 also available.
- Pre-filtration should be used in conjunction with 0.01 micron sterile filters.
- Medical Sterile Filter elements must not operate in water or oil saturated conditions and should be changed at least every 6 months.
- Maximum steam sterilising autoclave temperature refers to the filter element ONLY. Oxygen grade SR filter elements can be steam sterilised 100 times. Each element must be autoclaved before commencement of duty.
- Each element is supplied with an Air Sterilisation Certificate to guarantee the highest quality to our customers.
- Oxygen SR grade filters are suitable for use in dry air conditions only, as any liquids passing through the filter could carry bacteria and compromise sterility.
- Walker Filtration genuine spare and aftermarket parts must be used, failure to do so will void product warranty. Walker Filtration genuine oxygen rated spare and aftermarket parts are not used.
- All Walker Filtration Alpha Oxygen Filters are produced from high quality, non-toxic, naturally inert raw materials and constituents, in accordance with FDA requirements for food contact as per Code of Federal Regulation (CFR), Title 21.



# **W** WALKER FILTRATION

The ultimate filtration & drying technology

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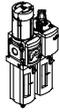
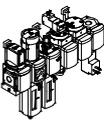
Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series



# Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series

FESTO

Product range overview – MS series service units

Type	Size	Pneumatic connection in housing	Connecting plate	Pressure regulation range [bar]						Grade of filtration [µm]			
				0.05 ... 0.7	0.05 ... 2.5	0.1 ... 4	0.3 ... 7	0.1 ... 12	0.5 ... 16	0.01	1	5	40
Code			AG.../AQ...	D2	D4	D5	D6	D7	D8	A	B	C	E
<b>Service unit combinations</b>													
<b>MSB-FRC</b> 	4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	■	■	-	-	-	■	■
	6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	■	■	-	-	-	■	■
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-
<b>Service unit combinations (further variants can be ordered using the configurator → Internet: msb4, msb6 or msb9)</b>													
<b>MSB</b> 	4	G1/4	G1/8, G1/4, G3/8	-	-	-	■	■	-	-	-	■	■
	6	G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	■	■	-	-	-	■	■
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-
<b>Individual devices</b>													
Filter regulators <b>MS-LFR</b> 	4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	■	■	■	-	-	-	■	■
	6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	■	■	■	■	-	-	■	■
	9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	■	■	■	■	-	-	■	■
	12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	■	■	■	-	-	■	■
Filters <b>MS-LF</b> 	4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	-	-	-	■	■
	6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	-	-	■	■
	9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	-	-	-	-	-	-	■	■
	12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	-	-	■	■
Fine and micro filters <b>MS-LFM</b> 	4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	■	■	-	-	-
	6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	■	■	-	-	-
	9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	-	-	-	■	■	-	-	-
	12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	■	■	-	-	-
Activated carbon filters <b>MS-LFX</b> 	4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	-	-	-	-	-
	6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	-	-	-	-
	9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	-	-	-	-	-	-	-	-
	12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	-	-	-	-
Water separators <b>MS-LWS</b> 	4	-	-	-	-	-	-	-	-	-	-	-	-
	6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	-	-	-	-
	9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	-	-	-	-	-	-	-	-
	12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	-	-	-	-

# Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series



Product range overview – MS series service units

Type	Size	Bowl guard		Condensate drains				Pressure indicator				Security		Options		→ Page/ Internet	
		Plastic bowl with plastic bowl guard	Metal bowl	Manual rotary	Semi-automatic	Fully automatic	External, fully automatic, electrical	Cover plate (without pressure gauge)	Integrated MS pressure gauge	Adapter plate for EN pressure gauge G1/8	Adapter plate for EN pressure gauge G1/4	Pressure sensor	Rotary knob with detent, lockable via accessories	Rotary knob with integrated lock	Silencer		Flow direction from right to left
Code		R	U	M	H	V	E...	VS	AG	A8	A4	AD...	AS	E11	S	Z	
<b>Service unit combinations</b>																	
MSB-FRC	4	■	-	■	-	■	-	-	■	-	-	-	■	-	-	■	msb4
	6	■	■	■	-	■	-	-	■	-	-	-	■	-	-	■	msb6
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Service unit combinations</b>																	
MSB	4	■	■	■	-	■	-	-	■	-	-	-	■	-	-	■	msb4
	6	■	■	■	-	■	-	-	■	-	-	-	■	-	-	■	msb6
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Individual devices</b>																	
Filter regulators MS-LFR	4	■	■	■	■	■	-	■	■	■	■	■	■	■	-	■	ms4-lfr
	6	■	■	■	■	■	■	■	■	■	■	■	■	■	-	■	ms6-lfr
	9	-	■	■	■	■	■	■	■	■	■	■	■	■	-	■	ms9-lfr
	12	-	■	■	-	■	■	■	■	■	■	■	■	■	-	■	ms12-lfr
Filters MS-LF	4	■	■	■	■	■	-	-	-	-	-	-	-	-	-	■	ms4-lf
	6	■	■	■	■	■	■	-	-	-	-	-	-	-	-	■	ms6-lf
	9	-	■	■	■	■	■	-	-	-	-	-	-	-	-	■	ms9-lf
	12	-	■	■	-	■	■	-	-	-	-	-	-	-	-	■	ms12-lf
Fine and micro filters MS-LFM	4	■	■	■	■	■	-	-	-	-	-	-	-	-	-	■	ms4-lfm
	6	■	■	■	■	■	■	-	-	-	-	-	-	-	-	■	ms6-lfm
	9	-	■	■	■	■	■	-	-	-	-	-	-	-	-	■	ms9-lfm
	12	-	■	■	-	■	■	-	-	-	-	-	-	-	-	■	ms12-lfm
Activated carbon filters MS-LFX	4	■	■	-	-	-	-	-	-	-	-	-	-	-	-	■	ms4-lfx
	6	■	■	-	-	-	-	-	-	-	-	-	-	-	-	■	ms6-lfx
	9	-	■	-	-	-	-	-	-	-	-	-	-	-	-	■	ms9-lfx
	12	-	■	-	-	-	-	-	-	-	-	-	-	-	-	■	ms12-lfx
Water separators MS-LWS	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	■	-	-	■	■	-	-	-	-	-	-	-	-	■	ms6-lws
	9	-	■	-	-	■	■	-	-	-	-	-	-	-	-	■	ms9-lws
	12	-	■	-	-	■	■	-	-	-	-	-	-	-	-	■	ms12-lws

# Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series



Product range overview – MS series service units

Type	Size	Pneumatic connection in housing	Connecting plate	Pressure regulation range [bar]						Supply voltage			
				0.05 ... 0.7	0.05 ... 2.5	0.1 ... 4	0.3 ... 7	0.1 ... 12	0.5 ... 16	24 V DC, connection pattern to EN 175301	24 V DC, connection M12 to IEC 61076-2-101	110 V AC, connection pattern to EN 175301	230 V AC, connection pattern to EN 175301
Code			AG.../AQ...	D2	D4	D5	D6	D7	D8	V24	V24P	V110	V230
<b>Individual devices</b>													
Pressure regulators <b>MS-LR</b>		4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	■	■	■	-	-	-	-
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	■	■	■	■	-	-	-
		9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	■	■	■	■	-	-	-
		12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	■	■	■	-	-	-
Pressure regulators <b>MS-LRB</b>		4	G1/4	G1/8, G1/4, G3/8	-	-	■	■	■	-	-	-	-
		6	G1/2	G1/4, G3/8, G1/2, G3/4	-	-	■	■	■	■	-	-	-
		9	-	-	-	-	-	-	-	-	-	-	-
		12	-	-	-	-	-	-	-	-	-	-	-
Precision pressure regulators <b>MS-LRP</b>		4	-	-	-	-	-	-	-	-	-	-	-
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	■	■	■	-	■	-	-	-	-
		9	-	-	-	-	-	-	-	-	-	-	-
		12	-	-	-	-	-	-	-	-	-	-	-
Precision pressure regulators <b>MS-LRPB</b>		4	-	-	-	-	-	-	-	-	-	-	-
		6	G1/2	G1/4, G3/8, G1/2, G3/4	■	■	■	-	■	-	-	-	-
		9	-	-	-	-	-	-	-	-	-	-	-
		12	-	-	-	-	-	-	-	-	-	-	-
Electrical pressure regulators <b>MS-LRE</b>		4	-	-	-	-	-	-	-	-	-	-	-
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	■	■	■	■	-	-	-
		9	-	-	-	-	-	-	-	-	-	-	-
		12	-	-	-	-	-	-	-	-	-	-	-
Lubricators <b>MS-LOE</b>		4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	-	-	-	-
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	-	-	-
		9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	-	-	-	-	-	-	-
		12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	-	-	-
On-off valves, manually actuated <b>MS-EM(1)</b>		4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	-	-	-	-
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	-	-	-
		9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	-	-	-	-	-	-	-
		12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	-	-	-
On-off valves, electrically actuated <b>MS-EE</b>		4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	-	■	-	■
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	■	-	■
		9	G3/4, G1	G1/2, G3/4, G1, G1 1/4, G1 1/2	-	-	-	-	-	-	■	■	■
		12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	■	■	■
Soft-start valves, pneumatically actuated <b>MS-DL</b>		4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	-	-	-	-
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	-	-	-
		9	-	-	-	-	-	-	-	-	-	-	-
		12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	-	-	-
Soft-start valves, electrically actuated <b>MS-DE</b>		4	G1/8, G1/4	G1/8, G1/4, G3/8	-	-	-	-	-	-	■	-	■
		6	G1/4, G3/8, G1/2	G1/4, G3/8, G1/2, G3/4	-	-	-	-	-	-	■	-	■
		9	-	-	-	-	-	-	-	-	-	-	-
		12	-	G1, G1 1/4, G1 1/2, G2	-	-	-	-	-	-	■	■	■

# Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series

Product range overview – MS series service units

Type	Size	Bowl guard		Pressure indicator				Security			Options		→ Page/ Internet
		Plastic bowl with plastic bowl guard	Metal bowl	Cover plate (without pressure gauge)	Integrated MS pressure gauge	Adapter plate for EN pressure gauge G1/8	Adapter plate for EN pressure gauge G1/4	Pressure sensor	Rotary knob with detent, lockable via accessories	Rotary knob with integrated lock	Silencer	Flow direction from right to left	
Code		R	U	VS	AG	A8	A4	AD...	AS	E11	S	Z	
<b>Individual devices</b>													
Pressure regulators <b>MS-LR</b>	4	-	-	■	■	■	■	■	■	■	-	■	8
	6	-	-	■	■	-	■	■	■	■	-	■	8
	9	-	-	■	■	-	■	■	■	■	-	■	74
	12	-	-	■	■	-	■	-	■	■	-	■	86
Pressure regulators <b>MS-LRB</b>	4	-	-	■	■	■	■	■	■	■	-	■	22
	6	-	-	■	■	-	■	■	■	■	-	■	22
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-
Precision pressure regulators <b>MS-LRP</b>	4	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	■	-	■	■	■	■	■	-	■	36
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-
Precision pressure regulators <b>MS-LRPB</b>	4	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	■	-	■	■	■	■	■	-	■	50
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-
Electrical pressure regulators <b>MS-LRE</b>	4	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	■	■	-	■	-	-	-	-	■	66
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-
Lubricators <b>MS-LOE</b>	4	■	■	-	-	-	-	-	-	-	-	■	ms4-loe
	6	■	■	-	-	-	-	-	-	-	-	■	ms6-loe
	9	-	■	-	-	-	-	-	-	-	-	■	ms9-loe
	12	-	■	-	-	-	-	-	-	-	-	■	ms12-loe
On-off valves, manually actuated <b>MS-EM(1)</b>	4	-	-	■	■	■	■	■	-	-	■	■	ms4-em1
	6	-	-	■	■	-	■	■	-	-	■	■	ms6-em1
	9	-	-	■	■	-	■	-	-	-	■	■	ms9-em
	12	-	-	■	■	-	■	-	-	-	■	■	ms12-em
On-off valves, electrically actuated <b>MS-EE</b>	4	-	-	■	■	■	■	■	-	-	■	■	ms4-ee
	6	-	-	■	■	-	■	■	-	-	■	■	ms6-ee
	9	-	-	■	■	-	■	■	-	-	■	■	ms9-ee
	12	-	-	■	■	-	■	-	-	-	■	■	ms12-ee
Soft-start valves, pneumatically actuated <b>MS-DL</b>	4	-	-	■	■	■	■	■	-	-	-	■	ms4-dl
	6	-	-	■	■	-	■	■	-	-	-	■	ms6-dl
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	■	■	-	■	-	-	-	-	■	ms12-dl
Soft-start valves, electrically actuated <b>MS-DE</b>	4	-	-	■	■	■	■	■	-	-	-	■	ms4-de
	6	-	-	■	■	-	■	■	-	-	-	■	ms6-de
	9	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	■	■	-	■	-	-	-	-	■	ms12-de

# Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series



Product range overview – MS series service units

Type	Size	Pneumatic connection in housing	Connecting plate	Performance Level			Supply voltage				
				Category 1, 1-channel	Category 3, 2-channel	Category 4, 2-channel with self-monitoring	24 V DC, connection pattern to EN 175301	24 V DC, connection M12 to IEC 61076-2-101/ to EN 60947-5-2	110 V AC, connection pattern to EN 175301	230 V AC, connection pattern to EN 175301	
Code			AG.../AQ...	C	D	E	V24	V24P	V110	V230	
<b>Individual devices</b>											
Soft start and exhaust valves <b>MS-SV-C</b>		4	–								
		6	G $\frac{1}{2}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ , G $\frac{3}{4}$	■	–	–	■	■	■	■
		9	G $\frac{3}{4}$ , G1	G $\frac{1}{2}$ , G $\frac{3}{4}$ , G1, G1 $\frac{1}{4}$ , G1 $\frac{1}{2}$	■	–	–	■	■	■	■
		12	–								
Soft start and exhaust valves <b>MS-SV-D</b>		4	–								
		6	G $\frac{1}{2}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ , G $\frac{3}{4}$	–	■	–	■	■	–	–
		9	–								
		12	–								
Soft start and exhaust valves <b>MS-SV-E</b>		4	–								
		6	G $\frac{1}{2}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ , G $\frac{3}{4}$	–	–	■	■	–	–	–
		9	–								
		12	–								
Membrane air dryers <b>MS-LDM1</b>		4	G $\frac{1}{8}$ , G $\frac{1}{4}$	G $\frac{1}{8}$ , G $\frac{1}{4}$ , G $\frac{3}{8}$	–	–	–	–	–	–	–
		6	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ , G $\frac{3}{4}$	–	–	–	–	–	–	–
		9	–								
		12	–								
Branching modules <b>MS-FRM</b>		4	G $\frac{1}{8}$ , G $\frac{1}{4}$	G $\frac{1}{8}$ , G $\frac{1}{4}$ , G $\frac{3}{8}$	–	–	–	–	–	–	–
		6	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ , G $\frac{3}{4}$	–	–	–	–	–	–	–
		9	G $\frac{3}{4}$ , G1	G $\frac{1}{2}$ , G $\frac{3}{4}$ , G1, G1 $\frac{1}{4}$ , G1 $\frac{1}{2}$	–	–	–	–	–	–	–
		12	–	G1, G1 $\frac{1}{4}$ , G1 $\frac{1}{2}$ , G2	–	–	–	–	–	–	–
Distributor blocks <b>MS-FRM-FRZ</b>		4	G $\frac{1}{4}$	–	–	–	–	–	–	–	
		6	G $\frac{1}{2}$	–	–	–	–	–	–	–	
		9	–								
		12	–								
Flow sensors <b>SFAM</b>		4	–								
		6	G $\frac{1}{2}$	G $\frac{1}{2}$	–	–	–	–	–	–	
		9	–	G1, G1 $\frac{1}{2}$	–	–	–	–	–	–	
		12	–								

# Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series

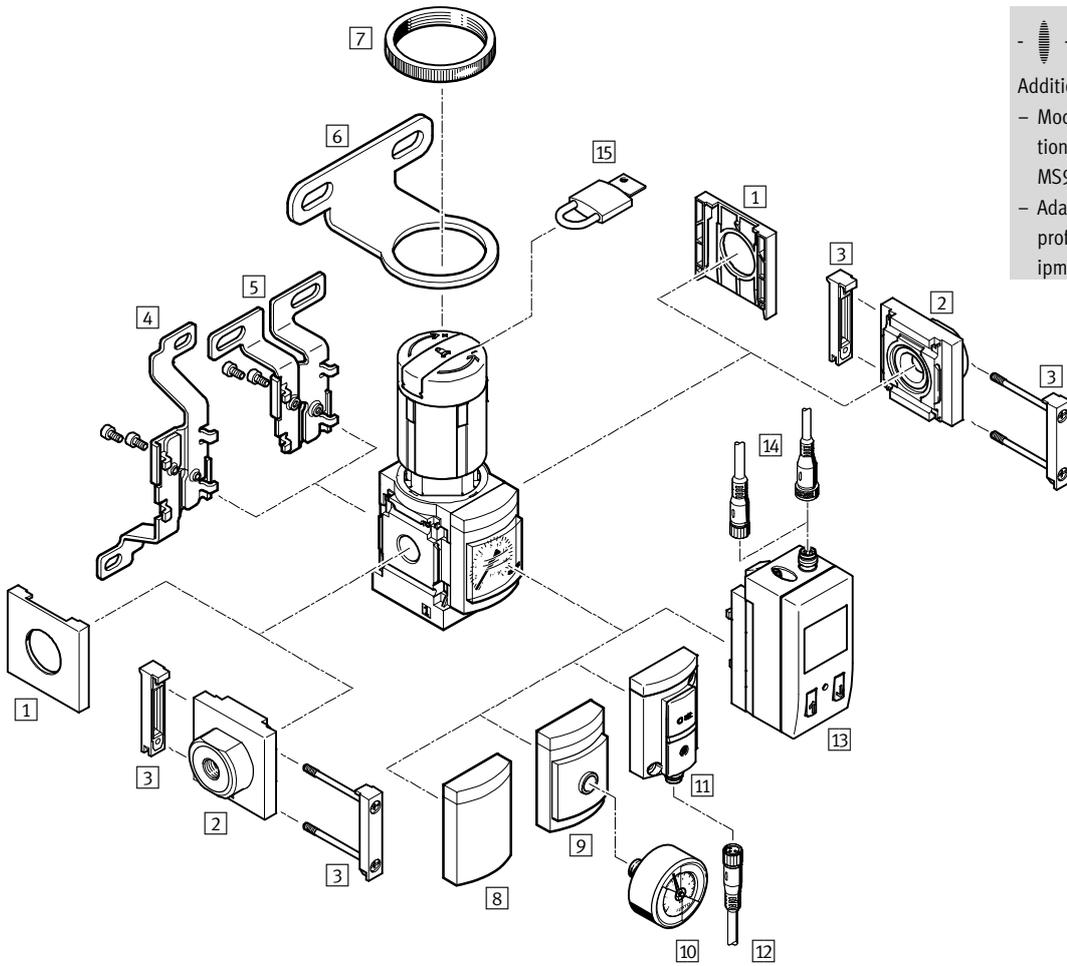
Product range overview – MS series service units

Type	Size	Bowl guard		Pressure indicator					Switch output			Options		→ Page/ Internet
		Plastic bowl with plastic bowl guard	Metal bowl	Cover plate (without pressure gauge)	Integrated MS pressure gauge	Adapter plate for EN pressure gauge G1/8	Adapter plate for EN pressure gauge G1/4	Pressure sensor	2x PNP or NPN, 1 analogue output 4 ... 20 mA	2x PNP or NPN, 1 analogue output 0 ... 10 V	Silencer	Flow direction from right to left		
Code		R	U	VS	AG	A8	A4	AD...	2SA	2SV	S	Z/R		
<b>Individual devices</b>														
Soft start and exhaust valves <b>MS-SV-C</b>	4	-											-	
	6	-	-	■	■	-	■	■	-	-	■	■	ms6-sv	
	9	-	-	■	■	-	■	■	-	-	■	■	ms9-sv	
	12	-											-	
Soft start and exhaust valves <b>MS-SV-D</b>	4	-											-	
	6	-	-	■	■	-	■	■	-	-	■	■	ms6-sv	
	9	-											-	
	12	-											-	
Soft start and exhaust valves <b>MS-SV-E</b>	4	-											-	
	6	-	-	■	■	-	■	■	-	-	■	■	ms6-sv	
	9	-											-	
	12	-											-	
Membrane air dryers <b>MS-LDM1</b>	4	-	■	-	-	-	-	-	-	-	-	■	ms4-ldm1	
	6	-	■	-	-	-	-	-	-	-	-	■	ms6-ldm1	
	9	-											-	
	12	-											-	
Branching modules <b>MS-FRM</b>	4	-	-	■	■	■	■	■	-	-	-	■	ms4-frm	
	6	-	-	■	■	-	■	■	-	-	-	■	ms6-frm	
	9	-	-	■	■	-	■	■	-	-	-	■	ms9-frm	
	12	-	-	■	-	-	-	-	-	-	-	-	ms12-frm	
Distributor blocks <b>MS-FRM-FRZ</b>	4	-	-	-	-	-	-	-	-	-	-	■	ms4-frm	
	6	-	-	-	-	-	-	-	-	-	-	■	ms6-frm	
	9	-											-	
	12	-											-	
Flow sensors <b>SFAM</b>	4	-											-	
	6	-	-	-	-	-	-	-	■	■	-	■	sfam-62	
	9	-	-	-	-	-	-	-	■	■	-	■	sfam-90	
	12	-											-	

# Pressure regulators MS4/MS6-LR, MS series

Peripherals overview

## Pressure regulator MS4/MS6-LR



-  - Note

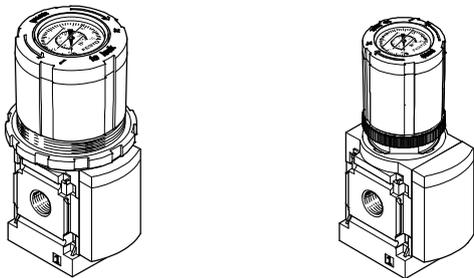
Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 → Internet: amv, rmv, armv
- Adapter plate for mounting on profiles → Internet: ipm-80, ipm-40-80, ipm-80-80

## Pressure regulator with rotary knob pressure gauge

MS4-LR-...-DM2

MS4-LR-...-DM1/MS6-LR-...-DM2



# Pressure regulators MS4/MS6-LR, MS series

Peripherals overview

Mounting attachments and accessories						
		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS4/6-END	■	-	■	-	ms4-end, ms6-end
2	Connecting plate-SET MS4/6-AG...	-	■	-	■	ms4-ag, ms6-ag
	Connecting plate-SET MS4/6-AQ...	-	■	-	■	ms4-aq, ms6-aq
3	Module connector MS4/6-MV	-	■	■	■	ms4-mv, ms6-mv
4	Mounting bracket MS4/6-WB	■	■	-	-	ms4-wb, ms6-wb
5	Mounting bracket MS4-WBM	■	■	-	-	ms4-wbm
6	Mounting bracket MS4/6-WR	■	■	-	-	ms4-wr, ms6-wr
7	Knurled nut (included in scope of delivery) MS-LR	■	■	-	-	-
8	Cover plate VS	■	■	■	■	20
9	Adapter plate for EN pressure gauge 1/8/1/4 A8/A4	■	■	■	■	20
10	Pressure gauge MA	■	■	■	■	95
11	Pressure sensor without display AD7 ... AD10	■	■	■	■	20
12	Connecting cable NEBU-M8...-LE3	■	■	■	■	95
13	Pressure sensor with display AD1 ... AD4	■	■	■	■	20
14	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■	■	■	■	95
15	Padlock LRVS-D	■	■	■	■	95
-	Mounting bracket MS4/6-WP/WPB/WPE/WPM	-	■	■	■	ms4-wp, ms6-wp

# Pressure regulators MS4/MS6-LR, MS series

Type codes

MS 6 - LR - 1/2 - D5 - AS

Series	
MS	Standard service unit

Size	
4	Grid dimension 40 mm
6	Grid dimension 62 mm

Service function	
LR	Pressure regulator

Connection size	
MS4	
1/8	Thread G1/8
1/4	Thread G1/4
MS6	
1/4	Thread G1/4
3/8	Thread G3/8
1/2	Thread G1/2

Pressure regulation range	
D5	0.3 ... 4 bar
D6	0.3 ... 7 bar
D7	0.5 ... 12 bar

Security	
AS	Standard rotary knob with detent, lockable via accessories

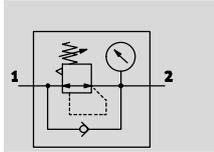
## Additional variants can be ordered using the modular system → 20

- Connecting plates
- Pressure regulation range
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Secondary venting
- Rotary knob alternative
- Alternative mounting position
- Security
- Type of mounting
- EU certification
- UL certification
- Flow direction

# Pressure regulators MS4/MS6-LR, MS series

Technical data

With pressure gauge



- - Flow rate  
1,000 ... 7,500 l/min
- - Temperature range  
-10 ... +60 °C
- - Operating pressure  
0.8 ... 20 bar
- - [www.festo.com](http://www.festo.com)

Wearing parts kits  
→ 19



The pressure regulator maintains a constant working pressure (secondary side), regardless of the pressure variations in the system (primary side) and the air consumption.

- Good regulation characteristics with low hysteresis and primary pressure compensation
- High flow rate with minimal pressure drop
- Available with and without secondary venting
- Regulator lock for protecting the values against adjustment
- Four pressure regulation ranges: 0.3 ... 4 bar, 0.3 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Two pressure gauge connections for different fitting options
- Return flow option for exhausting from output 2 to output 1 already integrated
- Optional pressure sensor
- Optional rotary knob pressure gauge
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		
Size	MS4	MS6
Pneumatic connection 1, 2		
Female thread	G $\frac{1}{8}$ or G $\frac{1}{4}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ or G $\frac{1}{2}$
Connecting plate AG...	G $\frac{1}{8}$ , G $\frac{1}{4}$ or G $\frac{3}{8}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ or G $\frac{3}{4}$
Connecting plate AQ...	NPT $\frac{1}{8}$ , NPT $\frac{1}{4}$ or NPT $\frac{3}{8}$	NPT $\frac{1}{4}$ , NPT $\frac{3}{8}$ , NPT $\frac{1}{2}$ or NPT $\frac{3}{4}$
Constructional design	Directly-actuated diaphragm regulator	
Regulating function	Output pressure constant, with primary pressure compensation, with return flow action, with/without secondary venting	
Type of mounting	Via accessories In-line installation Front panel mounting	
Mounting position	Any	
Regulator lock	Rotary knob with detent Rotary knob with detent, lockable via accessories Rotary knob with integrated lock	
Pressure regulation range/operation	D5 [bar] 0.3 ... 4, manually operated <sup>1)</sup>	
	D6 [bar] 0.3 ... 7, manually operated <sup>1)</sup>	
	D7 [bar] 0.5 ... 12, manually operated (0.5 ... 10 with pressure sensor AD... or with UL certification) <sup>1)</sup>	
	D8 [bar] –	0.5 ... 16, manually operated (0.5 ... 10 with UL certification)
Max. hysteresis [bar]	0.25 (0.4 with rotary knob pressure gauge DM1/DM2)	0.25 (0.4 with rotary knob pressure gauge DM2)
Pressure display	Via pressure sensor for displaying output pressure via LCD display and electrical output Via pressure sensor for displaying output pressure via operational status indicator and electrical output Via pressure gauge for displaying output pressure Via pressure gauge with red/green scale for displaying output pressure Via pressure gauge in rotary knob for displaying output pressure	
	G $\frac{1}{8}$ prepared	–
	G $\frac{1}{4}$ prepared	

1) MS4: For pressure regulators with rotary knob pressure gauge DM..., the pressure regulation range begins at 0.8 bar.

- - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS4/MS6-LR, MS series

FESTO

Technical data

Standard nominal flow rate $q_{nN}^{1)}$ [l/min]						
Size		MS4		MS6		
Pneumatic connection		G $\frac{1}{8}$	G $\frac{1}{4}$	G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$
Pressure regulation range	D5	1,200 <sup>2)</sup>	2,100 <sup>2)</sup>	2,400 <sup>2)</sup>	5,500 <sup>2)</sup>	7,500 <sup>2)</sup>
	D6	1,150	1,800	3,000	5,800	6,500
	D7	1,000	1,700 <sup>3)</sup>	2,700	4,500	5,500
	D8	–	–	2,200	4,000	4,500

1) Measured at  $p_1 = 10$  bar and  $p_2 = 6$  bar,  $\Delta p = 1$  bar

2) Measured at  $p_1 = 10$  bar and  $p_2 = 3$  bar,  $\Delta p = 1$  bar

3) In the case of the DM1/DM2 pressure regulator/gauge with rotary knob,  $q_{nN}$  is equal to 800 litres per minute and  $q_{n \max}$  amounts to 2,200 litres per minute.

Operating and environmental conditions		
Size	MS4	MS6
Operating pressure [bar]	0.8 ... 14 (0.8 ... 10) <sup>1)</sup>	
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
	Inert gases	
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)	
Ambient temperature [°C]	–10 ... +60 (0 ... +50) <sup>2)</sup>	
Temperature of medium [°C]	–10 ... +60 (0 ... +50) <sup>2)</sup>	
Storage temperature [°C]	–10 ... +60	
Corrosion resistance class CRC <sup>3)</sup>	2	
UL certification	cULus recognized (OL)	

1) Value in brackets applies to MS4/MS6-LR with UL certification.

2) Value in brackets applies to MS4/MS6-LR with pressure sensor AD...

3) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	c T6 X
ATEX category dust	II 2D
EX-ignition protection type dust	c 60 °C X
ATEX ambient temperature	–10 °C ≤ Ta ≤ +60 °C
CE mark (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

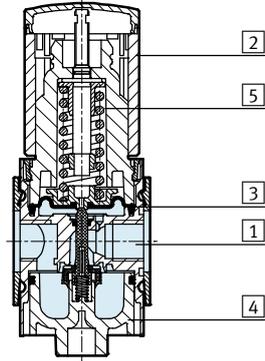
Weight [g]		
Size	MS4	MS6
Pressure regulator	225	730
Pressure regulator with rotary knob with integrated lock E11	350	1,000

# Pressure regulators MS4/MS6-LR, MS series

Technical data

## Materials

Sectional view



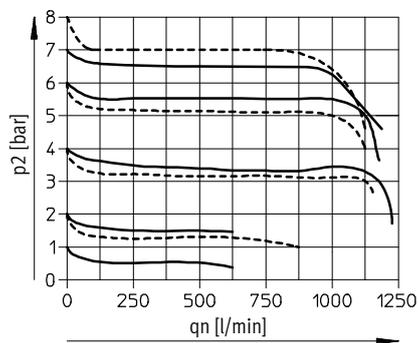
### Pressure regulator

1	Housing	Die-cast aluminium
2	Rotary knob	PA/POM
	Rotary knob with integrated lock	Aluminium
	E11	
3	Diaphragm	NBR
4	Cap, bottom	PET
5	Springs	Steel
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE only with cover plate VS

## Standard flow rate $q_n$ as a function of output pressure $p_2$

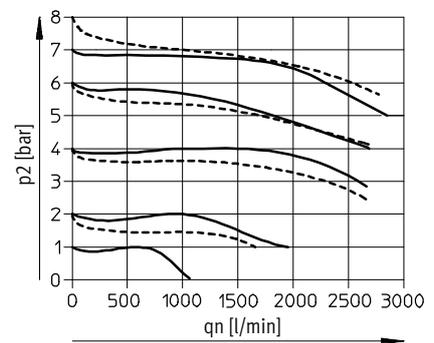
Input pressure  $p_1 = 10$  bar

MS4-LR-1/8



— D6: 0.3 ... 7 bar  
 - - - D7: 0.5 ... 12 bar<sup>1)</sup>

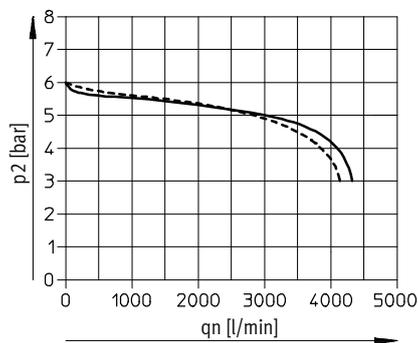
MS4-LR-1/4



1) There is a higher initial pressure drop for the characteristic curve of the DM1/DM2 variant.

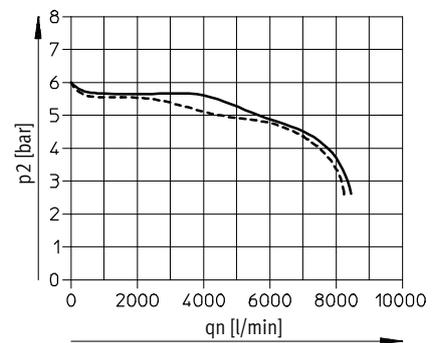
MS6-LR-1/4

Input pressure  $p_1 = 10$  bar



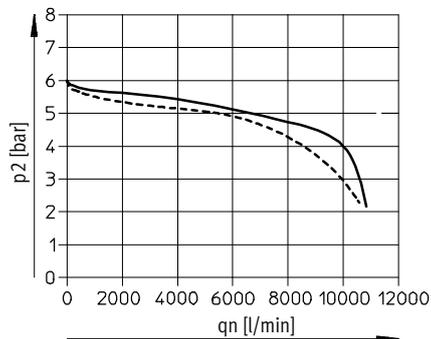
— D6: 0.3 ... 7 bar  
 - - - D7: 0.5 ... 12 bar

MS6-LR-3/8



MS6-LR-1/2

Input pressure  $p_1 = 10$  bar



— D6: 0.3 ... 7 bar  
 - - - D7: 0.5 ... 12 bar

# Pressure regulators MS4/MS6-LR, MS series

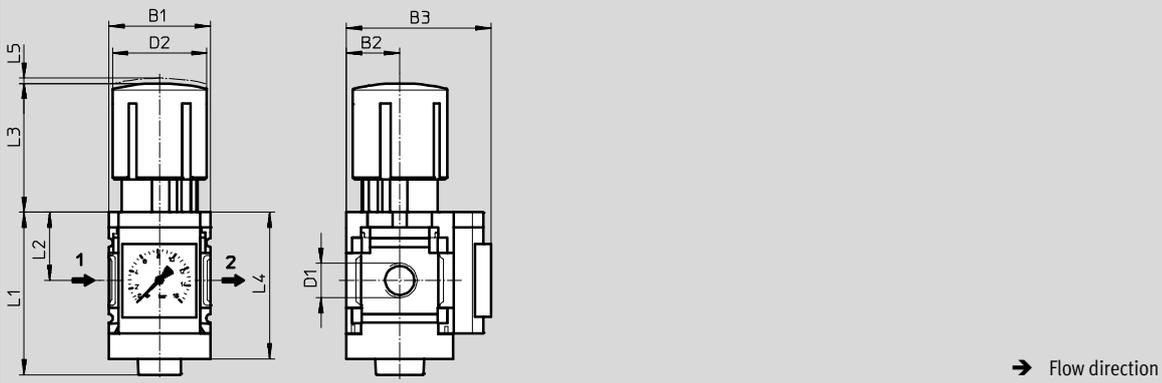
Technical data

**FESTO**

## Dimensions – Basic version

Download CAD data → [www.festo.com](http://www.festo.com)

Integrated pressure gauge, display unit [bar], standard rotary knob with detent



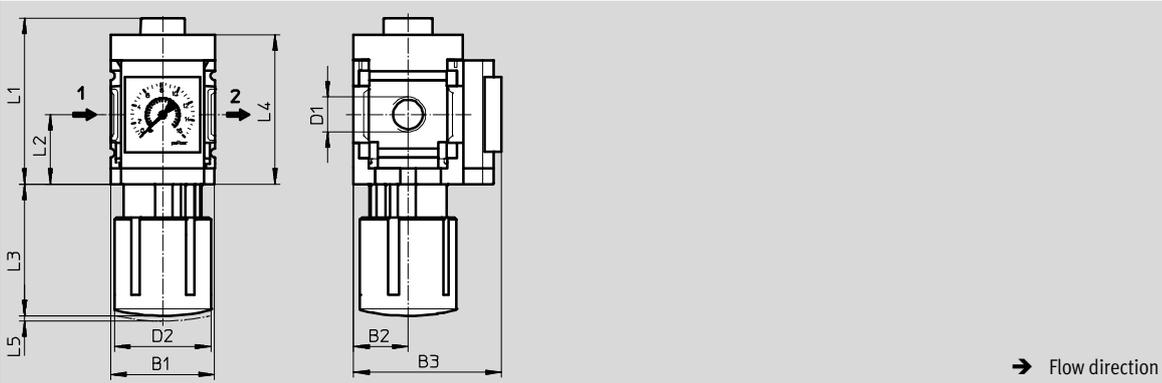
Type	B1	B2	B3		D1	D2	L1	L2	L3	L4	L5
			Standard scale	Red-green scale							
MS4-LR-1/8	40	21	57	58.5	G1/8	37.2	64.4	27	51.1	58.5	2
MS4-LR-1/4					G1/4						
MS6-LR-1/4	62	31	77	78.5	G1/4	51.2	94	39	86	85	5
MS6-LR-3/8					G3/8						
MS6-LR-1/2					G1/2						

Note: This product conforms to ISO 1179-1 and to ISO 228-1

## Dimensions – Alternative mounting position

Download CAD data → [www.festo.com](http://www.festo.com)

Rotary knob underneath KD



Type	B1	B2	B3	D1	D2	L1	L2	L3	L4	L5
MS4-LR-1/8-...-KD	40	21	57	G1/8	37.2	64.4	27	51.1	58.5	2
MS4-LR-1/4-...-KD				G1/4						
MS6-LR-1/4-...-KD	62	31	77	G1/4	51.2	94	39	86	85	5
MS6-LR-3/8-...-KD				G3/8						
MS6-LR-1/2-...-KD				G1/2						

Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS4/MS6-LR, MS series

Technical data

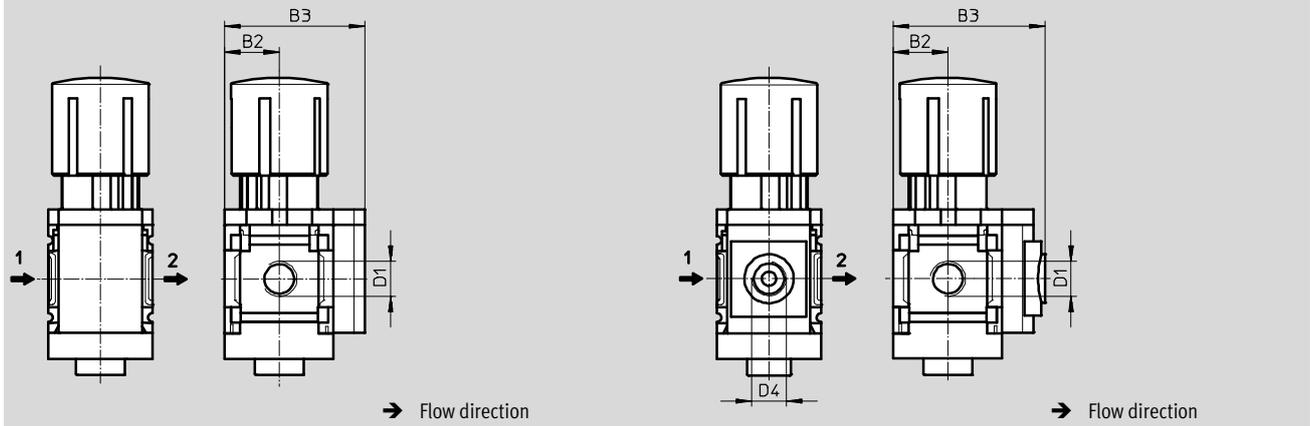
FESTO

## Dimensions – Pressure gauge alternatives

Download CAD data → [www.festo.com](http://www.festo.com)

Cover plate VS

Adapter plate A8/A4 for EN pressure gauge 1/8/1/4, without pressure gauge



Type	B2	B3	D1	D4
MS4-LR-1/8-...-VS	21	54	G1/8	-
MS4-LR-1/4-...-VS			G1/4	
MS4-LR-1/8-...-A8	21	58.5	G1/8	G1/8
MS4-LR-1/4-...-A8			G1/4	
MS4-LR-1/8-...-A4	21	58.5	G1/8	G1/4
MS4-LR-1/4-...-A4			G1/4	
MS6-LR-1/4-...-VS	31	76	G1/4	-
MS6-LR-3/8-...-VS			G3/8	
MS6-LR-1/2-...-VS			G1/2	
MS6-LR-1/4-...-A4	31	78.5	G1/4	G1/4
MS6-LR-3/8-...-A4			G3/8	
MS6-LR-1/2-...-A4			G1/2	

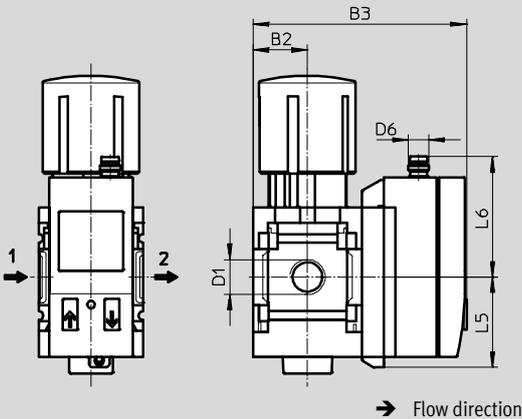
Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS4/MS6-LR, MS series

Technical data

**FESTO**

**Dimensions – Pressure gauge alternatives** Download CAD data → [www.festo.com](http://www.festo.com)  
 Pressure sensor with LCD display AD1 ... AD4 Technical data → Internet: [sde1](#)



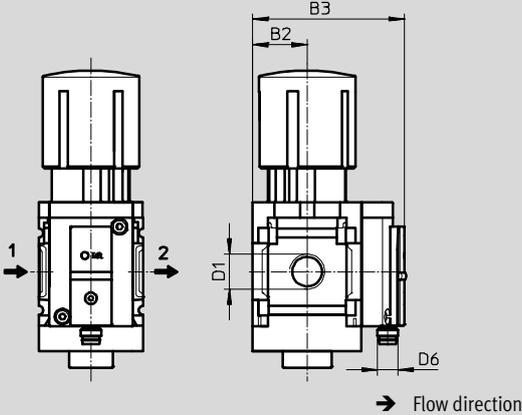
Variant AD1:  
SDE1-D10-G2-MS-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

Variant AD2:  
SDE1-D10-G2-MS-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

Variant AD3:  
SDE1-D10-G2-MS-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

Variant AD4:  
SDE1-D10-G2-MS-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

Pressure sensor without LCD display (operational status indicator only) AD7 ... AD10 Technical data → Internet: [sde5](#)



Variant AD7:  
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

Variant AD8:  
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

Variant AD9:  
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

Variant AD10:  
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

Type	B2	B3	D1	D6	L5	L6
MS4-LR-1/8-...-AD1/AD2	21	82.6	G1/8	M8x1	35.1	46.7
MS4-LR-1/4-...-AD1/AD2			G1/4			
MS4-LR-1/8-...-AD3/AD4	21	82.6	G1/8	M12x1	35.1	55.8
MS4-LR-1/4-...-AD3/AD4			G1/4			
MS4-LR-1/8-...-AD7/AD8/AD9/AD10	21	59.1	G1/8	M8x1	-	-
MS4-LR-1/4-...-AD7/AD8/AD9/AD10			G1/4			
MS6-LR-1/4-...-AD1/AD2	31	103	G1/4	M8x1	35.1	46.7
MS6-LR-3/8-...-AD1/AD2			G3/8			
MS6-LR-1/2-...-AD1/AD2			G1/2			
MS6-LR-1/4-...-AD3/AD4	31	103	G1/4	M12x1	35.1	55.8
MS6-LR-3/8-...-AD3/AD4			G3/8			
MS6-LR-1/2-...-AD3/AD4			G1/2			
MS6-LR-1/4-...-AD7/AD8/AD9/AD10	31	79	G1/4	M8x1	-	-
MS6-LR-3/8-...-AD7/AD8/AD9/AD10			G3/8			
MS6-LR-1/2-...-AD7/AD8/AD9/AD10			G1/2			

◆ Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS4/MS6-LR, MS series

Technical data

FESTO

## Dimensions – Rotary knob

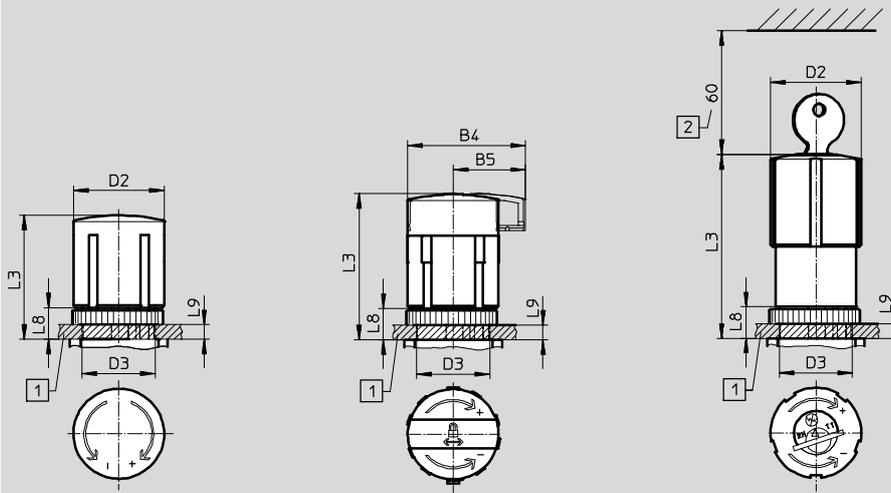
Download CAD data → [www.festo.com](http://www.festo.com)

For installation into control panel

Standard rotary knob with detent

Standard rotary knob with detent,  
lockable via accessories AS

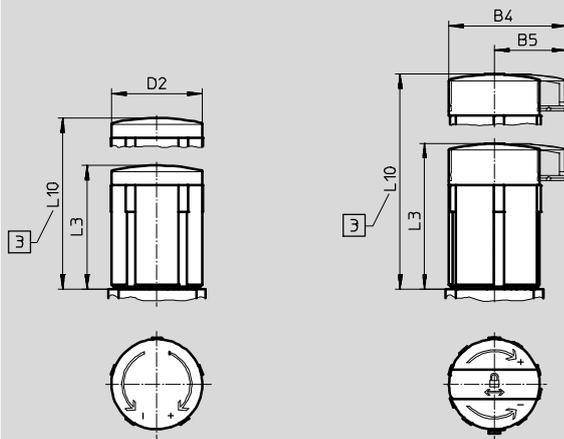
Rotary knob with integrated lock  
E11



- 1 Max. control panel thickness
- 2 Installation dimensions

Long rotary knob with detent LD

Long rotary knob with detent,  
lockable via accessories LD-AS



- 3 For pressure adjustment: pull out telescopic rotary knob fully

Type	B4	B5	D2	D3 +1	L3	L8	L9	L10
MS4-LR-...	-	-	37.2	30	51.1	13	6	-
MS4-LR-...-AS	48.6	30			60.2			
MS4-LR-...-E11	-	-			76			
MS4-LR-...-LD	-	-	37.2	-	51.1	-	-	76.8
MS4-LR-...-LD-AS	48.6	30			60			85.7
MS6-LR-...	-	-	51.2	44	86	22	14	-
MS6-LR-...-AS	64.4	38.8			93			
MS6-LR-...-E11	-	-			110			
MS6-LR-...-LD	-	-	51.2	-	86	-	-	139
MS6-LR-...-LD-AS	64.4	38.8			95.5			148.5

# Pressure regulators MS4/MS6-LR, MS series

Technical data

FESTO

Download CAD data → [www.festo.com](http://www.festo.com)

**Dimensions – Rotary knob with pressure gauge**

Small DM1 Large DM2

MS4

MS4

MS6

→ Flow direction

- Note  
Due to the protruding rotary knob, only a distributor block MS4-FRM-FRZ or a branching module MS4-FRM can be connected as a directly adjacent service unit component.

Type	D2	D3	L3	L4	L8	L9
MS4-LR-...-DM1	37.2	M30x1.5	54	58.5	13	6.7
MS4-LR-...-DM2	51.2	M48x1.5	56	60.5	13	7
MS6-LR-...-DM2	51	M44x1	84	94	25	18

## Pressure regulators MS4/MS6-LR, MS series

FESTO

Technical data

Ordering data							
Integrated pressure gauge, display unit [bar], standard rotary knob with detent, lockable via accessories							
Size	Connection	Pressure regulation range 0.3 ... 4 bar		Pressure regulation range 0.3 ... 7 bar		Pressure regulation range 0.5 ... 12 bar	
		Part No.	Type	Part No.	Type	Part No.	Type
MS4	G $\frac{1}{8}$	529421	MS4-LR- $\frac{1}{8}$ -D5-AS	529423	MS4-LR- $\frac{1}{8}$ -D6-AS	529425	MS4-LR- $\frac{1}{8}$ -D7-AS
	G $\frac{1}{4}$	529415	MS4-LR- $\frac{1}{4}$ -D5-AS	529417	MS4-LR- $\frac{1}{4}$ -D6-AS	529419	MS4-LR- $\frac{1}{4}$ -D7-AS
MS6	G $\frac{1}{4}$	529995	MS6-LR- $\frac{1}{4}$ -D5-AS	529997	MS6-LR- $\frac{1}{4}$ -D6-AS	529999	MS6-LR- $\frac{1}{4}$ -D7-AS
	G $\frac{3}{8}$	530001	MS6-LR- $\frac{3}{8}$ -D5-AS	530003	MS6-LR- $\frac{3}{8}$ -D6-AS	530005	MS6-LR- $\frac{3}{8}$ -D7-AS
	G $\frac{1}{2}$	529989	MS6-LR- $\frac{1}{2}$ -D5-AS	529991	MS6-LR- $\frac{1}{2}$ -D6-AS	529993	MS6-LR- $\frac{1}{2}$ -D7-AS

Ordering data – Wearing parts kits		
Size	Part No.	Type
MS4	673649	MS4-LR/LRB
MS6	673650	MS6-LR/LRB

# Pressure regulators MS4/MS6-LR, MS series

Ordering data – Modular products

Ordering table						
Grid dimension	[mm]	40	62	Condi- tions	Code	Enter code
<b>M</b>	Module No.	<b>527690</b>		<b>527663</b>		
	Series	Standard			<b>MS</b>	MS
	Size	4	6		...	
	Function	Pressure regulator			<b>-LR</b>	-LR
	Pneumatic connection	Female thread G $\frac{1}{8}$	–	<b>1</b>	<b>-<math>\frac{1}{8}</math></b>	
		Female thread G $\frac{1}{4}$	Female thread G $\frac{1}{4}$	<b>1</b>	<b>-<math>\frac{1}{4}</math></b>	
		–	Female thread G $\frac{3}{8}$	<b>1</b>	<b>-<math>\frac{3}{8}</math></b>	
		–	Female thread G $\frac{1}{2}$	<b>1</b>	<b>-<math>\frac{1}{2}</math></b>	
		Connecting plate G $\frac{1}{8}$	–		<b>-AGA</b>	
		Connecting plate G $\frac{1}{4}$	Connecting plate G $\frac{1}{4}$		<b>-AGB</b>	
		Connecting plate G $\frac{3}{8}$	Connecting plate G $\frac{3}{8}$		<b>-AGC</b>	
		–	Connecting plate G $\frac{1}{2}$		<b>-AGD</b>	
		–	Connecting plate G $\frac{3}{4}$		<b>-AGE</b>	
		Connecting plate NPT $\frac{1}{8}$	–	<b>1</b>	<b>-AQK</b>	
		Connecting plate NPT $\frac{1}{4}$	Connecting plate NPT $\frac{1}{4}$	<b>1</b>	<b>-AQN</b>	
		Connecting plate NPT $\frac{3}{8}$	Connecting plate NPT $\frac{3}{8}$	<b>1</b>	<b>-AQP</b>	
		–	Connecting plate NPT $\frac{1}{2}$	<b>1</b>	<b>-AQR</b>	
		–	Connecting plate NPT $\frac{3}{4}$	<b>1</b>	<b>-AQS</b>	
	Pressure regulation range/ operation	0.3 ... 4 bar, manually operated			<b>-D5</b>	
		0.3 ... 7 bar, manually operated			<b>-D6</b>	
		0.5 ... 12 bar, manually operated			<b>-D7</b>	
		–	0.5 ... 16 bar, manually operated	<b>1 4</b>	<b>-D8</b>	
<b>O</b>	Pressure gauge alternatives	Cover plate			<b>-VS</b>	
		Adapter plate for EN pressure gauge $\frac{1}{8}$ , without pressure gauge	–		<b>-A8</b>	
		Adapter plate for EN pressure gauge $\frac{1}{4}$ , without pressure gauge			<b>-A4</b>	
		Integrated pressure gauge, red-green scale		<b>2 3 4</b>	<b>-RG</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output PNP, 3-pin		<b>1 2 5</b>	<b>-AD1</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output NPN, 3-pin		<b>1 2 5</b>	<b>-AD2</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA		<b>1 2 5</b>	<b>-AD3</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA		<b>1 2 5</b>	<b>-AD4</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact		<b>1 2 5</b>	<b>-AD7</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact		<b>1 2 5</b>	<b>-AD8</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact		<b>1 2 5</b>	<b>-AD9</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact		<b>1 2 5</b>	<b>-AD10</b>	

**1**  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ , **AQK, AQN, AQP, AQR, AQS, D8, AD1 ... AD4, AD7 ... AD10, DM1, DM2, KD, E11, WPM**

Not with EU certification EX4

**3** **RG, OS, KD, AS**

Not with rotary knob alternative DM1

**2** **RG, AD1 ... AD4, AD7 ... AD10, OS, KD, AS, WR, WB**

MS4: Not with rotary knob alternative DM2

**4** **D8, RG, OS, KD, AS**

MS6: Not with rotary knob alternative DM2

**M** Mandatory data

**O** Options

Transfer order code

**MS**  - **LR**  -  -

# Pressure regulators MS4/MS6-LR, MS series

Ordering data – Modular products

Ordering table						
Grid dimension	[mm]	40	62	Condi- tions	Code	Enter code
0	Alternative pressure gauge scale	psi		6	-PSI	
		MPa		7	-MPA	
	Secondary venting	Without secondary venting		2 3 4	-OS	
	Rotary knob alternative	Long rotary knob		8	-LD	
		Rotary knob pressure gauge, small	-	1 8 9	-DM1	
		Rotary knob pressure gauge, large		1 8 9	-DM2	
	Alternative mounting position	Rotary knob underneath		1 2 3 4 10	-KD	
	Security	Lockable via accessories		2 3 4	-AS	
		With integrated lock		1	-E11	
	Type of mounting	Mounting bracket with knurled nut for regulator head		2 11	-WR	
		Mounting bracket standard design		12	-WP	
		Mounting bracket for attaching the service units		1 12	-WPM	
		Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required		2	-WB	
		Mounting bracket centrally at rear (wall mounting top), connecting plates not required	-			-WBM
	EU certification	II 2GD to EU Directive 94/9/EG			-EX4	
	UL certification	cULus, ordinary location for Canada and USA			-UL1	
	Flow direction	Flow direction from right to left			-Z	

5 AD1 ... AD4, AD7 ... AD10

Measuring range max. 10 bar  
Not with pressure regulation range D8

6 PSI

Not with pressure gauge alternatives VS, A8, A4, RG, AD1 ... AD4, AD7 ... AD10

7 MPA

Not with pressure gauge alternatives VS, A8, A4, AD1 ... AD4, AD7 ... AD10  
Not with rotary knob alternative DM1, DM2

8 LD, DM1, DM2

Not with integrated lock E11

9 DM1, DM2

Can only be combined with one pressure gauge alternative VS, A8, A4, AD1 ... AD4, AD7 ... AD10

10 KD

Not with pressure gauge alternative RG  
Not with alternative pressure gauge scale MPA  
Not with mounting type WP

11 WR

Not with long rotary knob LD

12 WP, WPM

Only with connecting plate AGA, AGB, AGC, AGD, AGE, AQK, AQN, AQP, AQR or AQS

M Mandatory data

O Options

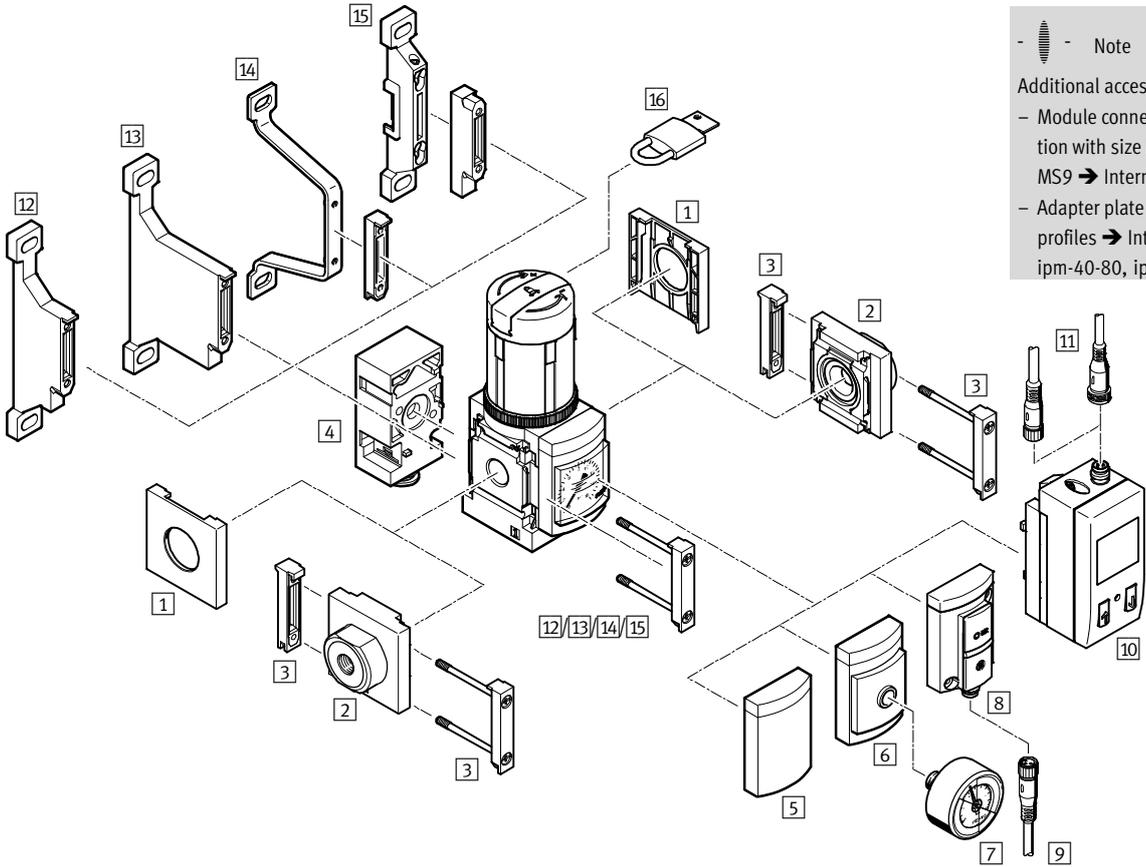
Transfer order code

- [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

# Pressure regulators MS4/MS6-LRB, MS series

Peripherals overview

## Pressure regulator MS4/MS6-LRB with pressure output to the rear



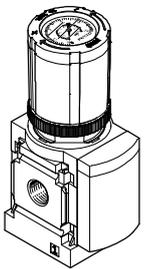
Note

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 → Internet: amv, rmv, armv
- Adapter plate for mounting on profiles → Internet: ipm-80, ipm-40-80, ipm-80-80

## Pressure regulator with rotary knob pressure gauge

MS4-LRB...-DM1/  
MS6-LRB...-DM2



# Pressure regulators MS4/MS6-LRB, MS series

Peripherals overview

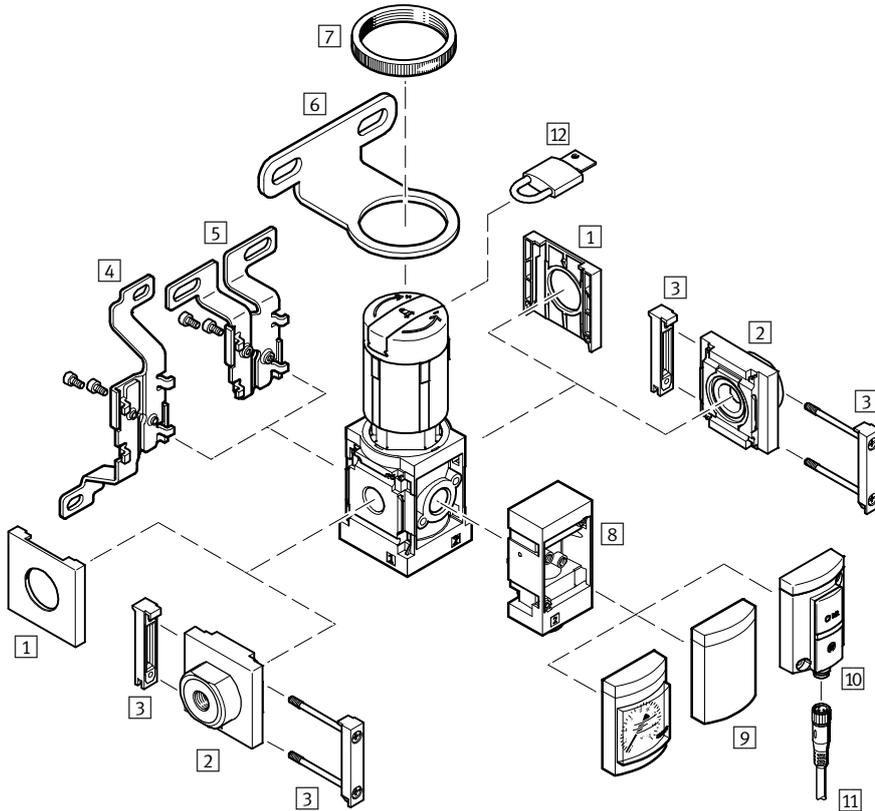
Mounting attachments and accessories						
		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS4/6-END	■	-	■	-	ms4-end, ms6-end
2	Connecting plate-SET MS4/6-AG...	-	■	-	■	ms4-ag, ms6-ag
3	Module connector MS4/6-MV	-	■	■	■	ms4-mv, ms6-mv
4	Angled outlet block B...	■	■	■	■	34
5	Cover plate VS	■	■	■	■	34
6	Adapter plate for EN pressure gauge 1/8/1/4 A8/A4	■	■	■	■	34
7	Pressure gauge MA	■	■	■	■	95
8	Pressure sensor without display AD7 ... AD10	■	■	■	■	34
9	Connecting cable NEBU-M8...-LE3	■	■	■	■	95
10	Pressure sensor with display AD1 ... AD4	■	■	■	■	34
11	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■	■	■	■	95
12	Mounting bracket MS4/6-WP	-	■	■	■	ms4-wp, ms6-wp
13	Mounting bracket MS4/6-WPB	-	■	■	■	ms4-wp, ms6-wp
14	Mounting bracket MS4/6-WPE	-	■	■	■	ms4-wp, ms6-wp
15	Mounting bracket MS4/6-WPM	-	■	■	■	ms4-wp, ms6-wp
16	Padlock LRVS-D	■	■	■	■	95

# Pressure regulators MS4/MS6-LRB, MS series

Peripherals overview

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## Pressure regulator MS4/MS6-LRB with pressure output to the front



Note

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 → Internet: amv, rmv, armv
- Adapter plate for mounting on profiles → Internet: ipm-80, ipm-40-80, ipm-80-80

Mounting attachments and accessories						
		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS4/6-END	■	-	■	-	ms4-end, ms6-end
2	Connecting plate-SET MS4/6-AG...	-	■	-	■	ms4-ag, ms6-ag
3	Module connector MS4/6-MV	-	■	■	■	ms4-mv, ms6-mv
4	Mounting bracket MS4/6-WB	■	■	-	-	ms4-wb, ms6-wb
5	Mounting bracket MS4-WBM	■	■	-	-	ms4-wbm
6	Mounting bracket MS4/6-WR	■	■	-	-	ms4-wr, ms6-wr
7	Knurled nut (included in scope of delivery) MS-LR	■	■	-	-	-
8	Angled outlet block B...	■	■	■	■	34
9	Cover plate VS	■	■	■	■	34
10	Pressure sensor without display AD7 ... AD10	■	■	■	■	34
11	Connecting cable NEBU-M8...-LE3	■	■	■	■	95
12	Padlock LRVS-D	■	■	■	■	95

# Pressure regulators MS4/MS6-LRB, MS series

Type codes

MS 6 - LRB - 1/2 - D7 - [ ] - AS - BD

**Series**

MS	Standard service unit
----	-----------------------

**Size**

4	Grid dimension 40 mm
6	Grid dimension 62 mm

**Service function**

LRB	Pressure regulator for manifold assembly
-----	--

**Connection size**

MS4	
1/4	Thread G1/4
MS6	
1/2	Thread G1/2

**Pressure regulation range**

D5	0.3 ... 4 bar
D6	0.3 ... 7 bar
D7	0.5 ... 12 bar

**Pressure gauge alternatives**

	Integrated pressure gauge
A8	Adapter plate for EN pressure gauge 1/8, without pressure gauge
A4	Adapter plate for EN pressure gauge 1/4, without pressure gauge

**Security**

AS	Standard rotary knob with detent, lockable via accessories
----	--

**Pressure output**

	Without angled outlet block
BD	Angled outlet block QS-8

**Additional variants can be ordered using the modular system → 34**

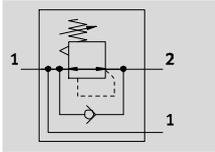
- Connecting plates
- Pressure regulation range
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Secondary venting
- Rotary knob alternative
- Alternative mounting position
- Security
- Pressure output
- Type of mounting
- EU certification
- UL certification
- Flow direction

# Pressure regulators MS4/MS6-LRB, MS series

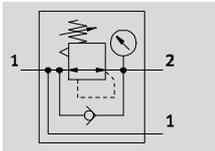
Technical data

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Without pressure gauge



With pressure gauge

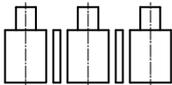


-  - Flow rate  
300 ... 7,300 l/min
-  - Temperature range  
-10 ... +60 °C
-  - Operating pressure  
0.8 ... 20 bar
-  - [www.festo.com](http://www.festo.com)

Wearing parts kits  
→ 33



The pressure regulator is suitable for manifold assemblies with through air supply, for configuring a regulator manifold with separate, independent pressure regulation ranges. Pressure output is to the front or rear.



- Good regulation characteristics with low hysteresis and primary pressure compensation
- Manifold assembly with through air supply
- For configuring a regulator manifold with independent pressure regulation ranges
- Regulator lock for protecting the values against adjustment
- Available with and without secondary venting
- Four pressure regulation ranges: 0.3 ... 4 bar, 0.3 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Return flow option for exhausting from output 2 to output 1 already integrated
- Optional pressure sensor
- Optional rotary knob pressure gauge
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		MS4	MS6
Size			
Pneumatic connection 1			
	Female thread	G $\frac{1}{4}$	G $\frac{1}{2}$
	Connecting plate AG...	G $\frac{1}{8}$ , G $\frac{1}{4}$ or G $\frac{3}{8}$	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ or G $\frac{3}{4}$
Pneumatic connection 2			
		G $\frac{1}{4}$	G $\frac{1}{2}$
		QS-6	QS-8
		QS-8	QS-10
Constructional design		Directly-actuated diaphragm regulator with through compressed air supply	
Regulating function		Output pressure constant, with primary pressure compensation, with return flow action, with/without secondary venting	
Type of mounting		Via accessories	
		In-line installation	
		Front panel mounting	
Mounting position		Any	
Regulator lock		Rotary knob with detent	
		Rotary knob with detent, lockable via accessories	
		Rotary knob with integrated lock	
Pressure regulation range/operation	D5 [bar]	0.3 ... 4, manually operated <sup>1)</sup>	
	D6 [bar]	0.3 ... 7, manually operated <sup>1)</sup>	
	D7 [bar]	0.5 ... 12, manually operated (0.5 ... 10 with pressure sensor AD... or with UL certification) <sup>1)</sup>	
	D8 [bar]		0.5 ... 16, manually operated (0.5 ... 10 with UL certification)
Max. hysteresis	[bar]	0.25	0.25 (0.4 with rotary knob pressure gauge DM2)
Pressure display		Via pressure sensor for displaying output pressure via LCD display and electrical output	
		Via pressure sensor for displaying output pressure via operational status indicator and electrical output	
		Via pressure gauge for displaying output pressure	
		Via pressure gauge with red/green scale for displaying output pressure	
		Via pressure gauge in rotary knob for displaying output pressure	
		G $\frac{1}{8}$ prepared	-
		G $\frac{1}{4}$ prepared	

1) MS4: For pressure regulators with rotary knob pressure gauge DM1, the pressure regulation range begins at 0.8 bar.

-  - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS4/MS6-LRB, MS series

Technical data

Standard nominal flow rate $q_{nN}^{1)}$ [l/min]							
Size		MS4			MS6		
		Standard	Angled outlet block		Standard	Angled outlet block	
			QS-6	QS-8		QS-8	QS-10
Pressure regulation range	D5	1,900 <sup>2)</sup>	300 <sup>2)</sup>	650 <sup>2)</sup>	7,300 <sup>2)</sup>	600 <sup>2)</sup>	750 <sup>2)</sup>
	D6	1,700	350	840	6,300	880	1,000
	D7	1,500 <sup>3)</sup>	350	640	5,500	800	950
	D8	–	–	–	4,500	750	850

1) Measured at  $p_1 = 10$  bar and  $p_2 = 6$  bar,  $\Delta p = 1$  bar

2) Measured at  $p_1 = 10$  bar and  $p_2 = 3$  bar,  $\Delta p = 1$  bar

3) In the case of the DM1/DM2 pressure regulator/gauge with rotary knob,  $q_{nN}$  is equal to 800 litres per minute and  $q_{n \max}$  amounts to 2,200 litres per minute.

Operating and environmental conditions		
Size	MS4	MS6
Operating pressure [bar]	0.8 ... 14 (0.8 ... 10) <sup>1)</sup>	0.8 ... 20 (0.8 ... 10) <sup>1)</sup>
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4] Inert gases	
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)	
Ambient temperature [°C]	–10 ... +60 (0 ... +50) <sup>2)</sup>	
Temperature of medium [°C]	–10 ... +60 (0 ... +50) <sup>2)</sup>	
Storage temperature [°C]	–10 ... +60	
Corrosion resistance class CRC <sup>3)</sup>	2	
UL certification	cULus recognized (OL)	

1) Value in brackets applies to MS4/MS6-LRB with UL certification.

2) Value in brackets applies to MS4/MS6-LRB with pressure sensor AD... .

3) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	c T6 X
ATEX category dust	II 2D
EX-ignition protection type dust	c 60 °C X
ATEX ambient temperature	–10 °C ≤ Ta ≤ +60 °C
CE mark (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Weight [g]		
Size	MS4	MS6
Pressure regulator	222	747
Pressure regulator with rotary knob with integrated lock E11	347	1,017

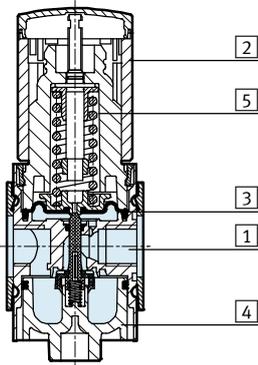
# Pressure regulators MS4/MS6-LRB, MS series

Technical data



## Materials

Sectional view



Pressure regulator (manifold assembly)

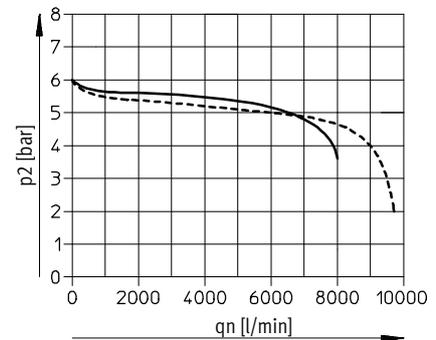
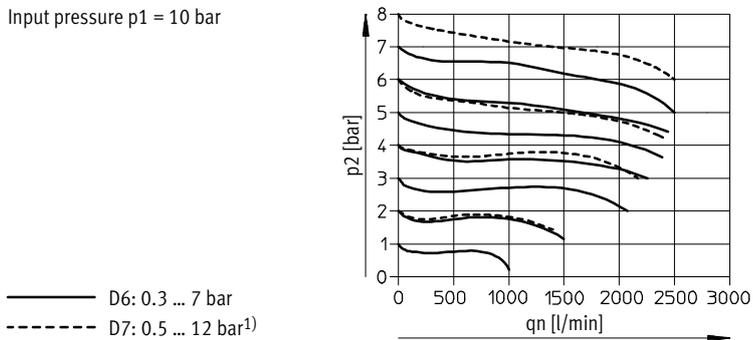
1	Housing	Die-cast aluminium
2	Rotary knob	PA/POM
	Rotary knob with integrated lock E11	Aluminium
3	Diaphragm	NBR
4	Cap, bottom	PET
5	Springs	Steel
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE only with cover plate VS

## Standard flow rate $q_n$ as a function of output pressure $p_2$

MS4-LRB-1/4

MS6-LRB-1/2

Input pressure  $p_1 = 10$  bar



1) There is a higher initial pressure drop for the characteristic curve of the DM1 variant.

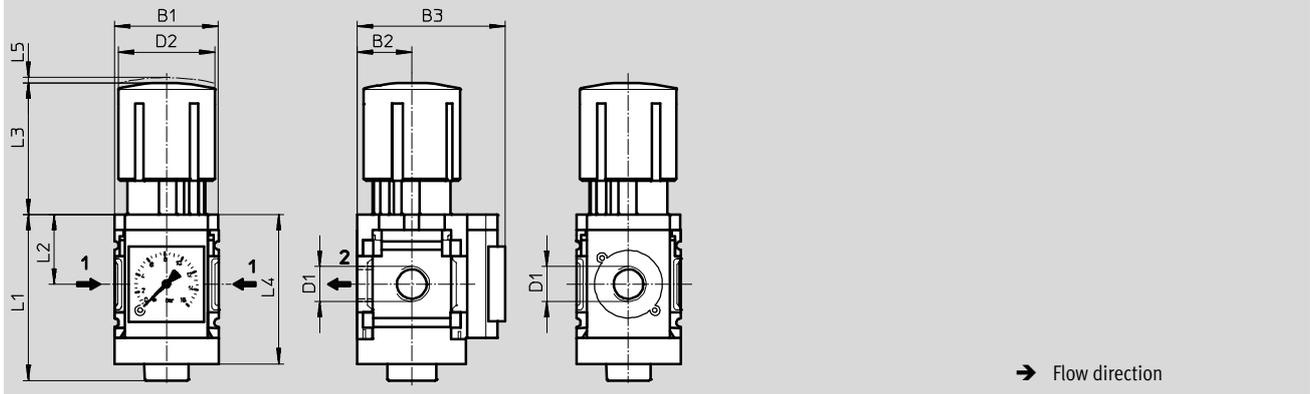
# Pressure regulators MS4/MS6-LRB, MS series

Technical data

## Dimensions – Basic version

Download CAD data → [www.festo.com](http://www.festo.com)

Integrated pressure gauge, display unit [bar], standard rotary knob with detent



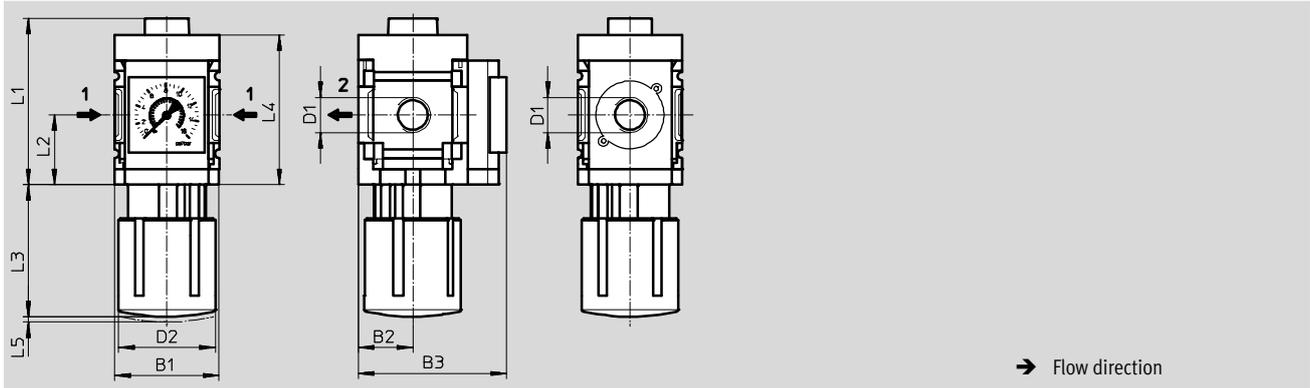
Type	B1	B2	B3		D1	D2	L1	L2	L3	L4	L5
			Standard scale	Red-green scale							
MS4-LRB-1/4	40	21	57	58.5	G1/4	37.2	64.4	27	51.1	58.5	2
MS6-LRB-1/2	62	31	77	78.5	G1/2	51.3	94	39	86	85	5

Note: This product conforms to ISO 1179-1 and to ISO 228-1

## Dimensions – Alternative mounting position

Download CAD data → [www.festo.com](http://www.festo.com)

Rotary knob underneath KD



Type	B1	B2	B3	D1	D2	L1	L2	L3	L4	L5
MS4-LRB-1/4-...-KD	40	21	57	G1/4	37.2	64.4	27	51.1	58.5	2
MS6-LRB-1/2-...-KD	62	31	77	G1/2	51.2	94	39	86	85	5

Note: This product conforms to ISO 1179-1 and to ISO 228-1

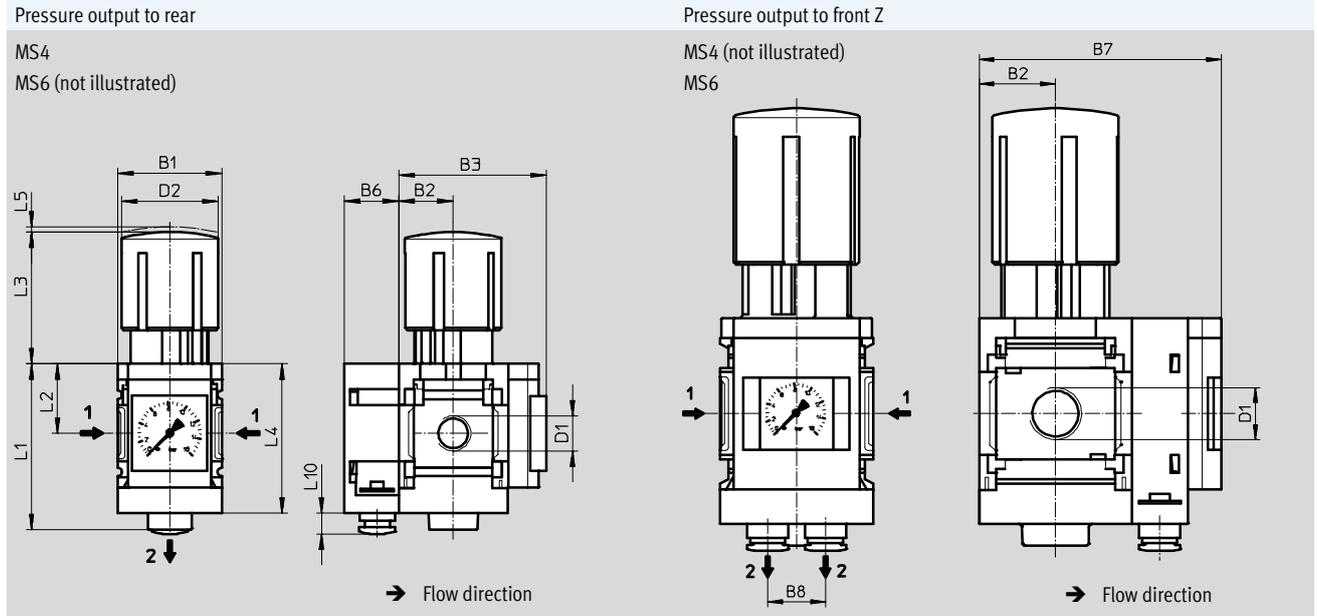
# Pressure regulators MS4/MS6-LRB, MS series

Technical data

**FESTO**

## Dimensions – Angled outlet block BC/BD/BE

Download CAD data → [www.festo.com](http://www.festo.com)

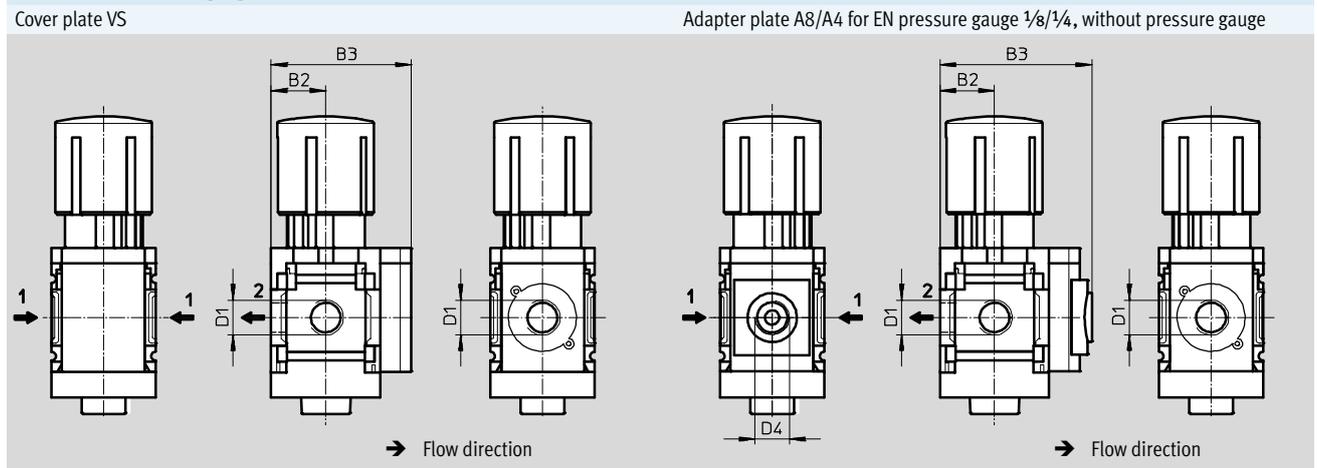


Type	B1	B2	B3	B6	B7	B8	D1	D2	L1	L2	L3	L4	L5	L10
MS4-LRB-1/4-...-B...	40	21	57	21	75	-	G1/4	37.2	64.4	27	51.1	58.5	2	8
MS6-LRB-1/2-...-B...	62	31	77	23	99	23.4	G1/2	51.2	94	39	86	85	5	11

Note: This product conforms to ISO 1179-1 and to ISO 228-1

## Dimensions – Pressure gauge alternatives

Download CAD data → [www.festo.com](http://www.festo.com)



Type	B2	B3	D1	D4
MS4-LRB-1/4-...-VS	21	54	G1/4	-
MS4-LRB-1/4-...-A8	21	58.5	G1/4	G1/8
MS4-LRB-1/4-...-A4	21	58.5	G1/4	G1/4
MS6-LRB-1/2-...-VS	31	76	G1/2	-
MS6-LRB-1/2-...-A4	31	78.5	G1/2	G1/4

Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS4/MS6-LRB, MS series

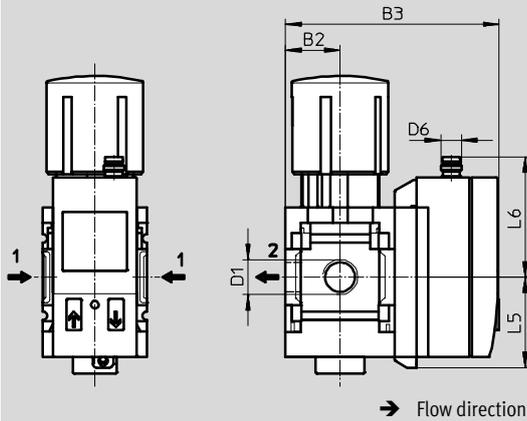
Technical data

## Dimensions – Pressure gauge alternatives

Download CAD data → [www.festo.com](http://www.festo.com)

Pressure sensor with LCD display AD1 ... AD4

Technical data → Internet: [sde1](#)



Variant AD1:  
SDE1-D10-G2-MS-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

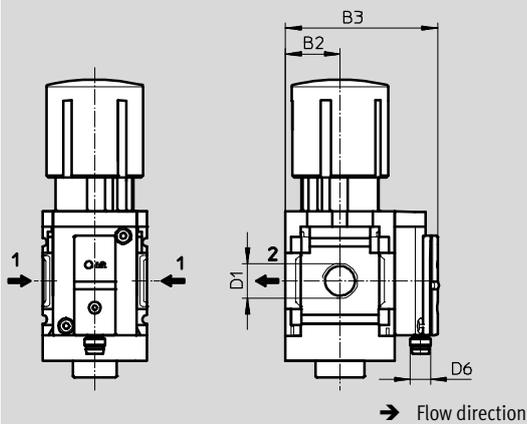
Variant AD3:  
SDE1-D10-G2-MS-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

Variant AD2:  
SDE1-D10-G2-MS-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

Variant AD4:  
SDE1-D10-G2-MS-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

## Pressure sensor without LCD display (operational status indicator only) AD7 ... AD10

Technical data → Internet: [sde5](#)



Variant AD7:  
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

Variant AD9:  
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

Variant AD8:  
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

Variant AD10:  
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

Type	B2	B3	D1	D6	L5	L6
MS4-LRB-1/4-...-AD1/AD2	21	82.6	G1/4	M8x1	35.1	46.7
MS4-LRB-1/4-...-AD3/AD4	21	82.6	G1/4	M12x1	35.1	55.8
MS4-LRB-1/4-...-AD7/AD8/AD9/AD10	21	59.1	G1/4	M8x1	–	–
MS6-LRB-1/2-...-AD1/AD2	31	103	G1/2	M8x1	35.1	46.7
MS6-LRB-1/2-...-AD3/AD4	31	103	G1/2	M12x1	35.1	55.8
MS6-LRB-1/2-...-AD7/AD8/AD9/AD10	31	79	G1/2	M8x1	–	–

– | – Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS4/MS6-LRB, MS series

Technical data

FESTO

## Dimensions – Rotary knob

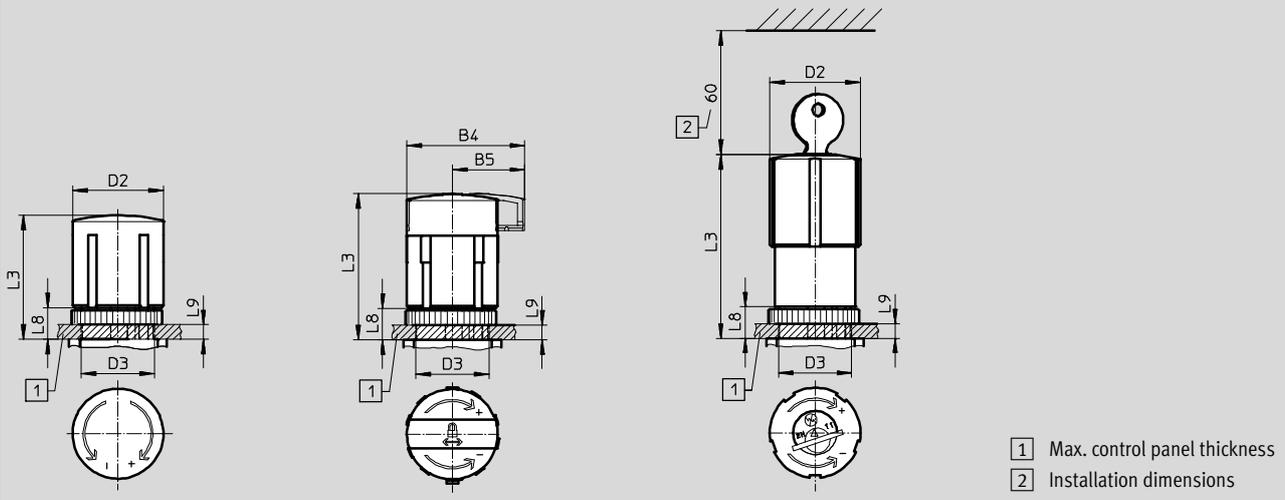
Download CAD data → [www.festo.com](http://www.festo.com)

For installation into control panel

Standard rotary knob with detent

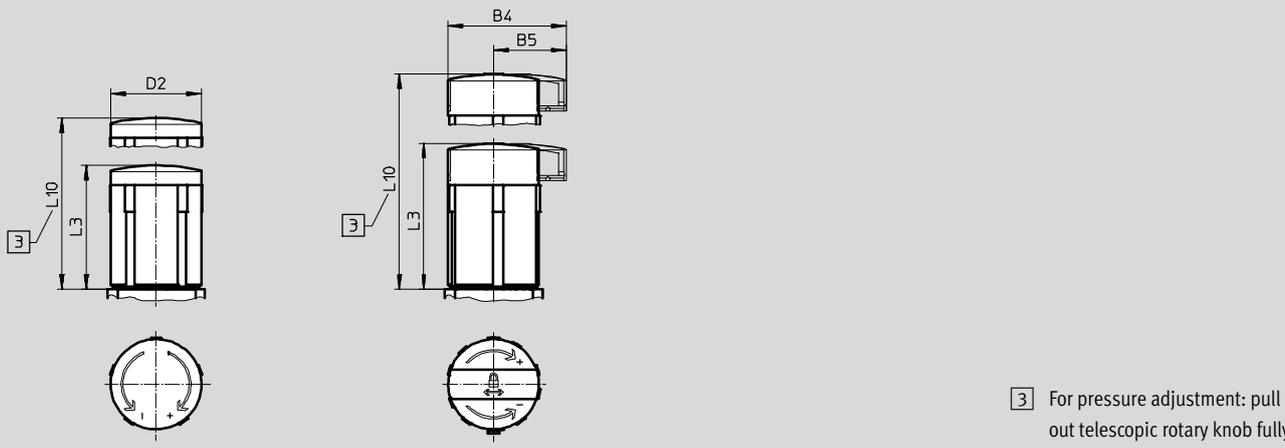
Standard rotary knob with detent,  
lockable via accessories AS

Rotary knob with integrated lock  
E11



Long rotary knob with detent LD

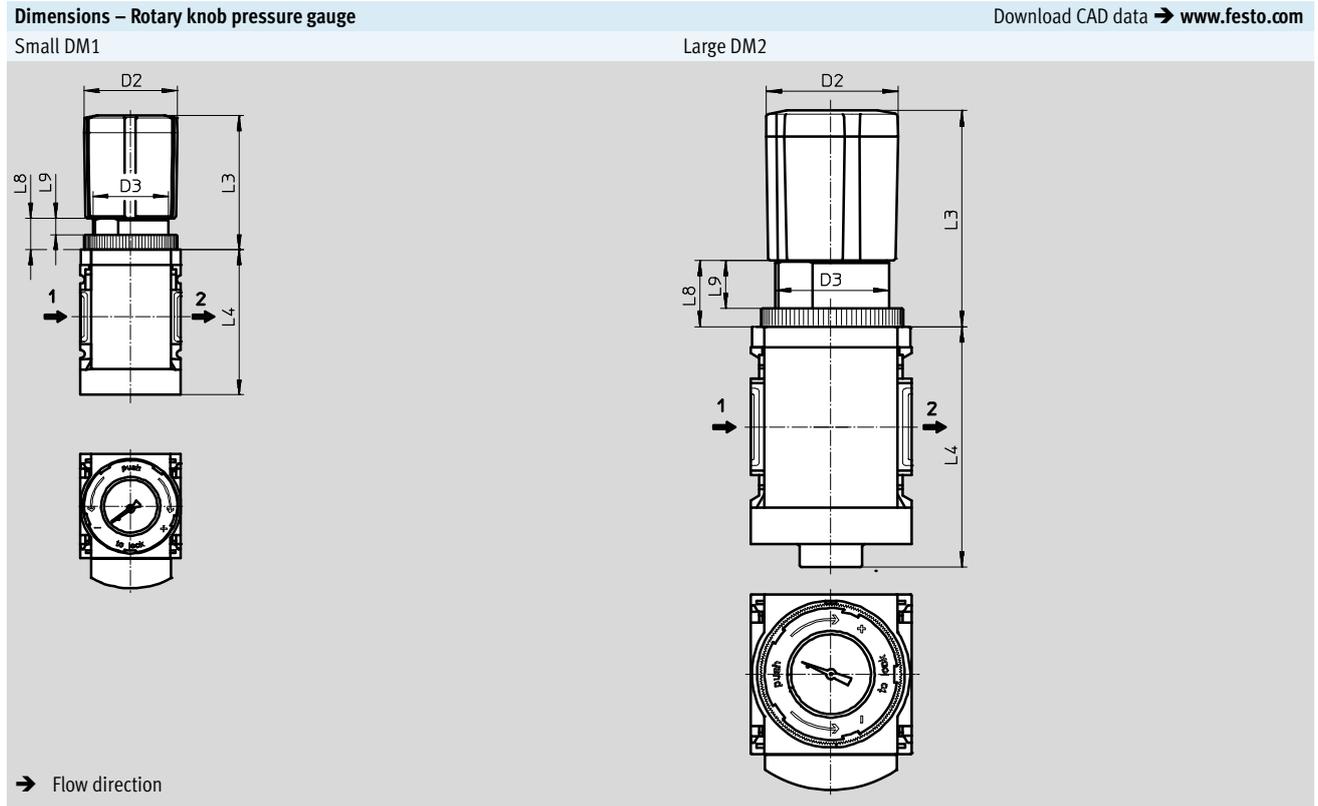
Long rotary knob with detent,  
lockable via accessories LD-AS



Type	B4	B5	D2	D3 +1	L3	L8	L9	L10
MS4-LRB-...	-	-	37.2	30	51.1	13	6	-
MS4-LRB-...-AS	48.6	30			60.2			
MS4-LRB-...-E11	-	-			76			
MS4-LRB-...-LD	-	-	37.2	-	51.1	-	-	76.8
MS4-LRB-...-LD-AS	48.6	30			60			85.7
MS6-LRB-...	-	-	51.2	44	86	22	14	-
MS6-LRB-...-AS	64.4	38.8			93			
MS6-LRB-...-E11	-	-			110			
MS6-LRB-...-LD	-	-	51.2	-	86	-	-	139
MS6-LRB-...-LD-AS	64.4	38.8			95.5			148.5

# Pressure regulators MS4/MS6-LRB, MS series

Technical data



Type	D2	D3	L3	L4	L8	L9
MS4-LRB-...-DM1	37.2	M30x1.5	56	58.5	13	6.7
MS6-LRB-...-DM2	51	M44x1	84	94	25	18

Ordering data							
Standard rotary knob with detent, lockable via accessories							
Size	Connection	Pressure regulation range 0.3 ... 4 bar		Pressure regulation range 0.3 ... 7 bar		Pressure regulation range 0.5 ... 12 bar	
		Part No.	Type	Part No.	Type	Part No.	Type
Integrated pressure gauge, display unit [bar], pressure output to rear without angled outlet block							
MS4	G1/4	529473	MS4-LRB-1/4-D5-AS	529479	MS4-LRB-1/4-D6-AS	529485	MS4-LRB-1/4-D7-AS
MS6	G1/2	530322	MS6-LRB-1/2-D5-AS	530328	MS6-LRB-1/2-D6-AS	530334	MS6-LRB-1/2-D7-AS
Integrated pressure gauge, display unit [bar], pressure output to rear with angled outlet block QS-8							
MS4	G1/4	529474	MS4-LRB-1/4-D5-AS-BD	529480	MS4-LRB-1/4-D6-AS-BD	529486	MS4-LRB-1/4-D7-AS-BD
MS6	G1/2	-	-	530329	MS6-LRB-1/2-D6-AS-BD	530335	MS6-LRB-1/2-D7-AS-BD
Adapter plate A8 for EN pressure gauge 1/8, pressure output to rear without angled outlet block							
MS4	G1/4	529471	MS4-LRB-1/4-D5-A8-AS	529477	MS4-LRB-1/4-D6-A8-AS	529483	MS4-LRB-1/4-D7-A8-AS
Adapter plate A4 for EN pressure gauge 1/4, pressure output to rear without angled outlet block							
MS6	G1/2	530320	MS6-LRB-1/2-D5-A4-AS	530326	MS6-LRB-1/2-D6-A4-AS	530332	MS6-LRB-1/2-D7-A4-AS

Ordering data – Wearing parts kits		
Size	Part No.	Type
MS4	673649	MS4-LR/LRB
MS6	673650	MS6-LR/LRB

# Pressure regulators MS4/MS6-LRB, MS series

Ordering data – Modular products



Ordering table							
Grid dimension	[mm]	40	62	Condi- tions	Code	Enter code	
<b>M</b>	Module No.	<b>527692</b>		<b>527665</b>			
	Series	Standard			<b>MS</b>	MS	
	Size	4	6		...		
	Function	Pressure regulator for manifold assembly			<b>-LRB</b>	-LRB	
	Pneumatic connection	Female thread G $\frac{1}{4}$	–	<b>1</b>	<b>-<math>\frac{1}{4}</math></b>		
		–	Female thread G $\frac{1}{2}$	<b>1</b>	<b>-<math>\frac{1}{2}</math></b>		
		Connecting plate G $\frac{1}{8}$	–		<b>-AGA</b>		
		Connecting plate G $\frac{1}{4}$	Connecting plate G $\frac{1}{4}$		<b>-AGB</b>		
		Connecting plate G $\frac{3}{8}$	Connecting plate G $\frac{3}{8}$		<b>-AGC</b>		
		–	Connecting plate G $\frac{1}{2}$		<b>-AGD</b>		
		–	Connecting plate G $\frac{3}{4}$		<b>-AGE</b>		
	Pressure regulation range/ operation	0.3 ... 4 bar, manually operated				<b>-D5</b>	
		0.3 ... 7 bar, manually operated				<b>-D6</b>	
		0.5 ... 12 bar, manually operated				<b>-D7</b>	
		–	0.5 ... 16 bar, manually operated		<b>1 2</b>	<b>-D8</b>	
<b>O</b>	Pressure gauge alternatives	Cover plate		<b>3</b>	<b>-VS</b>		
		Adapter plate for EN pressure gauge $\frac{1}{8}$ , without pressure gauge	–		<b>4</b>	<b>-A8</b>	
		Adapter plate for EN pressure gauge $\frac{1}{4}$ , without pressure gauge			<b>4</b>	<b>-A4</b>	
		Integrated pressure gauge, red-green scale			<b>2</b>	<b>-RG</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output PNP, 3-pin			<b>1 4 5</b>	<b>-AD1</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output NPN, 3-pin			<b>1 4 5</b>	<b>-AD2</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA			<b>1 4 5</b>	<b>-AD3</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA			<b>1 4 5</b>	<b>-AD4</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact			<b>1 5 6</b>	<b>-AD7</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact			<b>1 5 6</b>	<b>-AD8</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact			<b>1 5 6</b>	<b>-AD9</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact			<b>1 5 6</b>	<b>-AD10</b>	
		Alternative pressure gauge scale	psi		<b>7</b>	<b>-PSI</b>	
	MPa			<b>8</b>	<b>-MPA</b>		

**1**  $\frac{1}{4}$ ,  $\frac{1}{2}$ , **D8**, **AD1 ... AD4**, **AD7 ... AD10**, **DM1**, **DM2**, **KD**, **E11**, **WPM**

Not with EU certification EX4

**2** **D8**, **RG**, **OS**, **KD**, **AS**

Not with rotary knob pressure gauge DM1, DM2

**3** **VS**

Must be selected if flow direction Z is selected without alternative mounting position KD and without pressure output BC, BD, BE.

Must be selected if alternative mounting position KD is selected without flow direction Z and without pressure output BC, BD, BE

**M** Mandatory data

**O** Options

Transfer order code

**MS**  - **LRB** -  -  -  -

# Pressure regulators MS4/MS6-LRB, MS series

Ordering data – Modular products

Ordering table						
Grid dimension	[mm]	40	62	Condi- tions	Code	Enter code
0	Secondary venting	Without secondary venting		2	-OS	
	Rotary knob alternative	Long rotary knob		9	-LD	
Rotary knob pressure gauge, small		–		1 9 10	-DM1	
–		Rotary knob pressure gauge, large		1 9 10	-DM2	
Alternative mounting position	Rotary knob underneath		1 2 11	-KD		
Security	Lockable via accessories		2	-AS		
	With integrated lock		1	-E11		
Pressure output (p <sub>max</sub> = 10 bar)	Angled outlet block QS-6		–		-BC	
	Angled outlet block QS-8		Angled outlet block QS-8		-BD	
	–		Angled outlet block QS-10			-BE
Type of mounting	Mounting bracket with knurled nut for regulator head			12 13	-WR	
	Mounting bracket standard design			14 15	-WP	
	Mounting bracket for attaching the service units			1 12 14	-WPM	
	Mounting bracket for large wall gap			14 16	-WPB	
	Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required			12	-WB	
	Mounting bracket centrally at rear (wall mounting top), connecting plates not required		–		12	-WBM
EU certification	II 2GD to EU Directive 94/9/EG				-EX4	
UL certification	cULus, ordinary location for Canada and USA				-UL1	
Flow direction	Pressure output to front (without pressure output, no pressure gauge)				-Z	

**4 A8, A4, AD1 ... AD4**

Not with flow direction Z.  
In combination with flow direction Z only with alternative mounting position KD

**5 AD1 ... AD4, AD7 ... AD10**

Measuring range max. 10 bar  
Not with pressure regulation range D8

**6 AD7 ... AD10**

In combination with flow direction Z only with pressure output BC, BD, BE or  
In combination with flow direction Z only with alternative mounting position KD

**7 PSI**

Not with pressure gauge alternatives VS, A8, A4, RG, AD1 ... AD4, AD7 ... AD10  
In combination with flow direction Z only with pressure output BC, BD, BE

**8 MPA**

Not with pressure gauge alternatives VS, A8, A4, AD1 ... AD4, AD7 ... AD10  
Not with alternative mounting position KD.  
Not with rotary knob alternative DM1, DM2  
In combination with flow direction Z only with pressure output BC, BD, BE

**9 LD, DM1, DM2**

Not with integrated lock E11

**10 DM1, DM2**

Can only be selected in combination with pressure gauge alternative VS, A4, AD1 ... AD4, AD7 ... AD10

**11 KD**

Not with alternative pressure gauge scale MPA.  
In combination with alternative pressure gauge scale PSI only with flow direction Z and/or only with pressure output BC, BD, BE  
Not with mounting type WP, WPB.  
In combination with mounting type WR, WPM, WB, WBM not with flow direction Z.  
Not with pressure gauge alternative RG.  
In combination with pressure gauge alternatives A8, A4, AD1, AD2, AD3, AD4 only with flow direction Z.

**12 WR, WPM, WB, WBM**

In combination with flow direction Z not with alternative mounting position KD

**13 WR**

Only with flow direction Z.  
Not with rotary knob alternative LD

**14 WP, WPM, WPB**

Only with connecting plate AGA, AGB, AGC, AGD, AGE

**15 WP**

Only with flow direction Z and/or only with pressure output BC, BD, BE

**16 WPB**

Not with flow direction Z.  
Not with pressure output BC, BD, BE

**M** Mandatory data

**O** Options

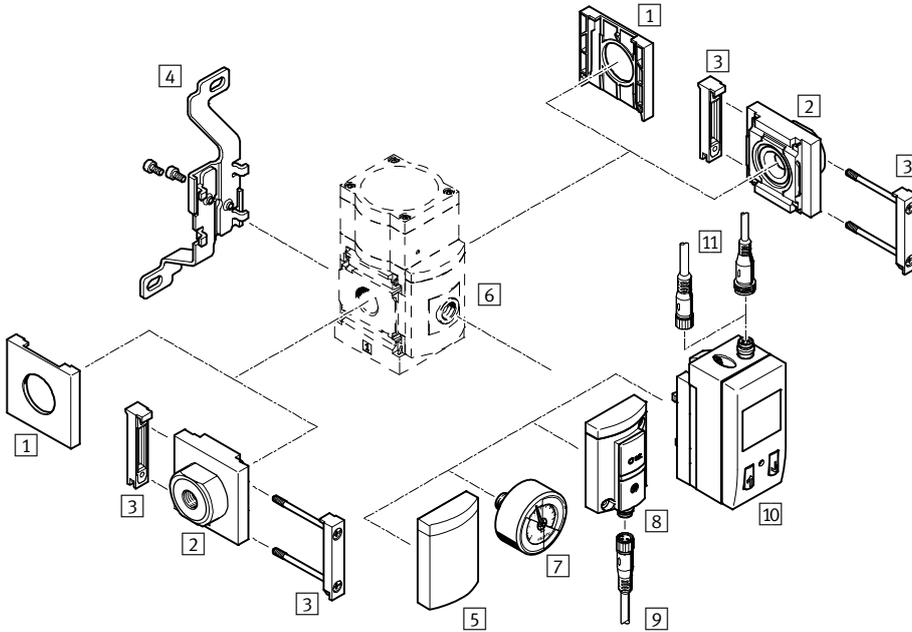
**Transfer order code**

- [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

# Precision pressure regulators MS6-LRP, MS series

Peripherals overview

## Precision pressure regulator MS6-LRP



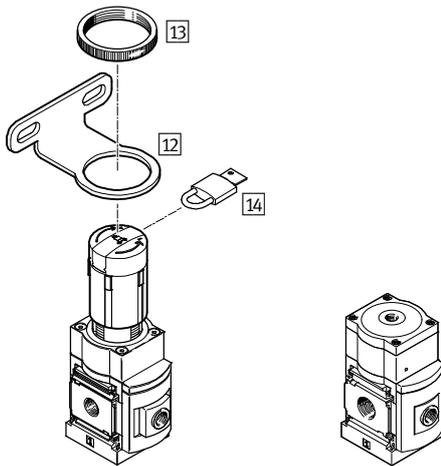
Note

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 → Internet: amv, rmv, armv
- Adapter plate for mounting on profiles → Internet: ipm-80, ipm-40-80, ipm-80-80

Manually operated

Pneumatically actuated



# Precision pressure regulators MS6-LRP, MS series

Peripherals overview

Mounting attachments and accessories						
		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS6-END	■	-	■	-	ms6-end
2	Connecting plate-SET MS6-AG...	-	■	-	■	ms6-ag
	Connecting plate-SET MS6-AQ...	-	■	-	■	ms6-aq
3	Module connector MS6-MV	-	■	■	■	ms6-mv
4	Mounting bracket MS6-WB	■	■	-	-	ms6-wb
5	Cover plate VS	■	■	■	■	48
6	Adapter plate for EN pressure gauge 1/8/1/4 A8/A4	■	■	■	■	48
7	Precision pressure gauge A8M/MAP	■	■	■	■	48, 95
8	Pressure sensor without display AD7 ... AD10	■	■	■	■	48
9	Connecting cable NEBU-M8...-LE3	■	■	■	■	95
10	Pressure sensor with display AD1 ... AD4	■	■	■	■	48
11	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■	■	■	■	95
12	Mounting bracket MS6-WR	■	■	-	-	ms6-wr
13	Knurled nut (included in scope of delivery) MS-LR	■	■	-	-	-
14	Padlock LRVS-D	■	■	■	■	95
-	Mounting bracket MS6-WP/WPB/WPE/WPM	-	■	■	■	ms6-wp

# Precision pressure regulators MS6-LRP, MS series

Type codes

MS 6 - LRP - 1/2 - D7 - A8

Series	
MS	Standard service unit
Size	
6	Grid dimension 62 mm
Service function	
LRP	Precision pressure regulator
Connection size	
1/4	G1/4 thread
3/8	G3/8 thread
1/2	G1/2 thread
Pressure regulation range/operation	
D2	0.05 ... 0.7 bar, manually operated
D4	0.05 ... 2.5 bar, manually operated
D5	0.1 ... 4 bar, manually operated
D7	0.1 ... 12 bar, manually operated
Pressure gauge alternatives	
A8	Adapter plate for EN pressure gauge 1/8, without pressure gauge

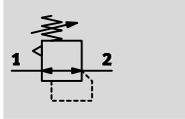
## Further variants can be ordered using the modular system → 48

- Connecting plates
- Pressure regulation range/operation
- Pressure gauge alternatives
- Rotary knob alternatives
- Alternative mounting position
- Security
- Type of mounting
- EU certification
- UL certification
- Flow direction

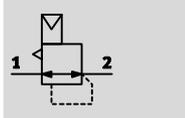
# Precision pressure regulators MS6-LRP, MS series

Technical data

Pressure regulation range/operation manually operated D2/D4/D5/D7



pneumatically actuated PO



- - Flow rate  
800 ... 5,000 l/min
- - Temperature range  
-10 ... +60 °C
- - Operating pressure  
1 ... 14 bar
- - [www.festo.com](http://www.festo.com)



The precision pressure regulator is suitable for sensitive applications with a required hysteresis of 0.02 bar. The output pressure p2 can be set within the pressure regulation range either manually using the rotary knob or pneumatically via a pilot pressure p12

by an external pilot regulator (if possible using a precision pressure regulator). When switching off the input pressure p1, the output pressure p2 is vented via the connection 3 (secondary venting).

- Good regulation characteristics with low hysteresis and primary pressure compensation
- High flow rate with minimal pressure drop
- High secondary venting for fast response times
- Regulator lock for protecting the values against adjustment
- Four pressure regulation ranges: 0.05 ... 0.7 bar, 0.05 ... 2.5 bar, 0.1 ... 4 bar and 0.1 ... 12 bar
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		MS6
Size		MS6
Pneumatic connection 1, 2	Female thread	G $\frac{1}{4}$ , G $\frac{3}{8}$ or G $\frac{1}{2}$
	Connecting plate AG...	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ or G $\frac{3}{4}$
	Connecting plate AQ...	NPT $\frac{1}{4}$ , NPT $\frac{3}{8}$ , NPT $\frac{1}{2}$ or NPT $\frac{3}{4}$
Pneumatic connection 3 (secondary venting)		G $\frac{1}{4}$
Pilot air connection 12 with variant PO		G $\frac{1}{8}$
Constructional design		Piloted precision diaphragm regulator
Regulating function		Output pressure constant, via secondary venting
Type of mounting		Via accessories
		In-line installation
		Front panel mounting
Mounting position		Any
Regulator lock		Rotary knob with detent
		Rotary knob with detent, lockable via accessories
		Rotary knob with integrated lock
Pressure regulation range/operation <sup>1)</sup>	D2 [bar]	0.05 ... 0.7, manually operated
	D4 [bar]	0.05 ... 2.5, manually operated
	D5 [bar]	0.1 ... 4, manually operated
	D7 [bar]	0.1 ... 12, manually operated (0.1 ... 10 with pressure sensor AD... or with UL certification)
	PO [bar]	0.1 ... 12, pneumatically actuated (0.1 ... 10 with pressure sensor AD... or with UL certification)
Max. hysteresis	[bar]	0.02
Pressure indication		Via pressure sensor for displaying output pressure via LCD display and electrical output
		Via pressure sensor for displaying output pressure via operational status indicator and electrical output
		Via precision pressure gauge for displaying output pressure
		G $\frac{1}{8}$ prepared
		G $\frac{1}{4}$ prepared

1) Variant D2/D4/D5/D7: Supply pressure p1 ≥ output pressure p2 + 1 bar. Variant PO: Output pressure p2 = pilot pressure p12 + max. 0.5 bar.  
 - - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRP, MS series

FESTO

Technical data

Flow rates				
Pressure regulation range	D2 (0.05 ... 0.7 bar)	D4 (0.05 ... 2.5 bar)	D5 (0.1 ... 4 bar)	D7/PO (0.1 ... 12 bar)
Standard nominal flow rate $q_{nN}$ [l/min]				
$q_{nN} 1 \rightarrow 2$	G $\frac{1}{4}$	800 <sup>1)</sup>	1,100 <sup>2)</sup>	1,400 <sup>3)</sup>
	G $\frac{3}{8}$	1,100 <sup>1)</sup>	1,400 <sup>2)</sup>	1,700 <sup>3)</sup>
	G $\frac{1}{2}$	1,600 <sup>1)</sup>	2,300 <sup>2)</sup>	3,000 <sup>3)</sup>
Secondary venting flow rate [l/min]				
$q_n 2 \rightarrow 3$	$\geq 220$ <sup>5)</sup>	$\geq 450$ <sup>6)</sup>	$\geq 650$ <sup>7)</sup>	$\geq 900$ <sup>8)</sup>

- 1) Measured at  $p_1 = 10$  bar and  $p_2 = 0.5$  bar,  $\Delta p = 0.1$  bar  
 2) Measured at  $p_1 = 10$  bar and  $p_2 = 1.5$  bar,  $\Delta p = 0.1$  bar  
 3) Measured at  $p_1 = 10$  bar and  $p_2 = 2.5$  bar,  $\Delta p = 0.1$  bar  
 4) Measured at  $p_1 = 10$  bar and  $p_2 = 6.0$  bar,  $\Delta p = 0.1$  bar

- 5) Measured at  $p_1 = 10$  bar and  $p_2 = 0.7$  bar,  $\Delta p_2 = 0.1$  bar  
 6) Measured at  $p_1 = 10$  bar and  $p_2 = 2.5$  bar,  $\Delta p_2 = 0.1$  bar  
 7) Measured at  $p_1 = 10$  bar and  $p_2 = 4.0$  bar,  $\Delta p_2 = 0.1$  bar  
 8) Measured at  $p_1 = 10$  bar and  $p_2 = 6.0$  bar,  $\Delta p_2 = 0.1$  bar

Operating and environmental conditions	
Operating pressure [bar]	1 ... 14 (1 ... 10) <sup>1)</sup>
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4] Inert gases
Note on operating/pilot medium	Operation with lubricated medium not possible
Ambient temperature [°C]	-10 ... +60 (0 ... +50) <sup>2)</sup>
Temperature of medium [°C]	-10 ... +60 (0 ... +50) <sup>2)</sup>
Storage temperature [°C]	-10 ... +60
Corrosion resistance class CRC <sup>3)</sup>	2
UL certification	cULus recognized (OL)

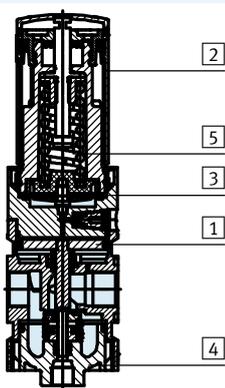
- 1) Value in brackets applies to MS6-LRP with UL certification.  
 2) Value in brackets applies to MS6-LRP with pressure sensor AD...  
 3) Corrosion resistance class CRC 2 to Festo standard FN 940070  
 Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	c T6 X
ATEX category dust	II 2D
EX-ignition protection type dust	c 60 °C X
ATEX ambient temperature	-10 °C $\leq$ Ta $\leq$ +60 °C
CE mark (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

Weight [g]	
Precision pressure regulator	1,000
Precision pressure regulator with rotary knob with integrated lock E11	1,120

## Materials

Sectional view



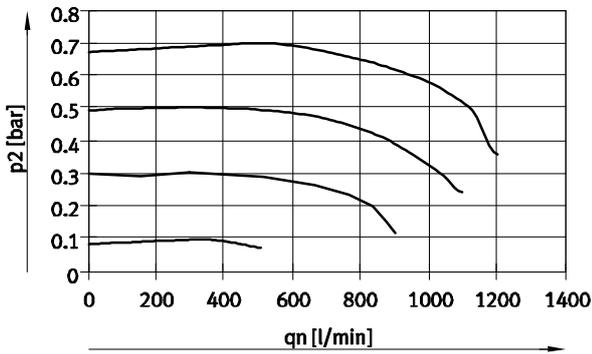
Precision pressure regulator		
1	Housing	Die-cast aluminium
2	Rotary knob	PA/POM
	Rotary knob with integrated lock E11	Aluminium
3	Diaphragm	NBR
4	Cap, bottom	PC
5	Springs	Steel
-	Seals	NBR
Note on materials		RoHS-compliant Free of copper and PTFE (not with variant A8M or AD...)

# Precision pressure regulators MS6-LRP, MS series

Technical data

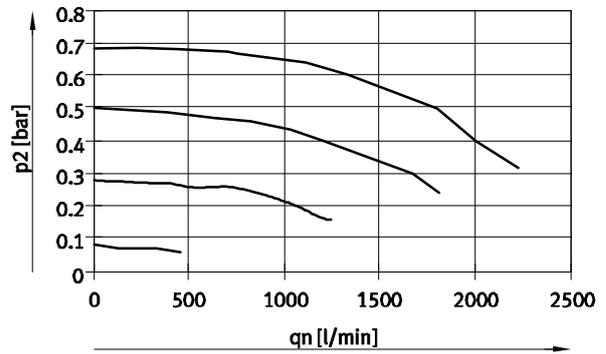
## Standard flow rate $q_n$ as a function of output pressure $p_2$ ( $p_1 = 10$ bar)

MS6-LRP-1/4-D2



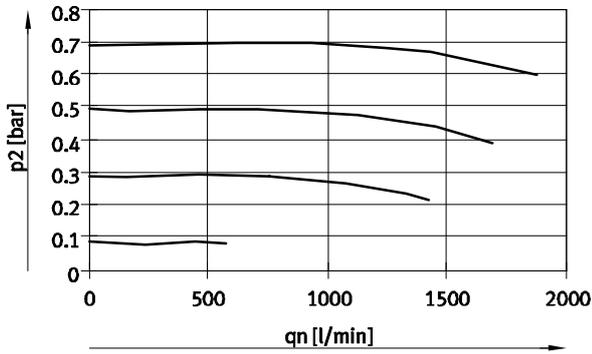
— D2: 0.05...0.7 bar

MS6-LRP-3/8-D2



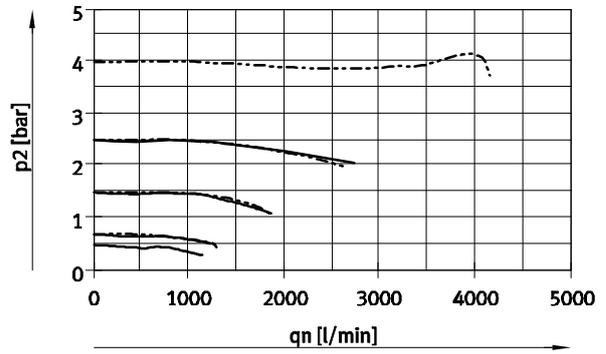
— D2: 0.05...0.7 bar

MS6-LRP-1/2-D2



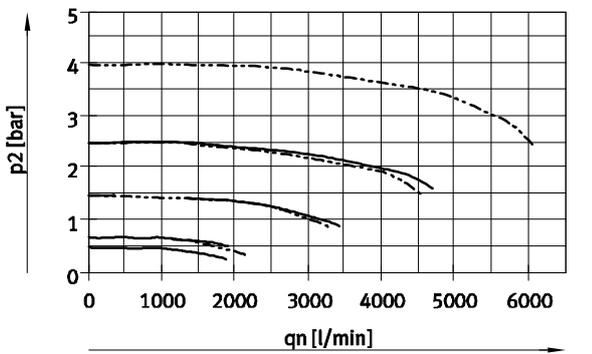
— D2: 0.05...0.7 bar

MS6-LRP-1/4-D4/D5



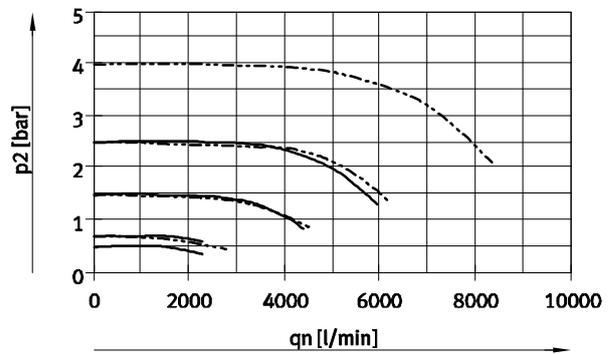
— D4: 0.05...2.5 bar  
- - - D5: 0.1...4 bar

MS6-LRP-3/8-D4/D5



— D4: 0.05...2.5 bar  
- - - D5: 0.1...4 bar

MS6-LRP-1/2-D4/D5



— D4: 0.05...2.5 bar  
- - - D5: 0.1...4 bar

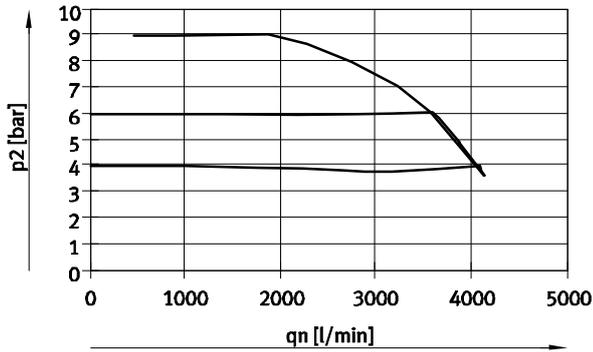
# Precision pressure regulators MS6-LRP, MS series

Technical data

FESTO

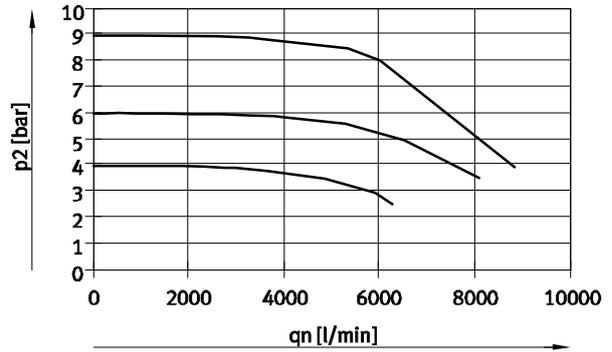
## Standard flow rate $q_n$ as a function of output pressure $p_2$ ( $p_1 = 10$ bar)

MS6-LRP- $\frac{1}{4}$ -D7/PO



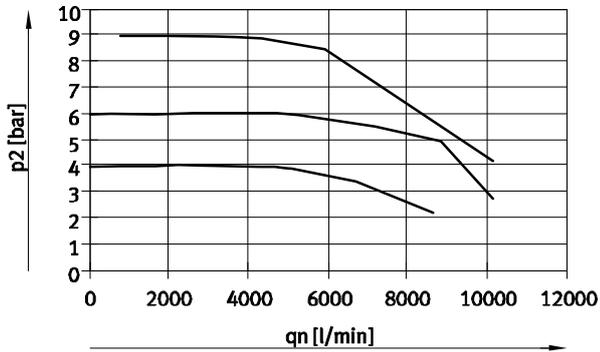
— D7/PO: 0.1...12 bar

MS6-LRP- $\frac{3}{8}$ -D7/PO



— D7/PO: 0.1...12 bar

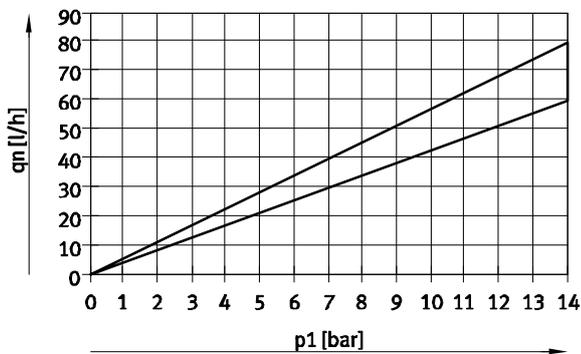
MS6-LRP- $\frac{1}{2}$ -D7/PO



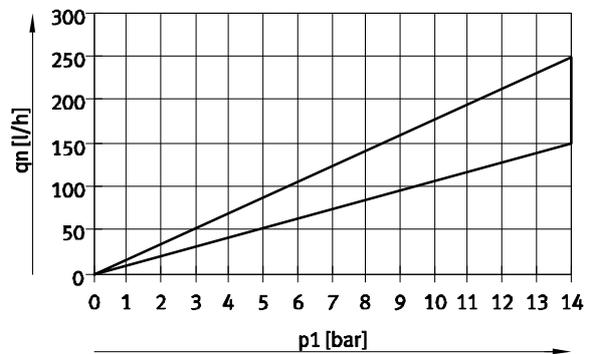
— D7/PO: 0.1...12 bar

## Internal air consumption $q_n$ as a function of input pressure $p_1$

MS6-LRP-...-D2/D4



MS6-LRP-...-D5/D7/PO



# Precision pressure regulators MS6-LRP, MS series

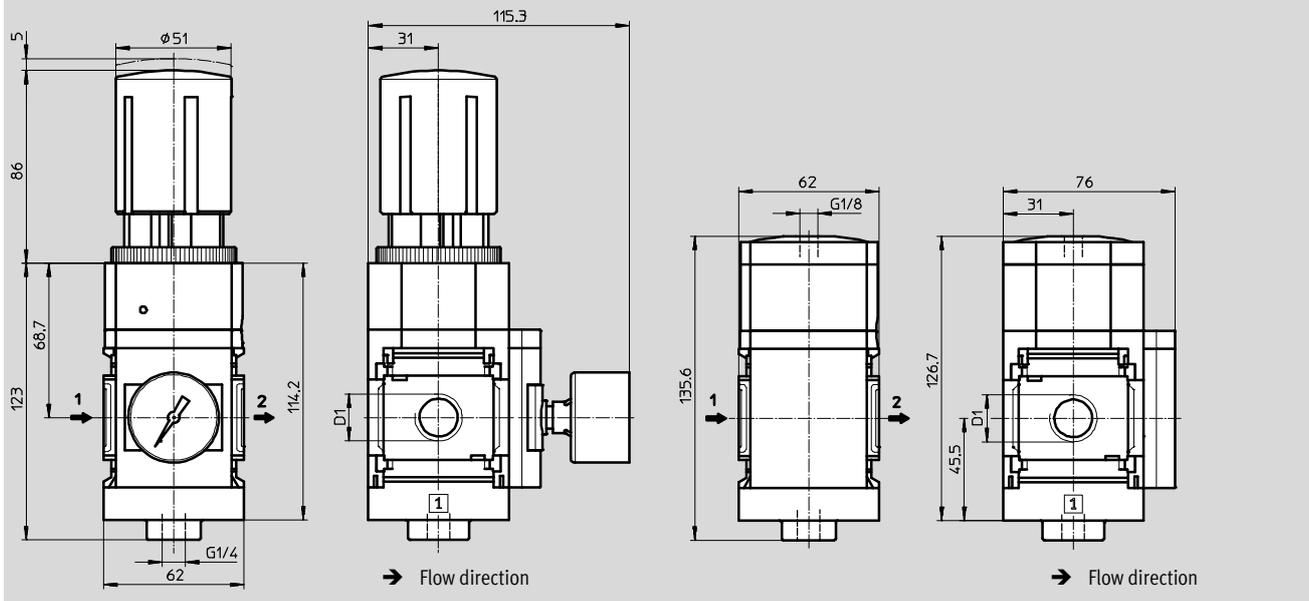
Technical data

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

manually operated D2/D4/D5/D7,  
with adapter plate A8M for EN pressure gauge 1/8 as pressure gauge alternative  
with precision pressure gauge MAP

pneumatically actuated PO,  
with cover plate VS as pressure gauge alternative



Type	D1
MS6-LRP-1/4-D2/D4/D5/D7-A8M	G1/4
MS6-LRP-3/8-D2/D4/D5/D7-A8M	G3/8
MS6-LRP-1/2-D2/D4/D5/D7-A8M	G1/2

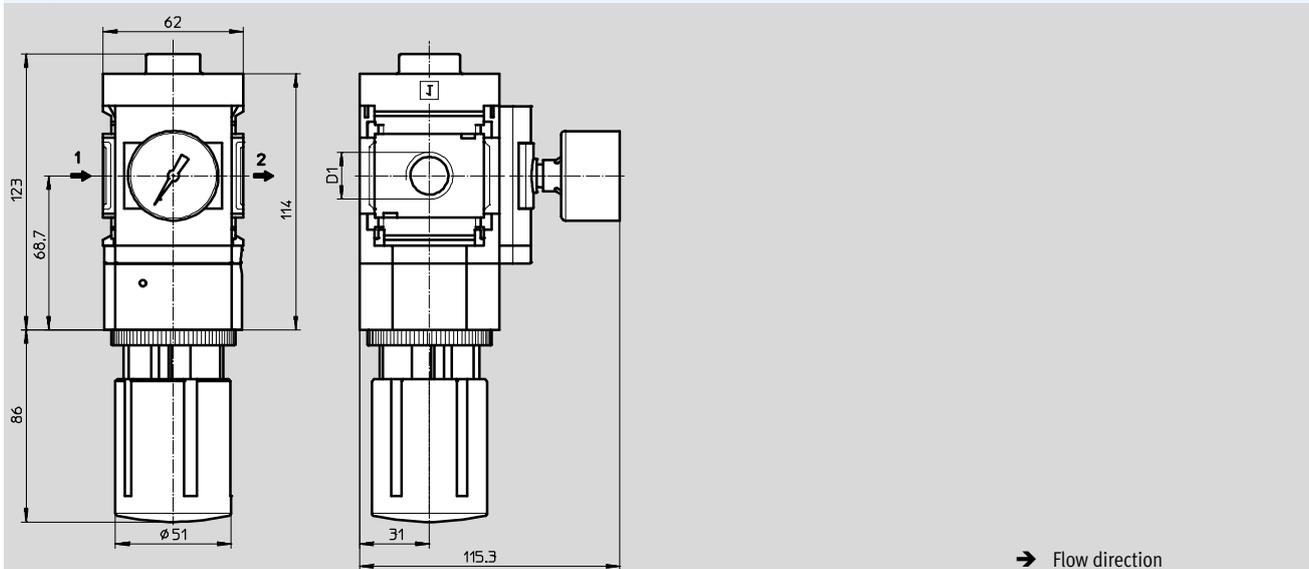
Type	D1
MS6-LRP-1/4-PO-VS	G1/4
MS6-LRP-3/8-PO-VS	G3/8
MS6-LRP-1/2-PO-VS	G1/2

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

## Dimensions – Alternative mounting position

Download CAD data → [www.festo.com](http://www.festo.com)

Rotary knob at bottom KD



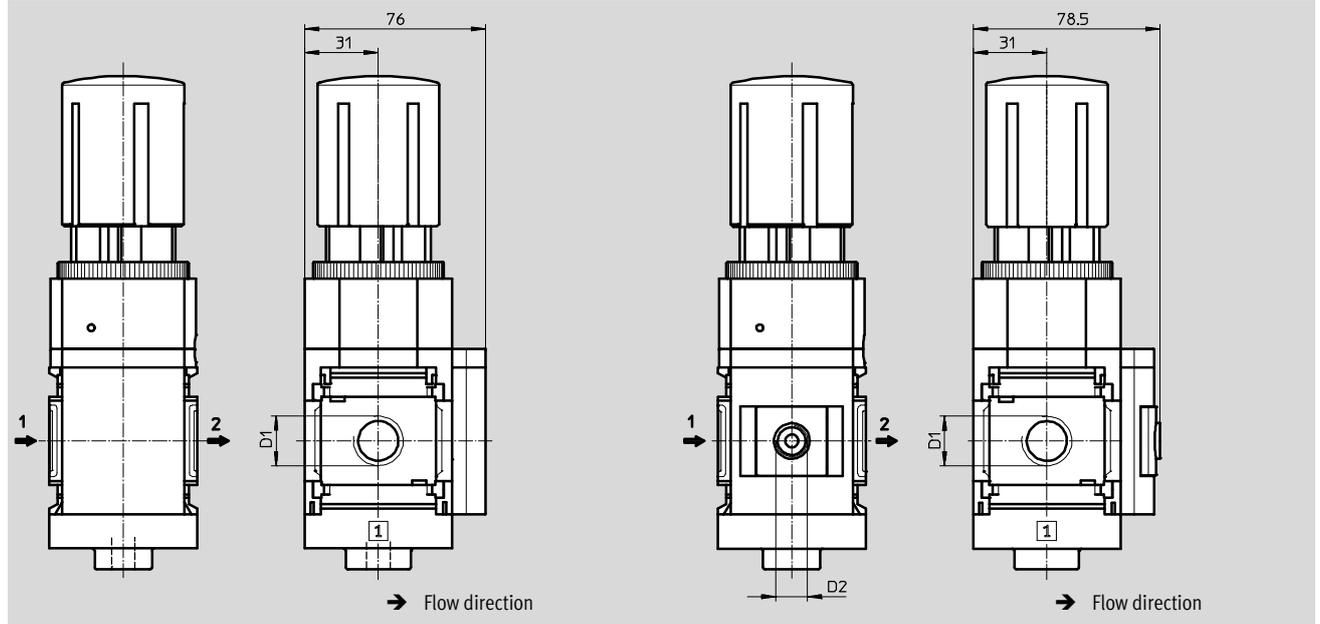
Type	D1
MS6-LRP-1/4-...-KD	G1/4
MS6-LRP-3/8-...-KD	G3/8
MS6-LRP-1/2-...-KD	G1/2

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRP, MS series

Technical data

Dimensions – Pressure gauge alternatives Download CAD data → [www.festo.com](http://www.festo.com)  
 Cover plate VS Adapter plate A8/A4 for EN pressure gauge 1/8/1/4, without pressure gauge



Type	D1	D2
MS6-LRP-1/4-...-VS	G1/4	-
MS6-LRP-3/8-...-VS	G3/8	
MS6-LRP-1/2-...-VS	G1/2	
MS6-LRP-1/4-...-A8	G1/4	G1/8
MS6-LRP-3/8-...-A8	G3/8	
MS6-LRP-1/2-...-A8	G1/2	
MS6-LRP-1/4-...-A4	G1/4	G1/4
MS6-LRP-3/8-...-A4	G3/8	
MS6-LRP-1/2-...-A4	G1/2	

• | • Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRP, MS series

Technical data

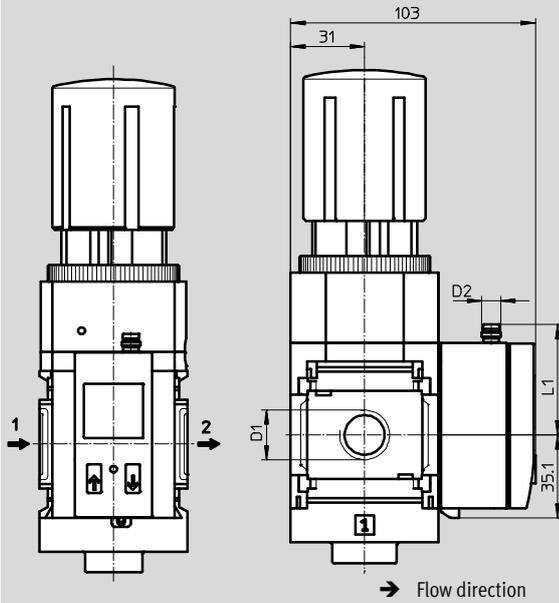
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## Dimensions – Pressure gauge alternatives

Pressure sensor with LCD display AD1 ... AD4

Download CAD data → [www.festo.com](http://www.festo.com)

Technical data → Internet: [sde1](#)



Variant AD1:  
SDE1-D10-G2-MS-L-P1-M8 with  
3-pin plug M8x1, 1 switching  
output PNP

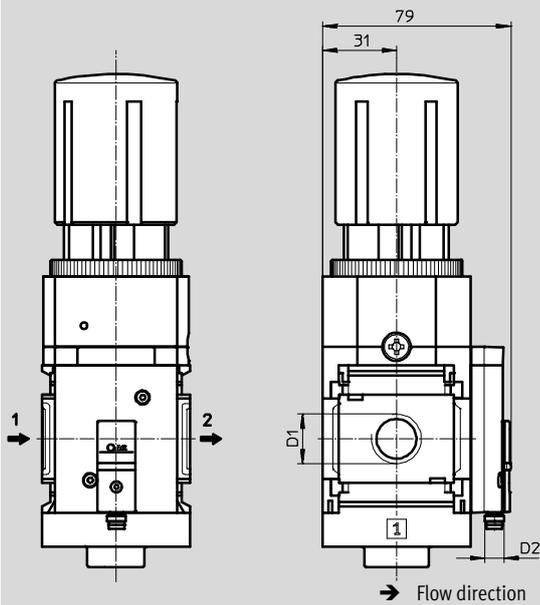
Variant AD2:  
SDE1-D10-G2-MS-L-N1-M8 with  
3-pin plug M8x1, 1 switching  
output NPN

Variant AD3:  
SDE1-D10-G2-MS-L-PI-M12 with  
4-pin plug M12x1, 1 switching out-  
put PNP and 4 ... 20 mA analogue

Variant AD4:  
SDE1-D10-G2-MS-L-NI-M12 with  
4-pin plug M12x1, 1 switching out-  
put NPN and 4 ... 20 mA analogue

Pressure sensor without LCD display (operational status indicator only) AD7 ... AD10

Technical data → Internet: [sde5](#)



Variant AD7:  
SDE5-D10-O-...-P-M8 with 3-pin  
plug M8x1, threshold value  
comparator, 1 switching output PNP,  
N/O contact

Variant AD8:  
SDE5-D10-C-...-P-M8 with 3-pin  
plug M8x1, threshold value  
comparator, 1 switching output PNP,  
N/C contact

Variant AD9:  
SDE5-D10-O3-...-P-M8 with 3-pin  
plug M8x1, window comparator,  
1 switching output PNP, N/O contact

Variant AD10:  
SDE5-D10-C3-...-P-M8 with 3-pin  
plug M8x1, window comparator,  
1 switching output PNP, N/C contact

Type	D1	D2	L1
MS6-LRP-1/4-...-AD1/AD2	G1/4	M8x1	46.7
MS6-LRP-3/8-...-AD1/AD2	G3/8		
MS6-LRP-1/2-...-AD1/AD2	G1/2		
MS6-LRP-1/4-...-AD3/AD4	G1/4	M12x1	55.8
MS6-LRP-3/8-...-AD3/AD4	G3/8		
MS6-LRP-1/2-...-AD3/AD4	G1/2		
MS6-LRP-1/4-...-AD7/AD8/AD9/AD10	G1/4	M8x1	-
MS6-LRP-3/8-...-AD7/AD8/AD9/AD10	G3/8		
MS6-LRP-1/2-...-AD7/AD8/AD9/AD10	G1/2		

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRP, MS series

Technical data

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## Dimensions – Rotary knob

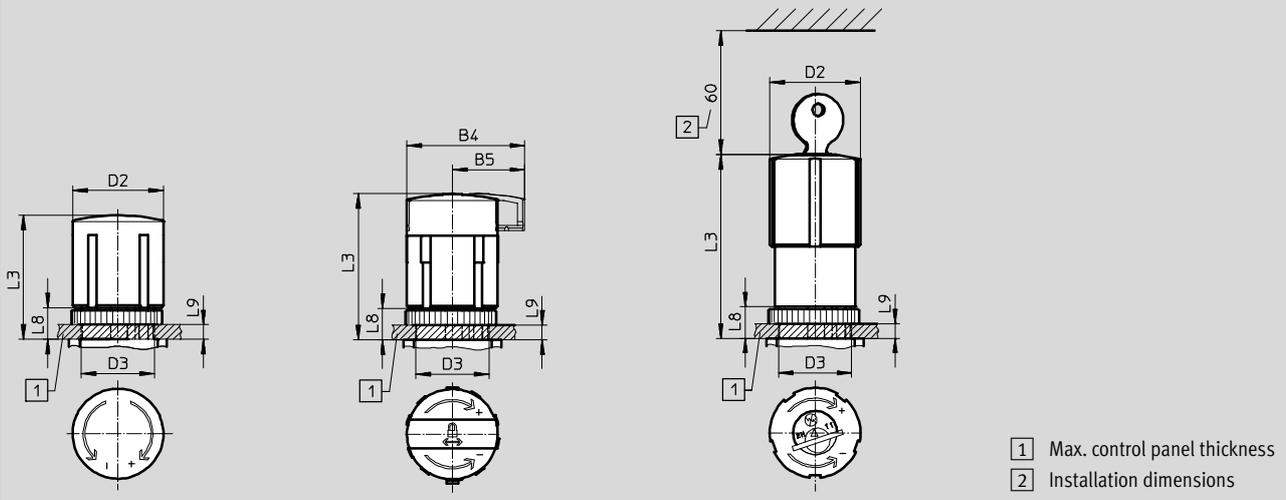
Download CAD data → [www.festo.com](http://www.festo.com)

For installation into control panel

Standard rotary knob with detent

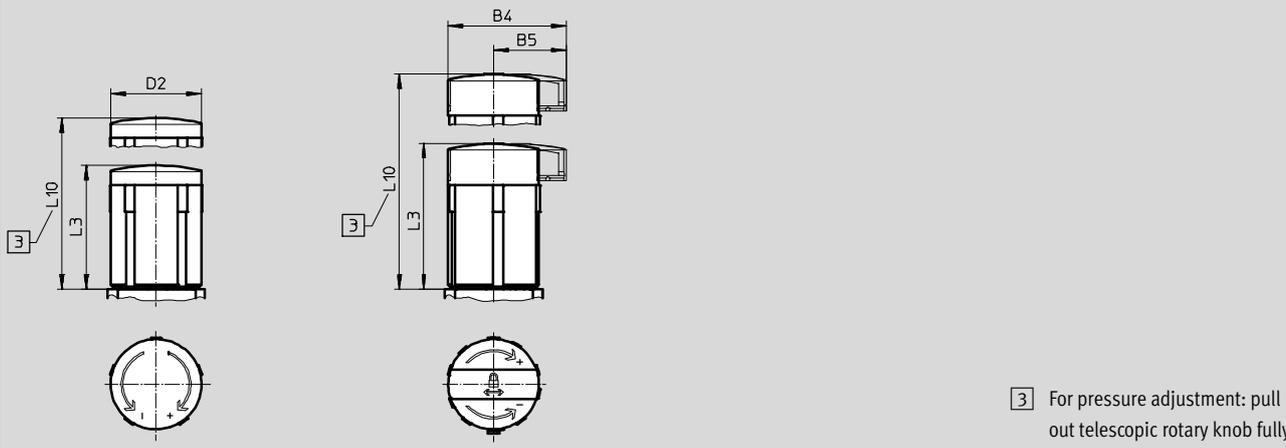
Standard rotary knob with detent,  
lockable via accessories AS

Rotary knob with integrated lock  
E11



Long rotary knob with detent LD

Long rotary knob with detent,  
lockable via accessories LD-AS



Type	B4	B5	D2	D3 +1	L3	L8	L9	L10
MS6-LRP-...	-	-	51.2	44	86	22	14	-
MS6-LRP-...-AS	64.4	38.8			93			
MS6-LRP-...-E11	-	-	51.8	-	110	-	-	-
MS6-LRP-...-LD	-	-	51.2	-	86	-	-	139
MS6-LRP-...-LD-AS	64.4	38.8			95.5			148.5

# Precision pressure regulators MS6-LRP, MS series

Technical data

Ordering data			
Adapter plate for EN pressure gauge 1/8, standard rotary knob with detent			
Size	Connection	Part No.	Type
Pressure regulation range 0.05 ... 0.7 bar, manually operated			
MS6	G1/4	<b>538004</b>	<b>MS6-LRP-1/4-D2-A8<sup>1)</sup></b>
	G3/8	<b>538012</b>	<b>MS6-LRP-3/8-D2-A8<sup>1)</sup></b>
	G1/2	<b>538020</b>	<b>MS6-LRP-1/2-D2-A8<sup>1)</sup></b>
Pressure regulation range 0.05 ... 2.5 bar, manually operated			
MS6	G1/4	<b>538006</b>	<b>MS6-LRP-1/4-D4-A8<sup>1)</sup></b>
	G3/8	<b>538014</b>	<b>MS6-LRP-3/8-D4-A8<sup>1)</sup></b>
	G1/2	<b>538022</b>	<b>MS6-LRP-1/2-D4-A8<sup>1)</sup></b>
Pressure regulation range 0.1 ... 4 bar, manually operated			
MS6	G1/4	<b>538008</b>	<b>MS6-LRP-1/4-D5-A8<sup>1)</sup></b>
	G3/8	<b>538016</b>	<b>MS6-LRP-3/8-D5-A8<sup>1)</sup></b>
	G1/2	<b>538024</b>	<b>MS6-LRP-1/2-D5-A8<sup>1)</sup></b>
Pressure regulation range 0.1 ... 12 bar, manually operated			
MS6	G1/4	<b>538010</b>	<b>MS6-LRP-1/4-D7-A8<sup>1)</sup></b>
	G3/8	<b>538018</b>	<b>MS6-LRP-3/8-D7-A8<sup>1)</sup></b>
	G1/2	<b>538026</b>	<b>MS6-LRP-1/2-D7-A8<sup>1)</sup></b>

1) Free of copper and PTFE

# Precision pressure regulators MS6-LRP, MS series

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Ordering data – Modular products

Ordering table		Grid dimension [mm]	62	Condi- tions	Code	Enter code
<b>M</b>	Module No.	<b>538028</b>				
	Series	Standard			<b>MS</b>	MS
	Size	6			<b>6</b>	6
	Function	Precision pressure regulator			<b>-LRP</b>	-LRP
	Pneumatic connection	Female thread G $\frac{1}{4}$		<b>1</b>	- $\frac{1}{4}$	
		Female thread G $\frac{3}{8}$		<b>1</b>	- $\frac{3}{8}$	
		Female thread G $\frac{1}{2}$		<b>1</b>	- $\frac{1}{2}$	
		Connecting plate G $\frac{1}{4}$			<b>-AGB</b>	
		Connecting plate G $\frac{3}{8}$			<b>-AGC</b>	
		Connecting plate G $\frac{1}{2}$			<b>-AGD</b>	
		Connecting plate G $\frac{3}{4}$			<b>-AGE</b>	
		Connecting plate NPT $\frac{1}{4}$		<b>1</b>	<b>-AQN</b>	
		Connecting plate NPT $\frac{3}{8}$		<b>1</b>	<b>-AQP</b>	
		Connecting plate NPT $\frac{1}{2}$		<b>1</b>	<b>-AQR</b>	
		Connecting plate NPT $\frac{3}{4}$		<b>1</b>	<b>-AQS</b>	
		Pressure regulation range/ operation	0.05 ... 0.7 bar, manually operated			<b>-D2</b>
	0.05 ... 2.5 bar, manually operated				<b>-D4</b>	
	0.1 ... 4 bar, manually operated				<b>-D5</b>	
	0.1 ... 12 bar, manually operated				<b>-D7</b>	
	0.1 ... 12 bar, pneumatically actuated (pressure range determined by means of pilot regulator)			<b>1 2</b>	<b>-PO</b>	
	Pressure gauge alternatives	Cover plate			<b>-VS</b>	
		Adapter plate for EN pressure gauge $\frac{1}{8}$ , without pressure gauge			<b>-A8</b>	
		Adapter plate for EN pressure gauge $\frac{1}{8}$ , with precision pressure gauge			<b>-A8M</b>	
		Adapter plate for EN pressure gauge $\frac{1}{4}$ , without pressure gauge			<b>-A4</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output PNP, 3-pin		<b>1 3</b>	<b>-AD1</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output NPN, 3-pin		<b>1 3</b>	<b>-AD2</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA		<b>1 3</b>	<b>-AD3</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA		<b>1 3</b>	<b>-AD4</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact		<b>1 4</b>	<b>-AD7</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact		<b>1 4</b>	<b>-AD8</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact		<b>1 4</b>	<b>-AD9</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact		<b>1 4</b>	<b>-AD10</b>	

**1**  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ , **AQN, AQP, AQR, AQS, PO, AD1 ... AD4, AD7 ... AD10, KD, E11, WPM**  
Not with EU certification EX4

**2** **PO** Not with rotary knob alternative LD  
Not with security AS, E11  
Not with mounting type WR

**M** Mandatory data  
**O** Options

Transfer order code

**538028** **MS** **6** - **LRP** -  -  -

# Precision pressure regulators MS6-LRP, MS series

Ordering data – Modular products

Ordering table					
Grid dimension	[mm]	62	Condi- tions	Code	Enter code
<input type="checkbox"/>	Rotary knob alternative	Long rotary knob	<input type="checkbox"/>	-LD	
	Alternative mounting position	Rotary knob underneath	<input type="checkbox"/>	-KD	
	Security	Lockable via accessories		-AS	
		With integrated lock	<input type="checkbox"/>	-E11	
	Type of mounting	Mounting bracket with knurled nut for regulator head	<input type="checkbox"/>	-WR	
		Mounting bracket standard design	<input type="checkbox"/>	-WP	
		Mounting bracket for attaching the service units	<input type="checkbox"/>	-WPM	
		Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required		-WB	
	EU certification	II 2GD to EU Directive 94/9/EG		-EX4	
	UL certification	cULus, ordinary location for Canada and USA		-UL1	
	Flow direction	Flow direction from right to left (without pressure output, no pressure gauge)		-Z	

- AD1 ... AD4** Measuring range max. 10 bar.  
Not with pressure regulation range/operation D2, D4
- AD7 ... AD10** Measuring range max. 10 bar.  
Not with pressure regulation range/operation D2
- LD** Not with integrated lock E11

- KD** Not with mounting type WP
- WR** Not with rotary knob alternative LD
- WP, WPM** Only with connecting plate AGB, AGC, AGD, AGE, AQN, AQP, AQR or AQS

- M** Mandatory data
- O** Options

**Transfer order code**

-  -  -  -  -  -  -



# Precision pressure regulators MS6-LRPB, MS series

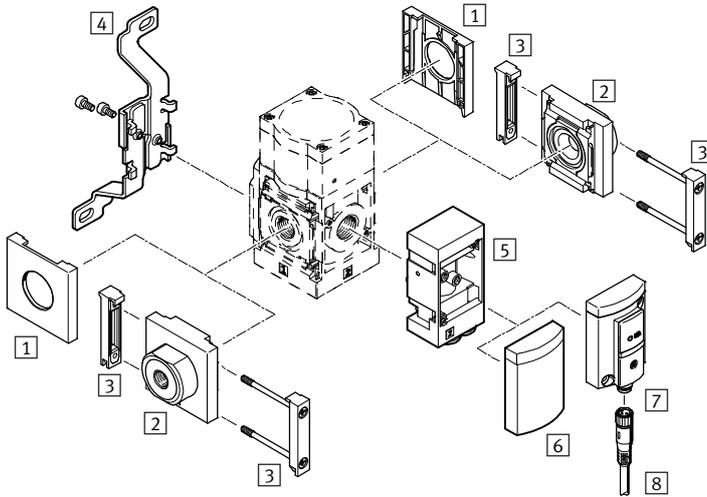
Peripherals overview

Mounting attachments and accessories						
		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS6-END	■	-	■	-	ms6-end
2	Connecting plate-SET MS6-AG...	-	■	-	■	ms6-ag
3	Module connector MS6-MV	-	■	■	■	ms6-mv
4	Angled outlet block B...	■	■	■	■	64
5	Adapter plate for EN pressure gauge 1/8/1/4 A8/A4	■	■	■	■	64
6	Cover plate VS	■	■	■	■	64
7	Precision pressure gauge A8M/MAP	■	■	■	■	64, 95
8	Pressure sensor without display AD7 ... AD10	■	■	■	■	64
9	Connecting cable NEBU-M8...-LE3	■	■	■	■	95
10	Pressure sensor with display AD1 ... AD4	■	■	■	■	64
11	Connecting cable NEBU-M8...-LE3/NEBU-M12...-LE4	■	■	■	■	95
12	Mounting bracket MS6-WP	-	■	■	■	ms6-wp
13	Mounting bracket MS6-WPB	-	■	■	■	ms6-wp
14	Mounting bracket MS6-WPE	-	■	■	■	ms6-wp
15	Mounting bracket MS6-WPM	-	■	■	■	ms6-wp
16	Padlock LRVS-D	■	■	■	■	95

# Precision pressure regulators MS6-LRPB, MS series

Peripherals overview

## Precision pressure regulator MS6-LRPB with pressure output to the front



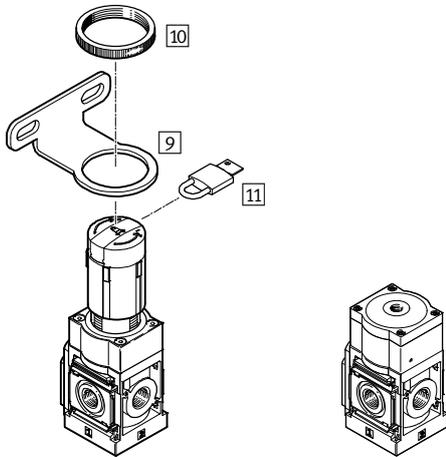
-  - Note

Additional accessories:

- Module connector for combination with size MS4/MS6 or size MS9 → Internet: amv, rmv, armv
- Adapter plate for mounting on profiles → Internet: ipm-80, ipm-40-80, ipm-80-80

### Manually operated

### Pneumatically actuated



# Precision pressure regulators MS6-LRPB, MS series

Peripherals overview

Mounting attachments and accessories						
		Individual device		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS6-END	■	-	■	-	ms6-end
2	Connecting plate-SET MS6-AG...	-	■	-	■	ms6-ag
3	Module connector MS6-MV	-	■	■	■	ms6-mv
4	Mounting bracket MS6-WB	■	■	-	-	ms6-wb
5	Angled outlet block B...	■	■	■	■	64
6	Cover plate VS	■	■	■	■	64
7	Pressure sensor without display AD7 ... AD10	■	■	■	■	64
8	Connecting cable NEBU-M8...-LE3	■	■	■	■	95
9	Mounting bracket MS6-WR	■	■	-	-	ms6-wr
10	Knurled nut (included in scope of delivery) MS-LR	■	■	-	-	-
11	Padlock LRVS-D	■	■	■	■	95

# Precision pressure regulators MS6-LRPB, MS series

Type codes

		MS	6	-	LRPB	-	1/2	-	D7	-	A8	-	BD
<b>Series</b>													
MS	Standard service unit												
<b>Size</b>													
6	Grid dimension 62 mm												
<b>Service function</b>													
LRPB	Precision pressure regulator for manifold assembly												
<b>Connection size</b>													
1/2	G1/2 thread												
<b>Pressure regulation range/operation</b>													
D2	0.05 ... 0.7 bar, manually operated												
D4	0.05 ... 2.5 bar, manually operated												
D5	0.1 ... 4 bar, manually operated												
D7	0.1 ... 12 bar, manually operated												
<b>Pressure gauge alternatives</b>													
A8	Adapter plate for EN pressure gauge 1/8, without pressure gauge												
<b>Pressure output</b>													
	Without angled outlet block												
BD	Angled outlet block QS-8												

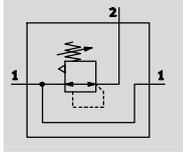
**Further variants can be ordered using the modular system → 64**

- Connecting plates
- Pressure regulation range/operation
- Pressure gauge alternatives
- Rotary knob alternatives
- Alternative mounting position
- Security
- Alternative pressure output
- Type of mounting
- EU certification
- UL certification
- Flow direction

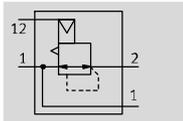
# Precision pressure regulators MS6-LRPB, MS series

Technical data

Pressure regulation range/operation manually operated D2/D4/D5/D7



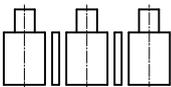
pneumatically actuated PO



- - Flow rate  
1,600 ... 5,000 l/min
- - Temperature range  
-10 ... +60 °C
- - Operating pressure  
1 ... 14 bar
- - [www.festo.com](http://www.festo.com)



Precision pressure regulator for manifold assembly:



The precision pressure regulator is suitable for sensitive applications requiring a hysteresis of 0.02 bar. The output pressure p2 can be set within

the pressure regulation range either manually using the rotary knob or pneumatically via a pilot pressure p12 by an external pilot regulator (if possible using a precision pressure regulator). When switching off the input pressure p1, the output pressure p2 is vented via connection 3 (secondary venting).

- Good regulation characteristics with low hysteresis and primary pressure compensation
- Manifold assembly with through air supply
- For configuring a regulator manifold with independent pressure regulation ranges
- Regulator lock for protecting the values against adjustment
- Four pressure regulation ranges: 0.05 ... 0.7 bar, 0.05 ... 2.5 bar, 0.1 ... 4 bar and 0.1 ... 12 bar
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		MS6
Size		MS6
Pneumatic connection 1	Female thread	G $\frac{1}{2}$
	Connecting plate AG...	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ or G $\frac{3}{4}$
Pneumatic connection 2		G $\frac{1}{2}$
		QS-8 with angled outlet block BD
		QS-10 with angled outlet block BE
Pneumatic connection 3		G $\frac{1}{4}$
Pilot air connection 12 with variant PO		G $\frac{1}{8}$
Constructional design		Piloted precision diaphragm regulator with through pressure supply
Regulating function		Output pressure constant, via secondary venting
Type of mounting		Via accessories
		In-line installation
		Front panel mounting
Mounting position		Any
Regulator lock		Rotary knob with detent
		Rotary knob with detent, lockable via accessories
		Rotary knob with integrated lock
Pressure regulation range/operation <sup>1)</sup>	D2 [bar]	0.05 ... 0.7, manually operated
	D4 [bar]	0.05 ... 2.5, manually operated
	D5 [bar]	0.1 ... 4, manually operated
	D7 [bar]	0.1 ... 12, manually operated (0.1 ... 10 with pressure sensor AD... or with UL certification)
	PO [bar]	0.1 ... 12, pneumatically actuated (0.1 ... 10 with pressure sensor AD... or with UL certification)
Max. hysteresis	[bar]	0.02

1) Variant D2/D4/D5/D7: Supply pressure p1  $\geq$  output pressure p2 + 1 bar. Variant PO: Output pressure p2 = pilot pressure p12 + max. 0.5 bar.  
 - - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRPB, MS series

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Technical data

General technical data	
Size	MS6
Pressure indication	Via pressure sensor for displaying output pressure via LCD display and electrical output
	Via pressure sensor for displaying output pressure via operational status indicator and electrical output
	Via pressure gauge for displaying output pressure
	G $\frac{1}{8}$ prepared
	G $\frac{1}{4}$ prepared

Flow rates				
Pressure regulation range	D2 (0.05 ... 0.7 bar)	D4 (0.05 ... 2.5 bar)	D5 (0.1 ... 4 bar)	D7/PO (0.1 ... 12 bar)
Standard nominal flow rate q <sub>nN</sub> [l/min]				
q <sub>nN</sub> 1 → 2	G $\frac{1}{2}$	1,600 <sup>1)</sup>	2,300 <sup>2)</sup>	3,000 <sup>3)</sup>
Secondary venting flow rate [l/min]				
q <sub>n</sub> 2 → 3	≥ 220 <sup>5)</sup>	≥ 450 <sup>6)</sup>	≥ 650 <sup>7)</sup>	≥ 900 <sup>8)</sup>

1) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 0.5 bar, Δp = 0.1 bar

2) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 1.5 bar, Δp = 0.1 bar

3) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 2.5 bar, Δp = 0.1 bar

4) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 6.0 bar, Δp = 0.1 bar

5) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 0.7 bar, Δp<sub>2</sub> = 0.1 bar

6) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 2.5 bar, Δp<sub>2</sub> = 0.1 bar

7) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 4.0 bar, Δp<sub>2</sub> = 0.1 bar

8) Measured at p<sub>1</sub> = 10 bar and p<sub>2</sub> = 6.0 bar, Δp<sub>2</sub> = 0.1 bar

Operating and environmental conditions	
Operating pressure [bar]	1 ... 14 (1 ... 10) <sup>1)</sup>
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
	Inert gases
Note on operating/pilot medium	Operation with lubricated medium not possible
Ambient temperature [°C]	-10 ... +60 (0 ... +50) <sup>2)</sup>
Temperature of medium [°C]	-10 ... +60 (0 ... +50) <sup>2)</sup>
Storage temperature [°C]	-10 ... +60
Corrosion resistance class CRC <sup>3)</sup>	2
UL certification	cULus recognized (OL)

1) Value in brackets applies to MS6-LRPB with UL certification.

2) Value in brackets applies to MS6-LRPB with pressure sensor AD...

3) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	c T6 X
ATEX category dust	II 2D
Ex-ignition protection type dust	c 60 °C X
ATEX ambient temperature	-10 °C ≤ T <sub>a</sub> ≤ +60 °C
CE mark (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

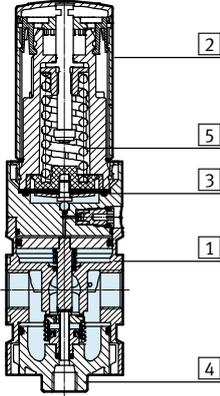
Weight [g]	
Precision pressure regulator	1,000
Precision pressure regulator with rotary knob with integrated lock E11	1,120

# Precision pressure regulators MS6-LRPB, MS series

Technical data

## Materials

Sectional view

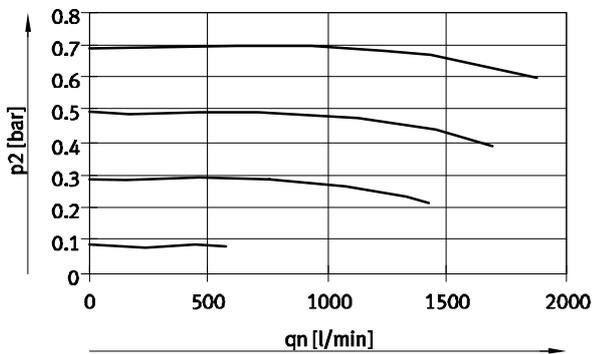


Precision pressure regulator (manifold assembly)

1	Housing	Die-cast aluminium
2	Rotary knob	PA/POM
	Rotary knob with integrated lock E11	Aluminium
3	Diaphragm	NBR
4	Cap, bottom	PC
5	Springs	Steel
-	Seals	NBR
Note on materials		RoHS-compliant
		Free of copper and PTFE (not with variant A8M or AD...)

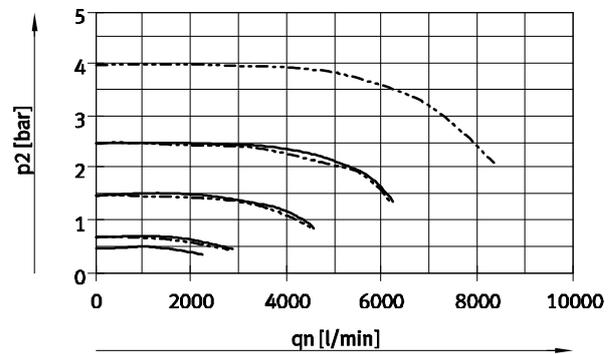
## Standard flow rate $q_n$ as a function of output pressure $p_2$ ( $p_1 = 10$ bar)

MS6-LRPB-1/2-D2



— D2: 0.05...0.7 bar

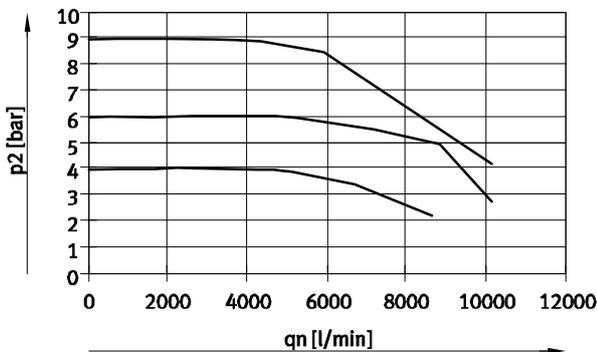
MS6-LRPB-1/2-D4/D5



— D4: 0.05...2.5 bar

- - - D5: 0.1...4 bar

MS6-LRPB-1/2-D7/PO



— D7/PO: 0.1...12 bar

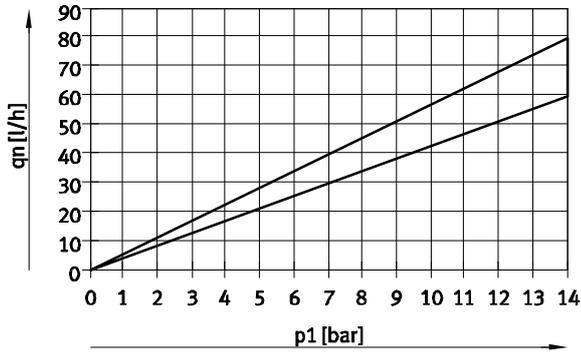
# Precision pressure regulators MS6-LRPB, MS series

Technical data

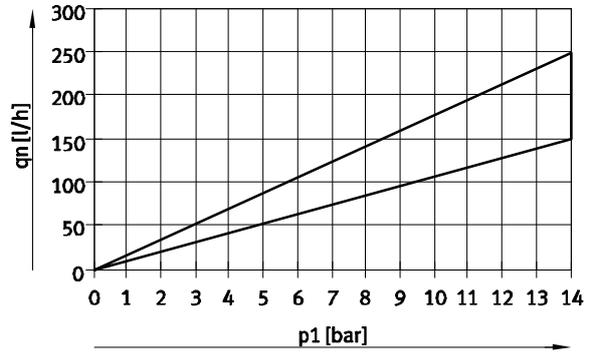
FESTO

## Internal air consumption $q_n$ as a function of input pressure $p_1$

MS6-LRPB-...-D2/D4



MS6-LRPB-...-D5/D7/PO

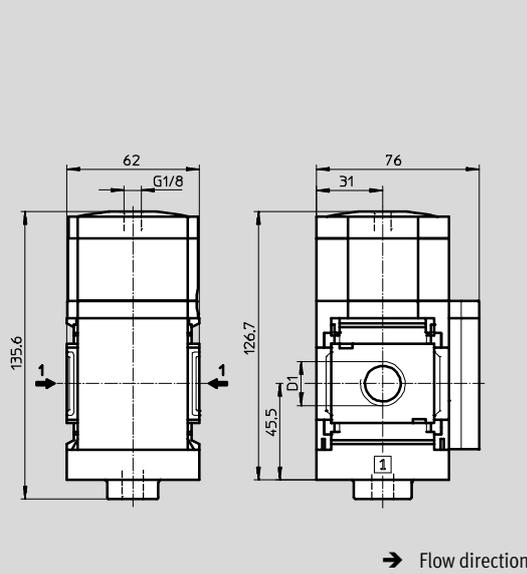
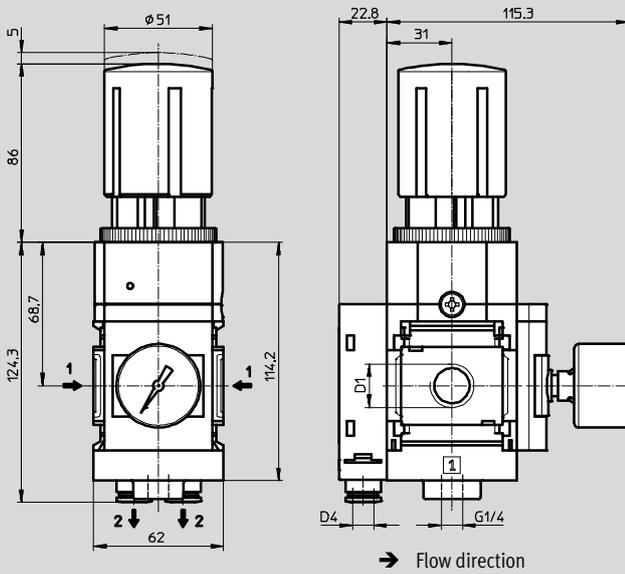


## Dimensions

manually operated D2/D4/D5/D7,  
with adapter plate A8M for EN pressure gauge  $\frac{1}{8}$  as pressure gauge alternative,  
with precision pressure gauge MAP, with angled outlet block BD/BE

Download CAD data → [www.festo.com](http://www.festo.com)

pneumatically actuated PO,  
with cover plate VS as pressure gauge alternative



Type	D1	D4
MS6-LRPB-1/2-D2/D4/D5/D7-A8M-BD	G1/2	QS-8
MS6-LRPB-1/2-D2/D4/D5/D7-A8M-BE		QS-10

Type	D1
MS6-LRPB-1/2-PO-VS	G1/2

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

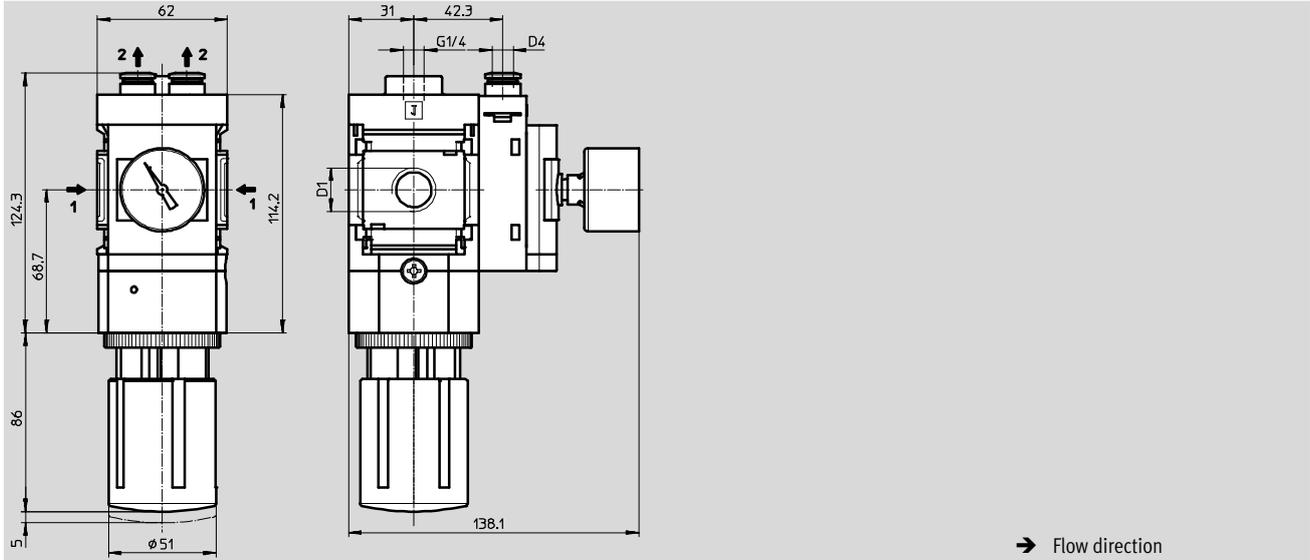
# Precision pressure regulators MS6-LRPB, MS series

Technical data

## Dimensions – Alternative mounting position

Download CAD data → [www.festo.com](http://www.festo.com)

Rotary knob underneath KD, angled outlet block BD/BE



Type	D1	D4
MS6-LRPB-1/2-...-KD-BD	G1/2	QS-8
MS6-LRPB-1/2-...-KD-BE		QS-10

- | - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRPB, MS series

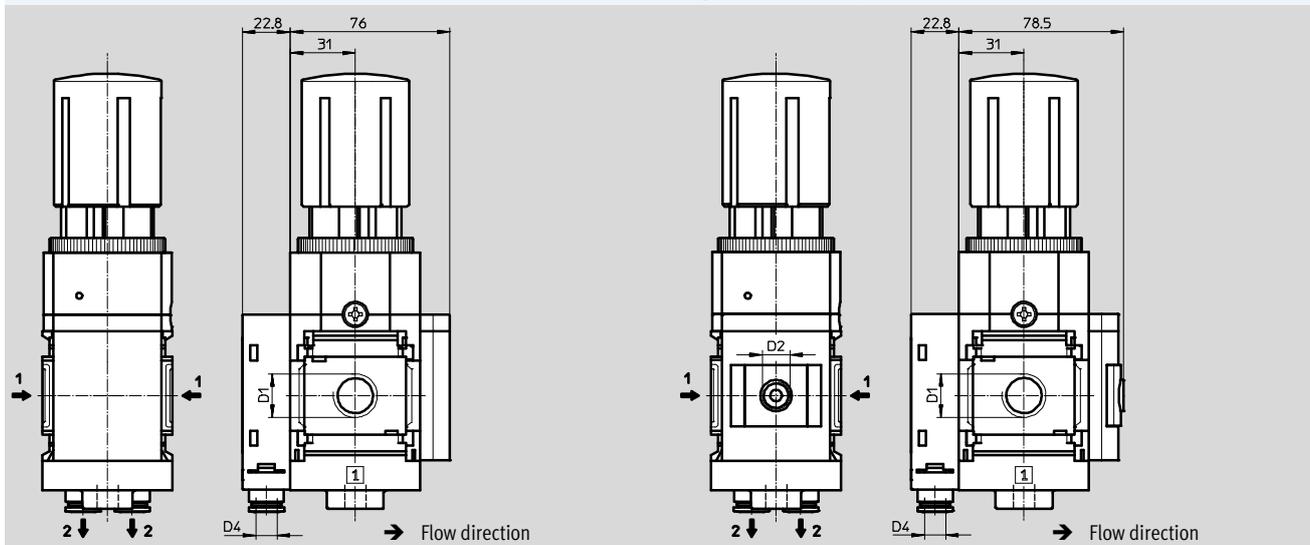
Technical data

## Dimensions – Pressure gauge alternatives

Download CAD data → [www.festo.com](http://www.festo.com)

Cover plate VS, angled outlet block BD/BE

Adapter plate A8/A4 for EN pressure gauge 1/8/1/4, without pressure gauge, angled outlet block BD/BE



Type	D1	D2	D4
MS6-LRPB-1/2-...-VS-BD	G1/2	-	QS-8
MS6-LRPB-1/2-...-VS-BE			QS-10
MS6-LRPB-1/2-...-A8-BD	G1/2	G1/8	QS-8
MS6-LRPB-1/2-...-A8-BE			QS-10
MS6-LRPB-1/2-...-A4-BD	G1/2	G1/4	QS-8
MS6-LRPB-1/2-...-A4-BE			QS-10

|| Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRPB, MS series

Technical data

**Dimensions – Pressure gauge alternatives** Download CAD data → [www.festo.com](http://www.festo.com)

Pressure sensor with LCD display AD1 ... AD4, angled outlet block BD/BE Technical data → Internet: [sde1](#)

Variant AD1:  
SDE1-D10-G2-MS-L-P1-M8 with 3-pin plug M8x1, 1 switching output PNP

Variant AD2:  
SDE1-D10-G2-MS-L-N1-M8 with 3-pin plug M8x1, 1 switching output NPN

Variant AD3:  
SDE1-D10-G2-MS-L-PI-M12 with 4-pin plug M12x1, 1 switching output PNP and 4 ... 20 mA analogue

Variant AD4:  
SDE1-D10-G2-MS-L-NI-M12 with 4-pin plug M12x1, 1 switching output NPN and 4 ... 20 mA analogue

Pressure sensor without LCD display (operational status indicator only) AD7 ... AD10, angled outlet block BD/BE Technical data → Internet: [sde5](#)

Variant AD7:  
SDE5-D10-O-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/O contact

Variant AD8:  
SDE5-D10-C-...-P-M8 with 3-pin plug M8x1, threshold value comparator, 1 switching output PNP, N/C contact

Variant AD9:  
SDE5-D10-O3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/O contact

Variant AD10:  
SDE5-D10-C3-...-P-M8 with 3-pin plug M8x1, window comparator, 1 switching output PNP, N/C contact

Type	D1	D3	D4	L1
MS6-LRPB-1/2-...-AD1/AD2-BD	G1/2	M8x1	QS-8	46.7
MS6-LRPB-1/2-...-AD1/AD2-BE			QS-10	
MS6-LRPB-1/2-...-AD3/AD4-BD	G1/2	M12x1	QS-8	55.8
MS6-LRPB-1/2-...-AD3/AD4-BE			QS-10	
MS6-LRPB-1/2-...-AD7/AD8/AD9/AD10-BD	G1/2	M8x1	QS-8	-
MS6-LRPB-1/2-...-AD7/AD8/AD9/AD10-BE			QS-10	

• † - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Precision pressure regulators MS6-LRPB, MS series

Technical data

## Dimensions – Rotary knob

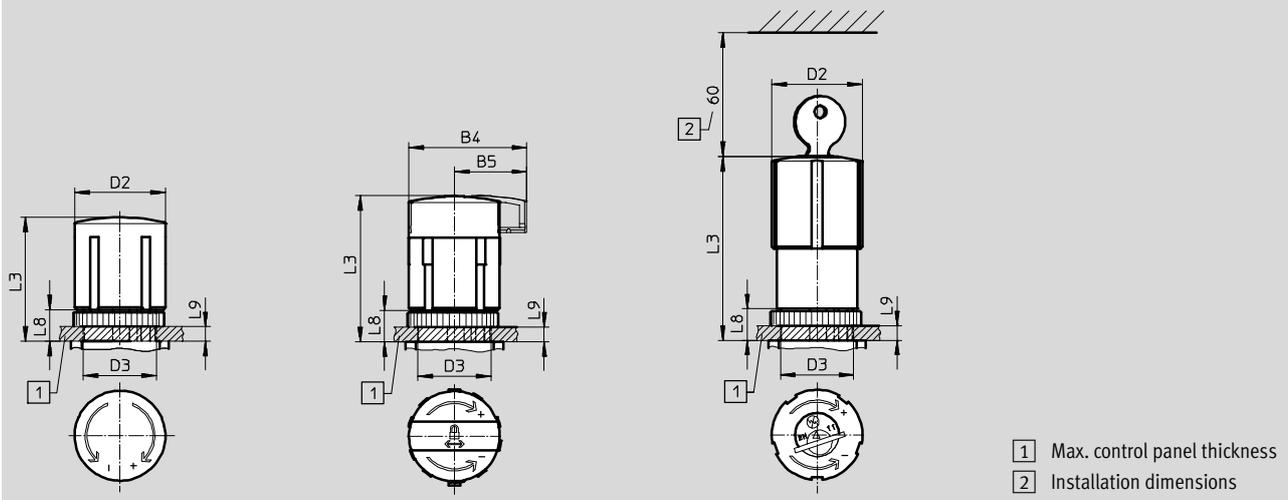
Download CAD data → [www.festo.com](http://www.festo.com)

For installation into control panel

Standard rotary knob with detent

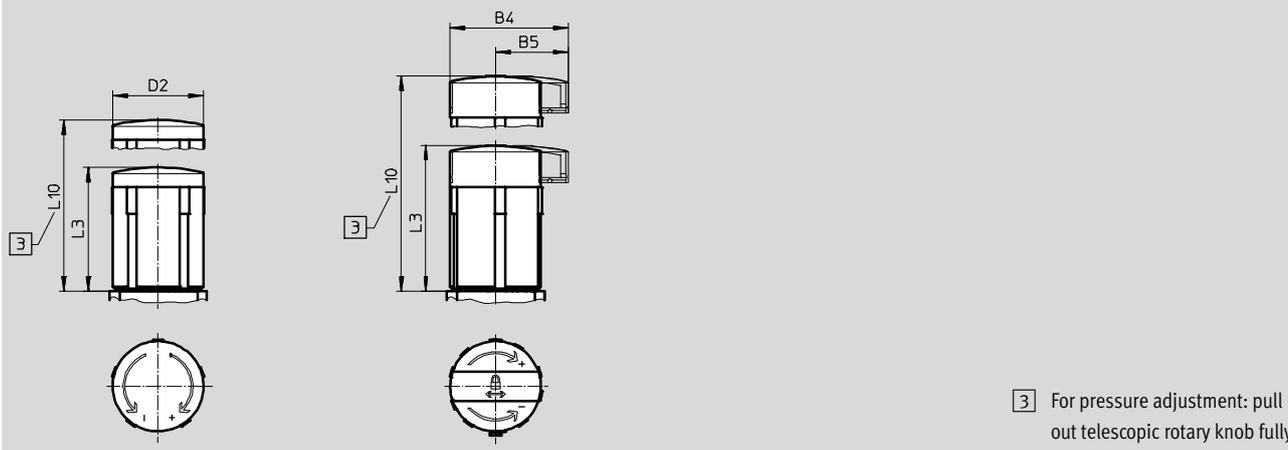
Standard rotary knob with detent,  
lockable via accessories AS

Rotary knob with integrated lock  
E11



Long rotary knob with detent LD

Long rotary knob with detent,  
lockable via accessories LD-AS



Type	B4	B5	D2	D3 +1	L3	L8	L9	L10
MS6-LRPB-...	-	-	51.2	44	86	22	14	-
MS6-LRPB-...-AS	64.4	38.8			93			
MS6-LRPB-...-E11	-	-	51.8	-	110	-	-	-
MS6-LRPB-...-LD	-	-	51.2	-	86	-	-	139
MS6-LRPB-...-LD-AS	64.4	38.8			95.5			148.5

## Precision pressure regulators MS6-LRPB, MS series

Technical data

Ordering data			
Adapter plate A8 for EN pressure gauge 1/8, standard rotary knob with detent, pressure output to rear without angled outlet block			
Size	Connection	Part No.	Type
Pressure regulation range 0.05 ... 2.5 bar, manually operated			
MS6	G1/2	<b>534914</b>	<b>MS6-LRPB-1/2-D4-A8<sup>1)</sup></b>
Pressure regulation range 0.1 ... 4 bar, manually operated			
MS6	G1/2	<b>534917</b>	<b>MS6-LRPB-1/2-D5-A8<sup>1)</sup></b>

1) Free of copper and PTFE

Ordering data			
Adapter plate A8 for EN pressure gauge 1/8, standard rotary knob with detent, pressure output to rear with angled outlet block QS-8			
Size	Connection	Part No.	Type
Pressure regulation range 0.05 ... 0.7 bar, manually operated			
MS6	G1/2	<b>534865</b>	<b>MS6-LRPB-1/2-D2-A8-BD<sup>1)</sup></b>
Pressure regulation range 0.1 ... 1.2 bar, manually operated			
MS6	G1/2	<b>534874</b>	<b>MS6-LRPB-1/2-D7-A8-BD<sup>1)</sup></b>

1) Free of copper and PTFE

# Precision pressure regulators MS6-LRPB, MS series

Ordering data – Modular products

Ordering table		Grid dimension	[mm]	62	Condi- tions	Code	Enter code
<b>M</b>	Module No.	<b>535007</b>					
	Series	Standard				<b>MS</b>	MS
	Size	6				<b>6</b>	6
	Function	Precision pressure regulator for manifold assembly				<b>-LRPB</b>	-LRPB
	Pneumatic connection	Female thread G $\frac{1}{2}$			<b>1</b>	- $\frac{1}{2}$	
		Connecting plate G $\frac{1}{4}$				<b>-AGB</b>	
		Connecting plate G $\frac{3}{8}$				<b>-AGC</b>	
		Connecting plate G $\frac{1}{2}$				<b>-AGD</b>	
		Connecting plate G $\frac{3}{4}$				<b>-AGE</b>	
	Pressure regulation range/ operation	0.05 ... 0.7 bar, manually operated				<b>-D2</b>	
		0.05 ... 2.5 bar, manually operated				<b>-D4</b>	
		0.1 ... 4 bar, manually operated				<b>-D5</b>	
		0.1 ... 12 bar, manually operated				<b>-D7</b>	
		0.1 ... 12 bar, pneumatically actuated (pressure range determined by means of pilot regulator)			<b>1 2</b>	<b>-PO</b>	
	Pressure gauge alternatives	Cover plate			<b>3</b>	<b>-VS</b>	
		Adapter plate for EN pressure gauge $\frac{1}{8}$ , without pressure gauge			<b>4</b>	<b>-A8</b>	
		Adapter plate for EN pressure gauge $\frac{1}{8}$ , with precision pressure gauge			<b>4</b>	<b>-A8M</b>	
		Adapter plate for EN pressure gauge $\frac{1}{4}$ , without pressure gauge			<b>4</b>	<b>-A4</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output PNP, 3-pin			<b>1 4 5</b>	<b>-AD1</b>	
		Pressure sensor with LCD display, plug M8, 1 switching output NPN, 3-pin			<b>1 4 5</b>	<b>-AD2</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output PNP, 4-pin, analogue output 4 ... 20 mA			<b>1 4 5</b>	<b>-AD3</b>	
		Pressure sensor with LCD display, plug M12, 1 switching output NPN, 4-pin, analogue output 4 ... 20 mA			<b>1 4 5</b>	<b>-AD4</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact			<b>1 5 6</b>	<b>-AD7</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact			<b>1 5 6</b>	<b>-AD8</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact			<b>1 5 6</b>	<b>-AD9</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact			<b>1 5 6</b>	<b>-AD10</b>	

**1**  $\frac{1}{2}$ , **PO**, **AD1 ... AD4**, **AD7 ... AD10**, **KD**, **E11**, **WPM**

**2** **PO**  
Not with EU certification EX4  
Not with long rotary knob LD  
Not with security AS, E11  
Not with mounting type WR

**3** **VS**  
Must be selected with flow direction Z without alternative mounting position KD or without alternative pressure output BD, BE  
Must be selected with alternative mounting position KD without flow direction Z or without alternative pressure output BD, BE

**4** **A8**, **A8M**, **A4**, **AD1 ... AD4**

In combination with flow direction Z only with alternative mounting position KD

**5** **AD1 ... AD4**, **AD7 ... AD10**

Measuring range max. 10 bar  
Not with pressure regulation range/operation D2, D4

**6** **AD7 ... AD10** In combination with flow direction Z only with alternative pressure output BD, BE or  
In combination with flow direction Z only with alternative mounting position KD

**M** Mandatory data

**O** Options

Transfer order code

535007 MS 6 - LRPB - - -

# Precision pressure regulators MS6-LRPB, MS series

Ordering data – Modular products

Ordering table					
Grid dimension	[mm]	62	Condi- tions	Code	Enter code
<b>0</b>	Rotary knob alternative	Long rotary knob	<b>7</b>	<b>-LD</b>	
	Alternative mounting position	Rotary knob underneath	<b>1</b> <b>8</b>	<b>-KD</b>	
	Security	Lockable via accessories		<b>-AS</b>	
		With integrated lock	<b>1</b>	<b>-E11</b>	
	Alternative pressure output (p max = 10 bar)	Angled outlet block QS-8		<b>-BD</b>	
		Angled outlet block QS-10		<b>-BE</b>	
	Type of mounting	Mounting bracket with knurled nut for regulator head	<b>9</b> <b>10</b>	<b>-WR</b>	
		Mounting bracket standard design	<b>11</b> <b>12</b>	<b>-WP</b>	
		Mounting bracket for attaching the service units	<b>1</b> <b>9</b> <b>11</b>	<b>-WPM</b>	
		Mounting bracket for large wall gap	<b>11</b> <b>13</b>	<b>-WPB</b>	
		Mounting bracket centrally at rear (wall mounting top and bottom), connecting plates not required	<b>9</b>	<b>-WB</b>	
	EU certification	II 2GD to EU Directive 94/9/EG		<b>-EX4</b>	
	UL certification	cULus, ordinary location for Canada and USA		<b>-UL1</b>	
	Flow direction	Pressure output to front (without pressure output, no pressure gauge)		<b>-Z</b>	

**7** LD Not with integrated lock E11

**8** KD In combination with pressure gauge alternatives A8, A4, AD1 ... AD4, AD7 ... AD10 only with flow direction Z

**9** WR, WB, WPM  
Only with flow direction Z  
Not with alternative mounting position KD

**10** WR  
Only with flow direction Z  
Not with long rotary knob LD

**11** WP, WPM, WPB  
Only with connecting plate AGB, AGC, AGD or AGE

**12** WP  
Not with alternative mounting position KD  
Either only with flow direction Z  
or only with alternative pressure output BD, BE

**13** WPB  
Not with alternative mounting position KD  
Not with alternative pressure output BD, BE  
Not with flow direction Z

**M** Mandatory data

**0** Options

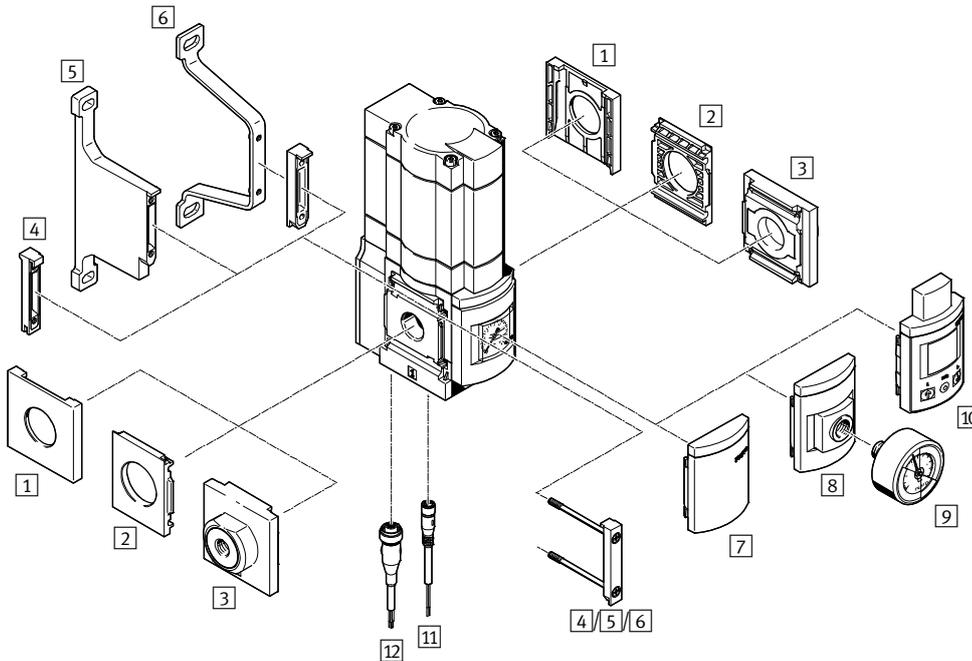
**Transfer order code**

-  -  -  -  -  -  -  -

# Electrical pressure regulators MS6-LRE, MS series

Peripherals overview

## Electrical pressure regulators MS6-LRE



Note

Additional accessories:

- Module connector for combination with sizes MS4/MS6 or size MS9 → Internet: amv, rmv, armv
- Adapter plate for mounting on profiles → Internet: ipm-80, ipm-40-80, ipm-80-80

### Mounting attachments and accessories

		Individual unit		Combination		→ Page/Internet
		Without connecting plate	With connecting plate	Without connecting plate	With connecting plate	
1	Cover cap MS6-END	-	-	■	-	ms6-end
2	Mounting plate MS6-AEND	■ <sup>1)</sup>	-	■ <sup>2)</sup>	-	ms6-aend
3	Connecting plate-SET MS6-AG...	-	■ <sup>1)</sup>	-	■ <sup>2)</sup>	ms6-ag
	Connecting plate-SET MS6-AQ...	-	■ <sup>1)</sup>	-	■ <sup>2)</sup>	ms6-aq
4	Module connector MS6-MV	-	-	■	■	ms6-mv
5	Mounting bracket MS6-WPB	■	■	■	■	ms6-wpb
6	Mounting bracket MS6-WPE	■	■	■	■	ms6-wpe
7	Cover plate VS	■	■	■	■	73
8	Adapter plate for EN pressure gauge 1/4 A4	■	■	■	■	73
9	Pressure gauge MA	■	■	■	■	95
10	Control unit with display OP	■	■	■	■	73
11	Connecting cable NEBU-M8...-LE3	■	■	■	■	95
12	Connecting cable NEBU-M12...-LE5	■	■	■	■	95

1) Mounting bracket MS6-WPB/WPE is required for mounting.

2) Module connector MS6-MV or mounting bracket MS6-WPB/WPE is required for mounting.

# Electrical pressure regulators MS6-LRE, MS series

Type codes

	MS	6	-	LRE	-	1/4	-	D6	-	PU
<b>Series</b>										
MS	Standard service unit									
<b>Size</b>										
6	Grid dimension 62 mm									
<b>Service function</b>										
LRE	Electrical pressure regulator									
<b>Pneumatic connection</b>										
1/4	Thread G1/4									
1/2	Thread G1/2									
<b>Pressure regulation range</b>										
D6	Pressure regulation range 0.3 ... 7 bar									
D7	Pressure regulation range 0.5 ... 12 bar									
<b>Electrically controlled pressure output (integrated pressure sensor with electrical output)</b>										
	None									
PU	Plug, M8, 3-pin, V out									

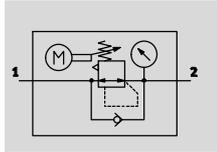
**Further variants can be ordered using the modular system → 73**

- Female thread
- Connecting plates
- Pressure regulation range
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Secondary venting
- Electrically controlled pressure output
- Sensor cables
- Supply cables
- Type of mounting
- UL certification
- Flow direction

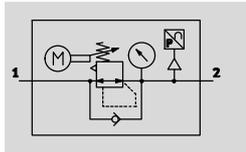
# Electrical pressure regulators MS6-LRE, MS series

Technical data

with pressure gauge



with pressure gauge and integrated pressure sensor



-  - Flow rate  
2,200 ... 7,500 l/min
-  - Temperature range  
0 ... +50 °C
-  - Operating pressure  
0.8 ... 20 bar



-  - Note

The electrical pressure regulator is not suitable for the set-up of closed control loops.

The electrical pressure regulator maintains incoming compressed air at the set output pressure. It also maintains a constant output pressure independent of pressure fluctuations and air consumption.

The output pressure is set indirectly via an integrated electrical drive unit. The drive unit can be operated either with digital inputs via the M12 plug or

using the optional control and display unit.

The direction of rotation of the drive unit is thus pre-set, which makes adjustment of the output pressure in the rising or falling direction possible.

In the event of a power failure, the last drive unit or output pressure setting is saved. Pneumatic pressure regulation continues to function.

- Four pressure regulation ranges: 0.3 ... 4 bar, 0.3 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Optional control unit with display
- Optional integrated pressure sensor with electrical output
- Constant output pressure even in the event of a power failure thanks to the fail-safe function
- Available with or without secondary venting

General technical data		
Size	MS6	
Pneumatic connection 1, 2		
Female thread	G $\frac{1}{4}$ , G $\frac{3}{8}$ or G $\frac{1}{2}$	
Connecting plate AG...	G $\frac{1}{4}$ , G $\frac{3}{8}$ , G $\frac{1}{2}$ or G $\frac{3}{4}$	
Connecting plate AQ...	NPT $\frac{1}{4}$ , NPT $\frac{3}{8}$ , NPT $\frac{1}{2}$ or NPT $\frac{3}{4}$	
Design	Electrically adjustable pressure regulator	
Regulating function	Output pressure constant, with primary pressure compensation, with/without secondary venting	
Type of mounting	Via accessories	
	In-line installation	
Assembly position	Any, preferably vertical	
Pressure regulation range	D5 [bar]	0.3 ... 4
	D6 [bar]	0.3 ... 7
	D7 [bar]	0.5 ... 12
	D8 [bar]	0.5 ... 16
Max. hysteresis	[bar]	0.25
Pressure indicator	With pressure gauge	
	With control unit	

-  - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Electrical pressure regulators MS6-LRE, MS series

Technical data

Standard nominal flow rate $q_{nN}^{1)}$ [l/min]				
Pneumatic connection		G $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{1}{2}$
Pressure regulation range	D5	2,400 <sup>2)</sup>	5,500 <sup>2)</sup>	7,500 <sup>2)</sup>
	D6	3,000	5,800	6,500
	D7	2,700	4,500	5,500
	D8	2,200	4,000	4,500

1) Measured at  $p_1 = 10$  bar and  $p_2 = 6$  bar,  $\Delta p = 1$  bar

2) Measured at  $p_1 = 10$  bar and  $p_2 = 3$  bar,  $\Delta p = 1$  bar

Electrical data					
		Without integrated pressure sensor		With integrated pressure sensor	
				PI (I out)	PU (V out)
Analogue output	[V]	-		-	0 ... 10
	[mA]	-		4 ... 20	-
Analogue outputs, absolute accuracy at 25 °C	[%]	-		±3	±3
Cable interface	Inputs	Plug M12x1, 5-pin			
	Outputs	-		Plug M8x1, 3-pin	
Design of inputs	To IEC 61131-2, no electrical isolation				
Nominal operating voltage	[V DC]	24			
Permissible voltage fluctuations	[%]	±10			
Nominal current consumption	[A]	Max. 1			
Max. current consumption	[A]	3.5			
Duration of actuation at 25°C	[s]	Max. 90 <sup>1)</sup>			
Protection against short circuit	For all electrical connections				
Protection class	IP65				

1) In order to prevent the drive from overheating, a control/pause ratio of 1:3 must be observed.

Operating and environmental conditions	
Operating pressure	[bar] 0.8 ... 20 (0.8 ... 10) <sup>1)</sup>
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
	Inert gases
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)
Ambient temperature	[°C] 0 ... +50
Temperature of medium	[°C] 0 ... +50
Storage temperature	[°C] -10 ... +50
Corrosion resistance class CRC <sup>2)</sup>	2
CE symbol (declaration of conformance)	In accordance with EU EMC Directive <sup>3)</sup>
UL certification	cULus recognized (OL)

1) Value in brackets applies to MS6-LRE with UL certification.

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

3) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → User documentation.

If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

# Electrical pressure regulators MS6-LRE, MS series

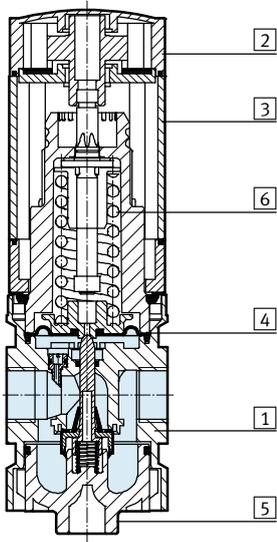
Technical data



Weights [g]	
Electrical pressure regulator	1,280

## Materials

Sectional view

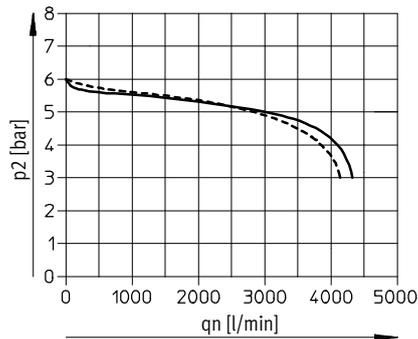


Electrical pressure regulator		
1	Body	Die-cast aluminium
2	Drive housing	PA, reinforced
3	Profile housing	Wrought aluminium alloy
4	Diaphragm	NBR
5	Bottom cap	PET, fibreglass reinforced
6	Springs	Steel
-	Display and control unit	PA
-	Seals	NBR

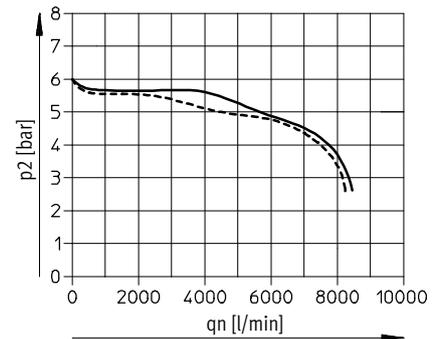
## Standard flow rate $q_n$ as a function of output pressure $p_2$

Input pressure  $p_1 = 10$  bar

MS6-LRE-1/4

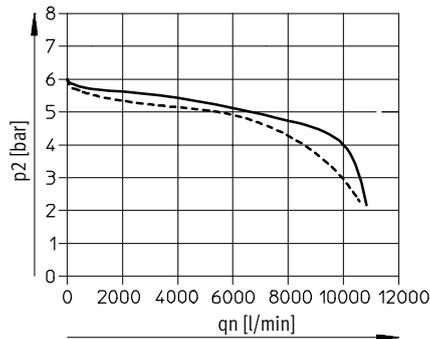


MS6-LRE-3/8



MS6-LRE-1/2

Input pressure  $p_1 = 10$  bar



— D6: 0.3 ... 7 bar  
 - - - D7: 0.5 ... 12 bar

— D6: 0.3 ... 7 bar  
 - - - D7: 0.5 ... 12 bar

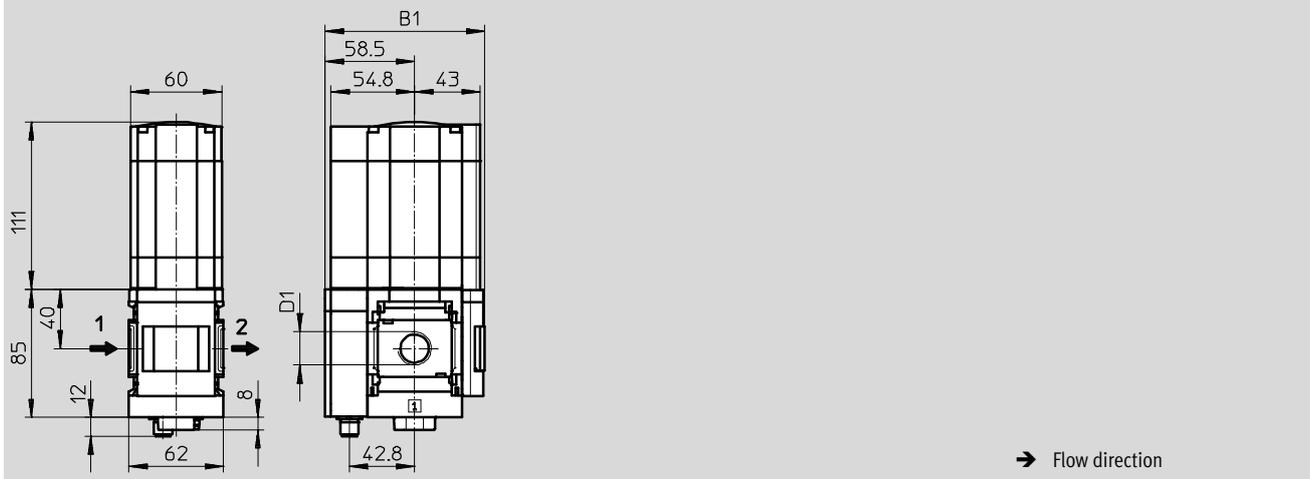
# Electrical pressure regulators MS6-LRE, MS series

Technical data

## Dimensions – Standard

Download CAD data → [www.festo.com](http://www.festo.com)

With pressure gauge, display unit [bar]



→ Flow direction

Type	B1 Pressure gauge		D1
	Standard scale	Red-green scale	
MS6-LRE-1/4	104.5	106	G1/4
MS6-LRE-3/8			G3/8
MS6-LRE-1/2			G1/2

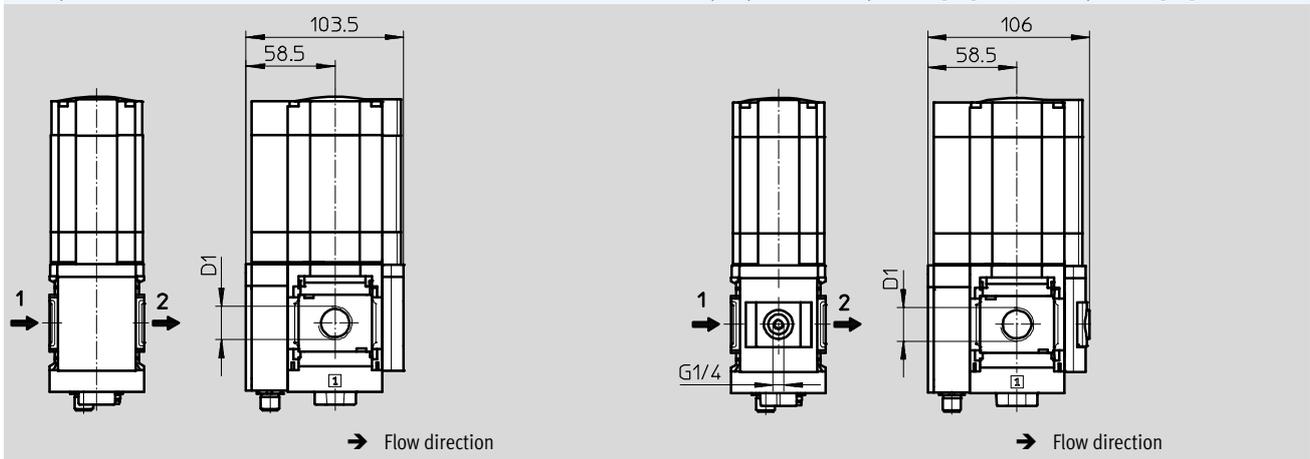
• Note: This product conforms to ISO 1179-1 and to ISO 228-1

## Dimensions – Pressure gauge alternatives

Download CAD data → [www.festo.com](http://www.festo.com)

Cover plate VS

Adapter plate A4 for EN pressure gauge 1/4, without pressure gauge



→ Flow direction

→ Flow direction

Type	D1
MS6-LRE-1/4	G1/4
MS6-LRE-3/8	G3/8
MS6-LRE-1/2	G1/2

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Electrical pressure regulators MS6-LRE, MS series

Technical data

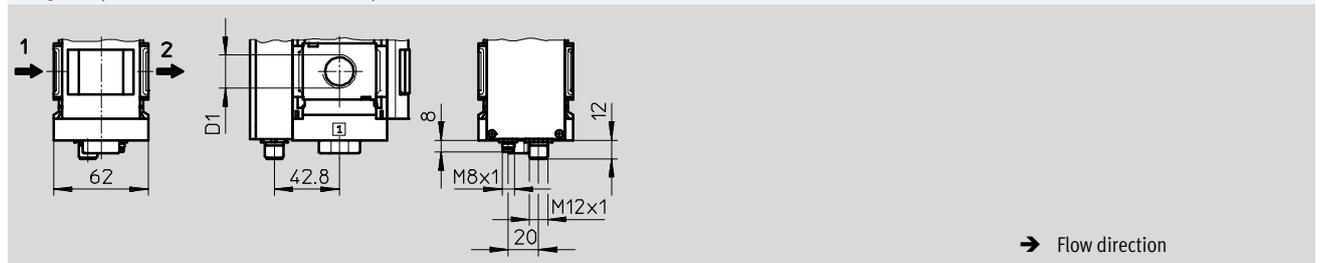
**Dimensions – Pressure gauge alternatives** Download CAD data → [www.festo.com](http://www.festo.com)  
Control unit with display OP



Type	D1
MS6-LRE-1/4	G1/4
MS6-LRE-3/8	G3/8
MS6-LRE-1/2	G1/2

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

**Dimensions – Electrically controlled pressure output** Download CAD data → [www.festo.com](http://www.festo.com)  
Integrated pressure sensor with electrical output PI/PU



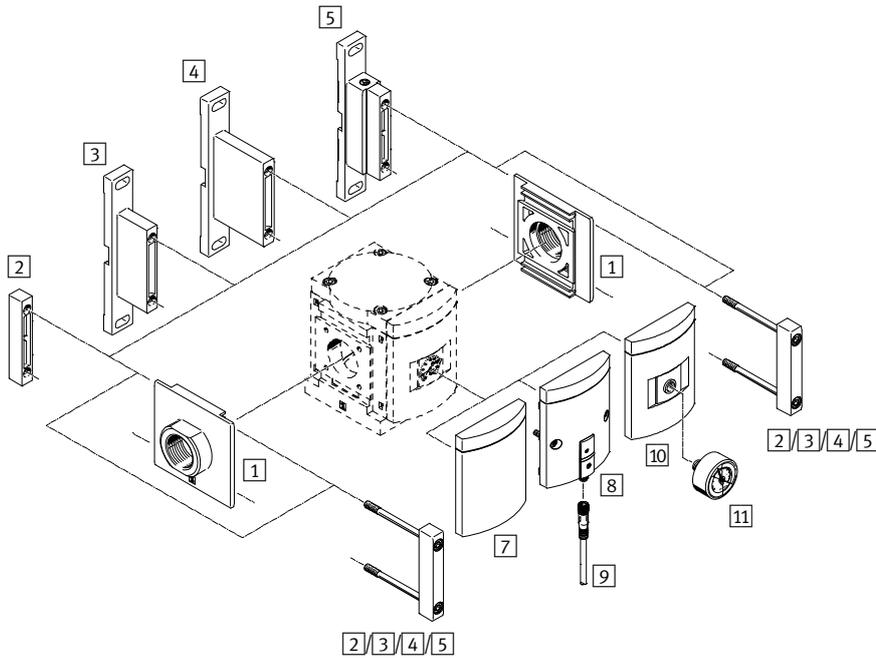
Ordering data					
Pressure gauge					
Size	Connection	Pressure regulation range 0.3... 7 bar		Pressure regulation range 0.5... 12 bar	
		Part No.	Type	Part No.	Type
Standard					
MS6	G1/4	-	-	535364	MS6-LRE-1/4-D7
	G1/2	535348	MS6-LRE-1/2-D6	-	-
Electrically controlled pressure output (integrated pressure sensor with voltage output), M8x1 plug, 3-pin					
MS6	G1/4	535362	MS6-LRE-1/4-D6-PU	-	-



# Pressure regulators MS9-LR, MS series

Peripherals overview

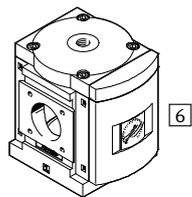
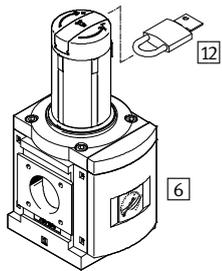
## Pressure regulator MS9-LR



-  - Note  
 Additional accessories:  
 - Module connector for combinations with size MS6, MS9 or MS12  
 → Internet: rmv, armv

manually operated

pneumatically actuated



## Pressure regulators MS9-LR, MS series

Peripherals overview

Mounting attachments and accessories						
		Individual unit		Combination Module without connect- ing thread, without connecting plate G	→ Page/ Internet	
		With female thread ¾ or 1	With connecting plate AG...			
			Without EU certification EX4	With EU certification EX4		
1	Connecting plate-SET MS9-AG...	-	■	■	■	ms9-ag
2	Module connector MS9-MV	-	-	-	■	ms9-mv
3	Mounting bracket MS9-WP	■	■	■	■	ms9-wp
4	Mounting bracket MS9-WPB	■	■	■	■	ms9-wp
5	Mounting bracket MS9-WPM	■	■	-	■	ms9-wp
6	MS pressure gauge AG	■	■	■	■	84
7	Cover plate VS	■	■	■	■	84
8	Pressure sensor without display AD7 ... AD10	■	■	-	■	84
9	Connecting cable NEBU-M8...-LE3	■	■	-	■	95
10	Adapter plate for EN pressure gauge ¼ A4	■	■	■	■	84
11	Pressure gauge MA	■	■	■	■	95
12	Padlock LRVS-D	■	■	■	■	95

# Pressure regulators MS9-LR, MS series

Type codes

FESTO

		MS	9	-	LR	-	G	-	D5	-	DI	-	AG	-	BAR	-	AS
<b>Series</b>																	
MS	Standard service unit																
<b>Size</b>																	
9	Grid dimension 90 mm																
<b>Service function</b>																	
LR	Pressure regulator																
<b>Connection size</b>																	
G	Module without connecting thread, without connecting plate																
<b>Pressure regulation range/operation</b>																	
D5	0.5 ... 4 bar, manually operated																
D6	0.5 ... 7 bar, manually operated																
D7	0.5 ... 12 bar, manually operated																
<b>Alternative actuation principle</b>																	
	Piloted																
DI	Directly actuated (only with pressure regulation range D5/D6)																
<b>Pressure gauge</b>																	
AG	MS pressure gauge																
<b>Pressure gauge scale</b>																	
BAR	Bar																
<b>Security</b>																	
AS	Rotary knob with detent, can be locked using accessories																

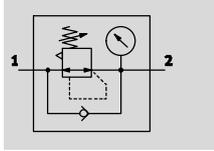
## Additional variants can be ordered using the modular product system → 84

- Connecting plates
- Pressure regulation range/operation
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Secondary venting
- Security lock
- Type of mounting
- EU certification
- UL certification
- Flow direction

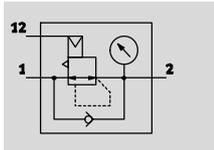
# Pressure regulators MS9-LR, MS series

Technical data

Pressure regulation range/operation D5/D6/D7/D8, manually operated



P0, pneumatically actuated



-  - Flow rate  
6,500 ... 33,000 l/min
-  - Temperature range  
-10 ... +60 °C
-  - Operating pressure  
1 ... 20 bar



The pressure regulator maintains an essentially constant output pressure p2 independent of pressure fluctuations in the system and air consumption. The output pressure p2 can be set within the pressure regulation range either manually using the rotary

knob or pneumatically via a pilot pressure p12 by an external pilot regulator. When switching off the operating pressure, the output pressure p2 is vented via connection 3 (secondary venting).

- Good regulation characteristics with low hysteresis and primary pressure compensation
- High flow rate with minimal pressure drop
- Piloted or directly actuated diaphragm regulator
- Four pressure regulation ranges: 0.5 ... 4 bar, 0.5 ... 7 bar, 0.5 ... 12 bar and 0.5 ... 16 bar
- Available with or without secondary venting
- Actuator lock to protect set values against adjustment
- Return flow option for exhausting from output port 2 to output port 1 already integrated
- Optional pressure sensor
- Optional device variant EX4 for use in potentially explosive areas in zones 1, 2, 21 and 22

General technical data		
Pneumatic connection 1, 2		
Female thread		G3/4 or G1
Connecting plate AG...		G1/2, G3/4, G1, G1 1/4 or G1 1/2
Module without connecting thread/plate G		-
Pilot air connection 12 with pressure regulation range/operation P0		
		G1/4
Design		
		Piloted diaphragm regulator
		Directly actuated diaphragm regulator
Regulator type		
Piloted		Output pressure constant, with return flow action, with primary pressure compensation, with secondary venting
Directly actuated		Output pressure constant, with return flow action, with/without secondary venting
Type of mounting		
		Via accessories
		In-line installation
		Front panel mounting
Mounting position		
		Any <sup>1)</sup>
Actuation security		
		Rotary knob with detent
		Rotary knob with detent, can be locked using accessories
		Rotary knob with integrated lock
Pressure regulation range/operation		
D5	[bar]	0.5 ... 4, manually operated
D6	[bar]	0.5 ... 7, manually operated
D7	[bar]	0.5 ... 12, manually operated (0.5 ... 10 with pressure sensor variant AD...)
D8	[bar]	0.5 ... 16, manually operated (0.5 ... 10 with pressure sensor variant AD...)
P0	[bar]	0.5 ... 16, pneumatically actuated <sup>2)</sup>
Max. pressure hysteresis		
	[bar]	0.4

1) The pressure regulator must be mounted vertically when combined with a pressure sensor as condensate must not collect in the pressure sensor.

2) Output pressure p2 corresponds roughly to the applied pilot pressure p12.

-  - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS9-LR, MS series

FESTO

Technical data

General technical data	
Pressure display	Via pressure sensor for displaying output pressure via operational status indicator and electrical output
	Via pressure gauge for displaying output pressure
	Via pressure gauge with red/green scale for displaying output pressure
	G $\frac{3}{4}$ prepared

Standard nominal flow rate $q_{nN}^{1)2)}$ [l/min]					
Design		Piloted diaphragm regulator		Directly actuated diaphragm regulator DI	
Pneumatic connection		G $\frac{3}{4}$	G1	G $\frac{3}{4}$	G1
Pressure regulation range	D5	19,000 <sup>3)</sup>	26,000 <sup>3)</sup>	14,000 <sup>3)</sup>	20,000 <sup>3)</sup>
	D6	17,000	20,000	14,000	11,000
	D7	17,000	20,000	–	–
	D8	17,000	20,000	–	–
	P0	21,000	25,000	–	–

1) All values  $\pm 15\%$

2) Measured at  $p_1 = 10$  bar and  $p_2 = 6$  bar,  $\Delta p = 1$  bar

3) Measured at  $p_1 = 10$  bar and  $p_2 = 4$  bar,  $\Delta p = 1$  bar

Operating and environmental conditions		
EU certification	–	EX4
Operating pressure [bar]	1 ... 20	
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]	
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)	Operation with lubricated medium not possible
Ambient temperature [°C]	–10 ... +60 (0 ... +50) <sup>1)</sup>	
Temperature of medium [°C]	–10 ... +60 (0 ... +50) <sup>1)</sup>	
Storage temperature [°C]	–10 ... +60	
Corrosion resistance class CRC <sup>2)</sup>	2	
UL certification	cULus recognized (OL)	

1) Value in brackets applies to MS9-LR with pressure sensor AD...

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

ATEX	
EU certification	EX4
ATEX category gas	II 2G
Ex-ignition protection type gas	c T6 X
ATEX category dust	II 2D
EX-ignition protection type dust	c T60 °C X
ATEX ambient temperature	–10 °C $\leq$ Ta $\leq$ +60 °C
CE mark (see declaration of conformity)	To EU Explosion Protection Directive (ATEX)

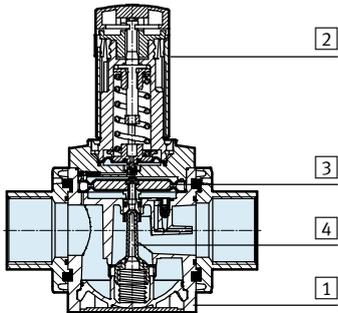
# Pressure regulators MS9-LR, MS series

Technical data

Weight [g]	
Pressure regulator	1,400
Pressure regulator with rotary knob with integrated lock E11	1,700

## Materials

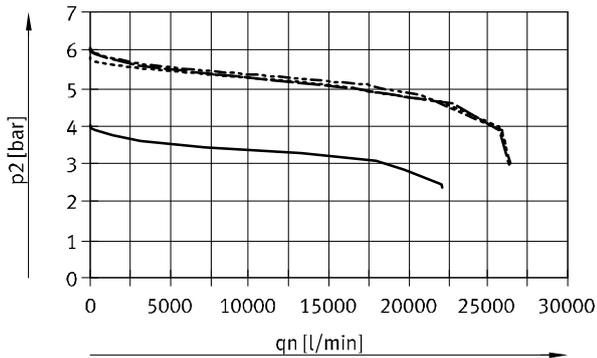
Sectional view



Pressure regulator		
1	Housing	Die-cast aluminium
2	Rotary knob	PA
	Rotary knob with integrated lock E11	Aluminium
3	Diaphragm	NBR
4	Valve stem	Wrought aluminium alloy, NBR, POM
-	Cover	PA, reinforced
-	Connecting plate, module connector, mounting bracket	Die-cast aluminium
-	Seals	NBR
Note on materials		RoHS-compliant

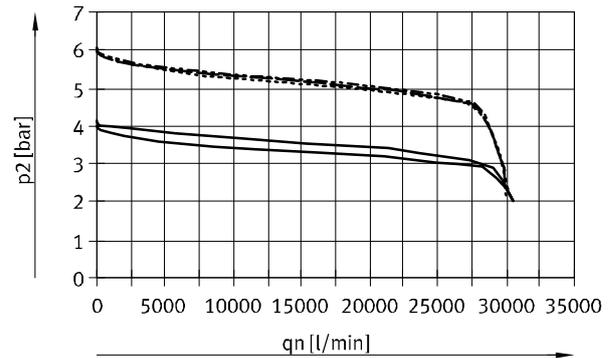
## Standard flow rate $q_n$ as a function of output pressure $p_2$ at operating pressure $p_1 = 10$ bar

Piloted diaphragm regulator  
Pneumatic connection G $\frac{3}{4}$



— D5: 0.5 ... 4 bar      - - - - D7: 0.5 ... 12 bar  
 - - - - D6: 0.5 ... 7 bar      ······ D8: 0.5 ... 16 bar

## Pneumatic connection G1



# Pressure regulators MS9-LR, MS series

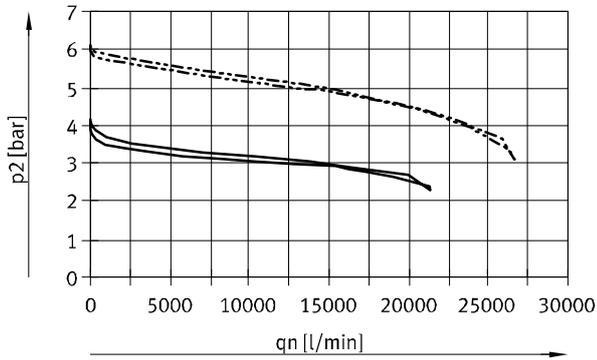
Technical data



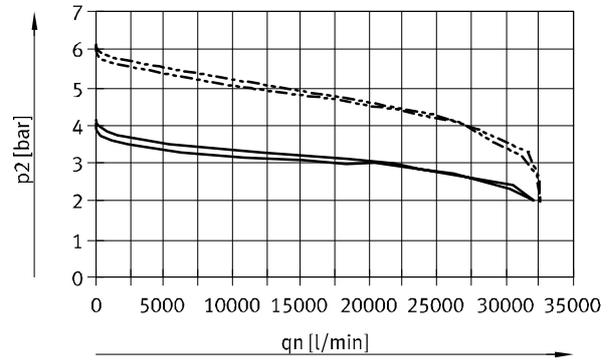
## Standard flow rate $q_n$ as a function of output pressure $p_2$ at operating pressure $p_1 = 10$ bar

Directly actuated diaphragm regulator DI

Pneumatic connection  $G\frac{3}{4}$



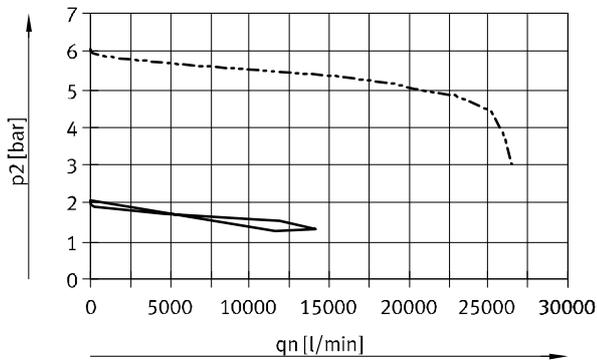
Pneumatic connection G1



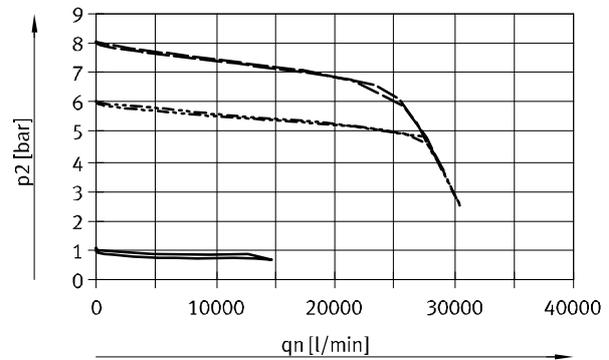
— D5: 0.5 ... 4 bar  
 - - - D6: 0.5 ... 7 bar

## External pilot regulator, pressure regulation range/operation PO

Pneumatic connection  $G\frac{3}{4}$



Pneumatic connection G1



# Pressure regulators MS9-LR, MS series

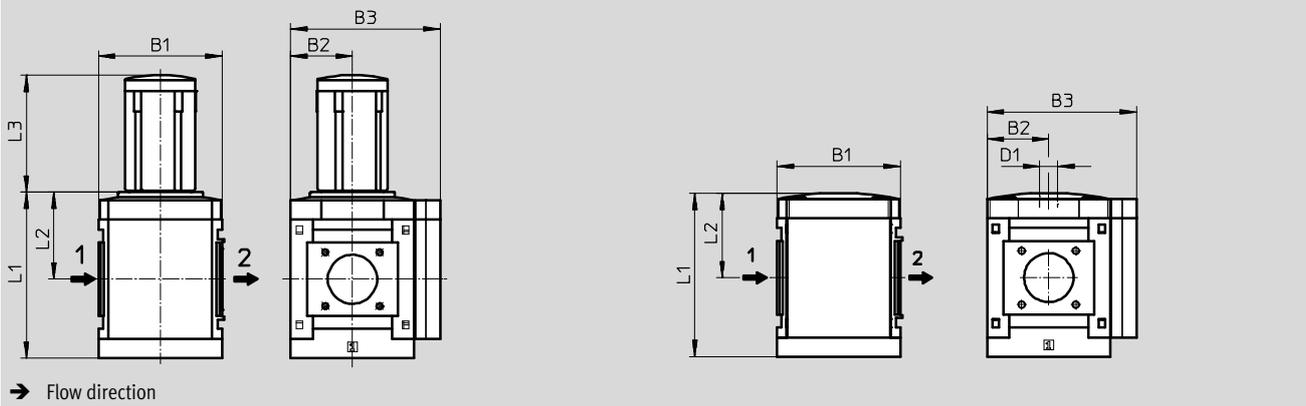
Technical data

## Dimensions – Basic version

Download CAD data → [www.festo.com](http://www.festo.com)

Pressure regulation range/operation D5/D6/D7/D8, manually operated, without connecting thread G, cover plate VS, rotary knob with detent

Pressure regulation range/operation PO, pneumatically actuated, without connecting thread G, cover plate VS



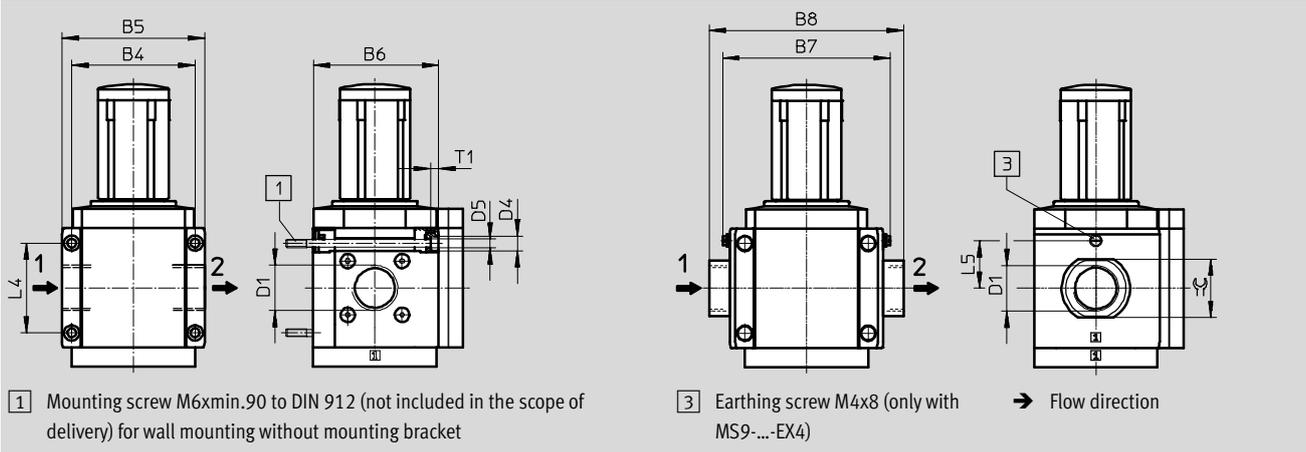
Type	B1	B2	B3	D1	L1		L2		L3
					Piloted	Directly actuated DI	Piloted	Directly actuated DI	
MS9-LR-G-D5/D6/D7/D8	90	45	109	-	129	122	71.4	64	86
MS9-LR-G-PO				G $\frac{1}{4}$	120	-	62	-	-

## Dimensions – Connecting thread/connecting plate

Download CAD data → [www.festo.com](http://www.festo.com)

With connecting thread  $\frac{3}{4}$  or 1

With connecting plate AG...



1 Mounting screw M6xmin.90 to DIN 912 (not included in the scope of delivery) for wall mounting without mounting bracket

3 Earthing screw M4x8 (only with MS9-...-EX4)

Type	B4	B5	B6	B7		B8	D1	D4	D5	L4	L5		T1	≅
				-	EX4						-	EX4		
MS9-LR- $\frac{3}{4}$	90	104	91.5	-	-	-	G $\frac{3}{4}$	11	6.5	66	-	6	-	
MS9-LR-1				G1	-									
MS9-LR-AGD	-	-	-	112	122	132	G $\frac{1}{2}$	-	-	-	35	-	30	
MS9-LR-AGE						132	G $\frac{3}{4}$						36	
MS9-LR-AGF						142	G1						41	
MS9-LR-AGG						162	G $\frac{1}{4}$						50	
MS9-LR-AGH						176	G $\frac{1}{2}$						55	

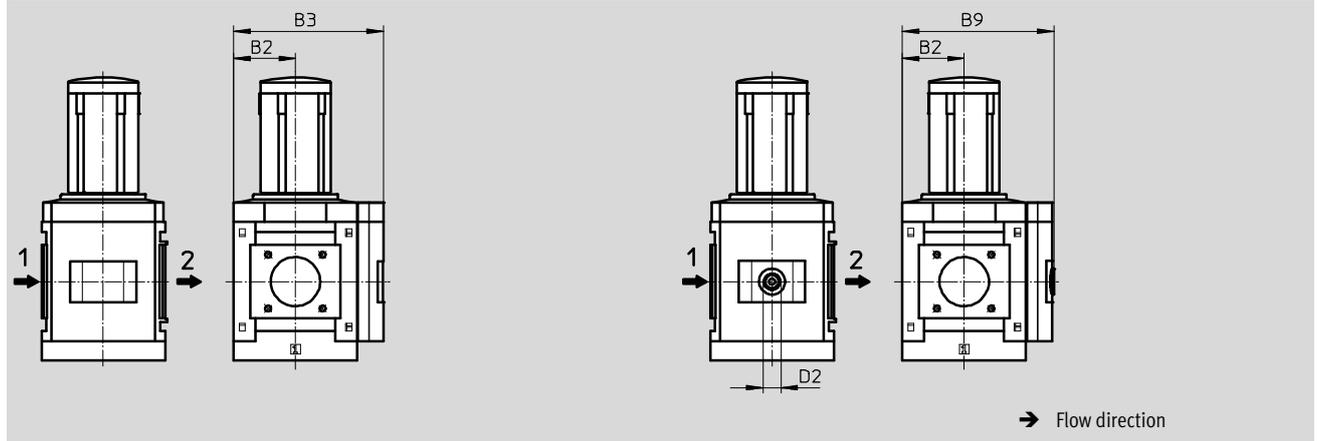
– Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS9-LR, MS series

Technical data

**FESTO**

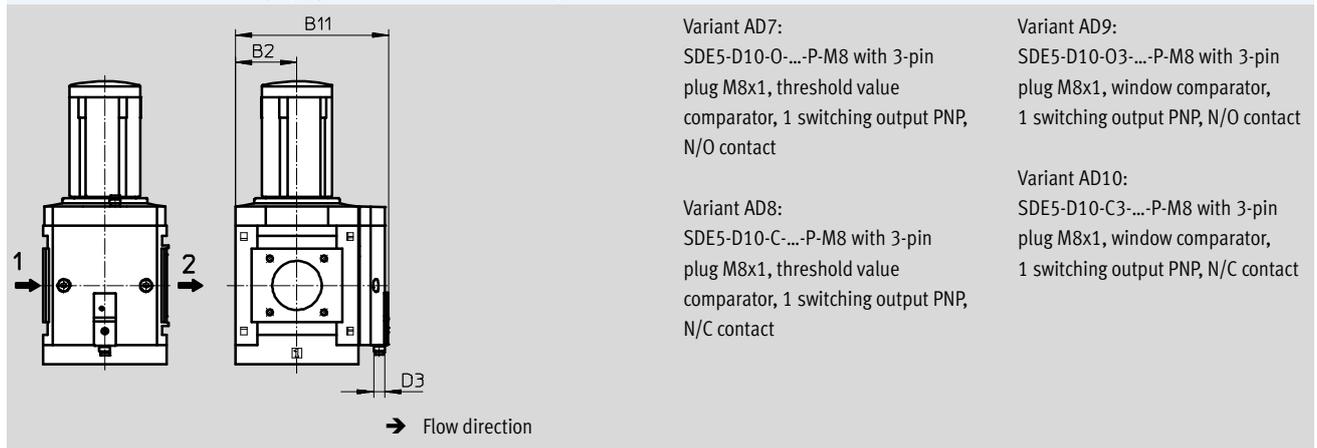
**Dimensions – Pressure gauge alternatives** Download CAD data → [www.festo.com](http://www.festo.com)  
 Integrated MS pressure gauge with standard scale AG or red/green scale RG Adapter plate A4 for EN pressure gauge 1/4, without pressure gauge



Type	B2	B3	B9	D2
MS9-LR-...-AG/RG	45	109	-	-
MS9-LR-...-A4		-	110	G1/4

|| Note: This product conforms to ISO 1179-1 and to ISO 228-1

**Dimensions – Pressure gauge alternatives** Download CAD data → [www.festo.com](http://www.festo.com)  
 Pressure sensor without LCD display (operational status indicator only) AD7...AD10 Technical data → Internet: [sde5](http://sde5.festo.com)



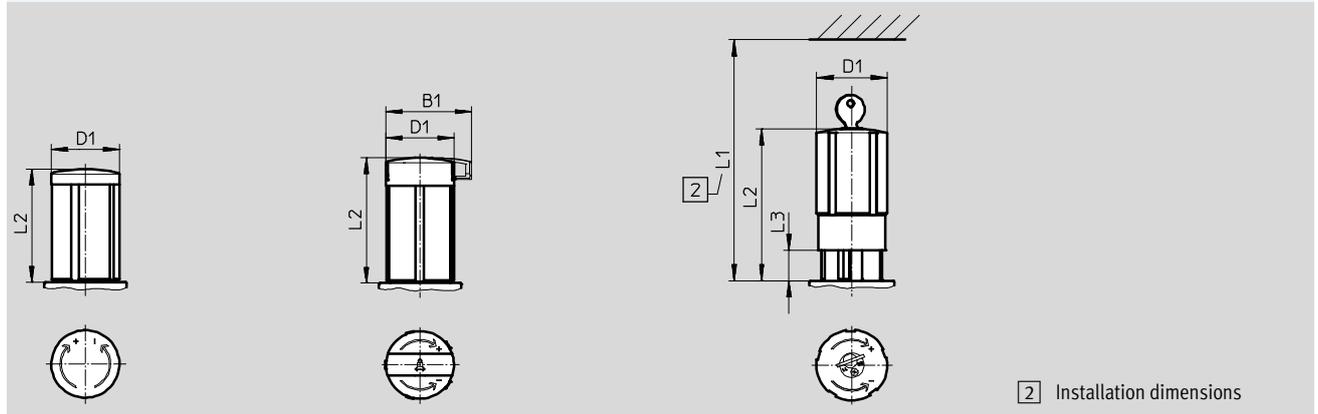
Type	B2	B11	D3
MS9-LR-...-AD7/AD8/AD9/AD10	45	112	M8

# Pressure regulators MS9-LR, MS series

Technical data

**Dimensions – Rotary knob** Download CAD data → [www.festo.com](http://www.festo.com)

Rotary knob with detent                      Rotary knob with detent, can be locked using accessories AS                      Rotary knob with integrated lock E11



2 Installation dimensions

Type	B1	D1	L1	L2	L3
MS9-LR	–	52	–	86	–
MS9-LR-...-AS	65	52	–	96	–
MS9-LR-...-E11	–	52	174	114	25

**Ordering data**

Integrated pressure gauge, display unit [bar], rotary knob with detent, can be locked using accessories

Size	Connection	Piloted diaphragm regulator		Directly actuated diaphragm regulator	
		Part No.	Type	Part No.	Type
Pressure regulation range 0.5 ... 4 bar, manually operated					
MS9	–	564134	MS9-LR-G-D5-AG-BAR-AS	564135	MS9-LR-G-D5-DI-AG-BAR-AS
Pressure regulation range 0.5 ... 7 bar, manually operated					
MS9	–	564136	MS9-LR-G-D6-AG-BAR-AS	564137	MS9-LR-G-D6-DI-AG-BAR-AS
Pressure regulation range 0.5 ... 12 bar, manually operated					
MS9	–	564138	MS9-LR-G-D7-AG-BAR-AS	–	–

# Pressure regulators MS9-LR, MS series

Ordering data – Modular products

Ordering table		Grid dimension	[mm]	90	Condi- tions	Code	Enter code
<b>M</b>	Module No.	<b>562530</b>					
	Series	Standard				<b>MS</b>	MS
	Size	9				<b>9</b>	9
	Function	Pressure regulator				<b>-LR</b>	-LR
	Pneumatic connection	Female thread G $\frac{3}{4}$			<b>1</b>	<b>-<math>\frac{3}{4}</math></b>	
		Female thread G1			<b>1</b>	<b>-1</b>	
		Connecting plate G $\frac{1}{2}$				<b>-AGD</b>	
		Connecting plate G $\frac{3}{4}$				<b>-AGE</b>	
		Connecting plate G1				<b>-AGF</b>	
		Connecting plate G1 $\frac{1}{4}$				<b>-AGG</b>	
		Connecting plate G1 $\frac{1}{2}$				<b>-AGH</b>	
		Module without connecting thread, without connecting plate			<b>1</b>	<b>-G</b>	
		Pressure regulation range/ operation	0.5 ... 4 bar, manually operated				<b>-D5</b>
	0.5 ... 7 bar, manually operated				<b>-D6</b>		
	0.5 ... 12 bar, manually operated				<b>-D7</b>		
	0.5 ... 16 bar, manually operated			<b>1</b>	<b>-D8</b>		
	Max. 16 bar, pneumatically actuated (pressure range defined by means of pilot regulator)			<b>2</b>	<b>-PO</b>		
<b>O</b>	Regulator type	Directly actuated			<b>3</b>	<b>-DI</b>	
<b>M</b>	Pressure gauge/pressure gauge alternatives	MS pressure gauge				<b>-AG</b>	
		Cover plate				<b>-VS</b>	
		Adapter plate for EN pressure gauge $\frac{1}{4}$ , without pressure gauge				<b>-A4</b>	
		Integrated pressure gauge, red/green scale			<b>4</b>	<b>-RG</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/O contact			<b>1</b> <b>5</b>	<b>-AD7</b>	
		Pressure sensor with operational status indicator, plug M8, threshold value comparator, PNP, N/C contact			<b>1</b> <b>5</b>	<b>-AD8</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/O contact			<b>1</b> <b>5</b>	<b>-AD9</b>	
		Pressure sensor with operational status indicator, plug M8, window comparator, PNP, N/C contact			<b>1</b> <b>5</b>	<b>-AD10</b>	
<b>↓</b>							

- 1**  $\frac{3}{4}$ , **1, G, D8, AD7, AD8, AD9, AD10, E11, WPM**  
Not with EU certification EX4
- 2** **PO**  
Not with regulator type DI  
Not with security AS, E11

- 3** **DI**  
Not with pressure regulation range D7, D8
- 4** **RG**  
Not with alternative pressure gauge scale PSI,  
PSI scale serves only as an auxiliary scale
- 5** **AD7 ... AD10**  
Measuring range max. 10 bar

- M** Mandatory data
- O** Options

Transfer order code

# Pressure regulators MS9-LR, MS series

Ordering data – Modular products

Ordering table				Condi- tions	Code	Enter code
Grid dimension	[mm]	90				
0 Alternative pressure gauge scale	psi		6	-PSI		
	MPa		6	-MPA		
	bar		6	-BAR		
Secondary venting	Without secondary venting		7	-OS		
Alternative mounting position	Rotary knob underneath (connection underneath with PO)			-KD		
Security	Lockable via accessories			-AS		
	With integrated lock		1	-E11		
Type of mounting	Mounting bracket standard design		8	-WP		
	Mounting bracket for attaching the service units		1 8	-WPM		
	Mounting bracket for large wall gap		8	-WPB		
EU certification	II 2GD to EU Directive 94/9/EG			-EX4		
UL certification	cULus, ordinary location for Canada and USA			-UL1		
Flow direction	Flow direction from right to left			-Z		

1 3/4, 1, G, D8, AD7, AD8, AD9, AD10, E11, WPM

Not with EU certification EX4

7 OS

Only with regulator type DI

8 WP, WPM, WPB

Not with pneumatic connection G

6 PSI, MPA, BAR

Not with pressure gauge alternatives VS, A4, AD7, AD8, AD9, AD10

M Mandatory data

O Options

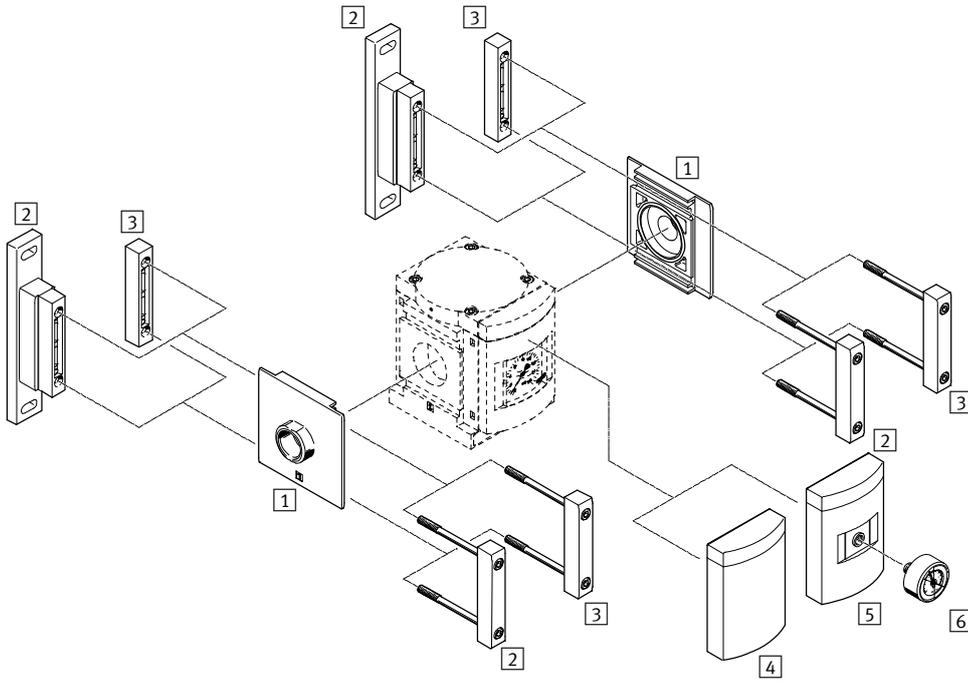
### Transfer order code

- [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

# Pressure regulators MS12-LR, MS series

Peripherals overview

## Pressure regulator MS12-LR

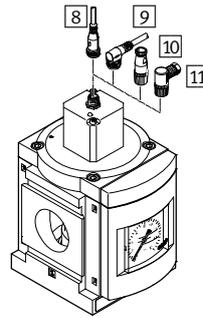
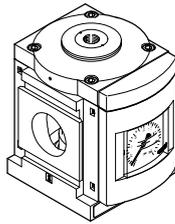
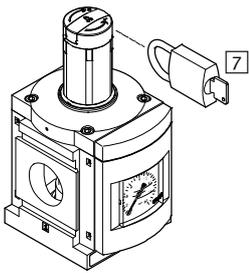


-  - Note  
 Additional accessories:  
 - Module connector  
 for combination with size MS9  
 → Internet: armv

manually operated

pneumatically actuated

solenoid actuated



## Pressure regulators MS12-LR, MS series

Peripherals overview

Mounting attachments and accessories		→ Page/Internet
1	Connecting plate-SET MS12-AG...	ms12-ag
2	Mounting bracket MS12-WP	ms12-wp
3	Module connector MS12-MV	ms12-mv
4	Cover plate VS	94
5	Adapter plate for EN pressure gauge 1/4 A4	94
6	Pressure gauge MA	95
7	Padlock LRVS-D	95
8	Connecting cable NEBU-M12G...-LE4	95
9	Connecting cable NEBU-M12W...-LE4	95
10	Sensor socket SIE-GD	95
11	Angled plug socket SIE-WD	95

# Pressure regulators MS12-LR, MS series

Type codes

MS 12 - LR - G - D7 - LD - AS

**Series**

MS	Standard service unit
----	-----------------------

**Size**

12	Grid dimension 124 mm
----	-----------------------

**Service function**

LR	Pressure regulator
----	--------------------

**Connection size**

G	Module without connecting thread, without connecting plate Connecting plates → Accessories
---	---

**Pressure regulation range/actuation mode**

D7	0.5 ... 12 bar, manually operated
PO	0.5 ... 16 bar, pneumatically actuated
PE6	0.15 ... 6 bar, solenoid actuated

**Rotary knob**

Pressure regulation range/actuation mode D7	
LD	Long rotary knob
Pressure regulation range/actuation mode PO/PE6	
	No rotary knob

**Security**

Pressure regulation range/actuation mode D7	
AS	Rotary knob with detent, lockable via accessories
Pressure regulation range/actuation mode PO/PE6	
	No rotary knob

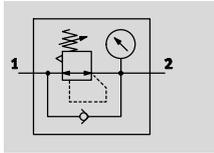
**Further variants can be ordered using the modular system → 94**

- Connecting plates
- Pressure regulation range/actuation mode
- Pressure gauge alternatives
- Alternative pressure gauge scale
- Security
- Type of mounting
- Flow direction

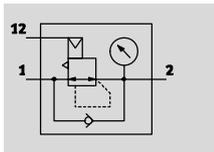
# Pressure regulators MS12-LR, MS series

Technical data

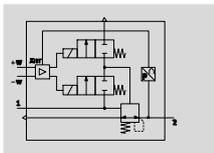
Pressure regulation range/actuation mode  
D6/D7/D8, manually operated



PO, pneumatically actuated



PE6, solenoid actuated



-  - Flow rate  
12,000 ... 22,000 l/min
-  - Temperature range  
-10 ... +60 °C
-  - Operating pressure  
0.8 ... 21 bar
-  - [www.festo.com](http://www.festo.com)

Wearing parts kits  
→ 93



The pressure regulator maintains an essentially constant output pressure p2 independent of pressure fluctuations in the system and air consumption. The output pressure p2 can be set within the pressure regulation range either manually using the rotary knob, pneumatically via a pilot

pressure p12 by an external pilot regulator or electrically via setpoint signals. When the operating pressure or the voltage for the setpoint signals is switched off, the output pressure p2 is vented via connection 3 (secondary venting).

- Good regulation characteristics with low hysteresis and primary pressure compensation
- High flow rate with minimal pressure drop
- Regulator lock for protecting the values against adjustment
- With secondary venting
- Pressure gauge connection for different fitting options

General technical data		
Pneumatic connection 1, 2	Connecting plate AG...	G1, G1¼, G1½ or G2
	Module without connecting thread/plate G	–
Pilot air connection 12 with pressure regulation range/actuation mode PO		G¼
Constructional design		Pressure regulator with/without pressure gauge
		Pilot actuated diaphragm regulator (except pressure regulation range/actuation mode PO)
		Diaphragm regulator (with pressure regulation range/actuation mode PO)
Regulating function		Output pressure constant, via primary pressure compensation, via return flow function, via secondary venting
Type of mounting		Via accessories
		In-line installation
Mounting position		Any
Regulator lock		Rotary knob with detent
		Rotary knob with detent, lockable via accessories
		Rotary knob with integrated lock
Pressure regulation range/operation	D6 [bar]	0.3 ... 7, manually operated
	D7 [bar]	0.5 ... 12, manually operated
	D8 [bar]	0.5 ... 16, manually operated
	PO [bar]	0.5 ... 16, pneumatically actuated <sup>1)</sup>
	PE6 [bar]	0.15 ... 6, solenoid actuated
Max. hysteresis	[bar]	0.4 with pressure regulation range/actuation mode D6/D7/D8/PO
	[bar]	0.04 with pressure regulation range/actuation mode PE6
Pressure display		Via pressure gauge

1) Output pressure p2 corresponds roughly to the applied pilot pressure p12.

- † - Note: This product conforms to ISO 1179-1 and to ISO 228-1

# Pressure regulators MS12-LR, MS series

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Technical data

Flow rates		
Pressure regulation range/ actuation mode	D6/D7/D8/PO <sup>1)</sup>	PE6 <sup>2)</sup>
Standard nominal flow rate $q_{nN}^{3)}$ [l/min]		
$q_{nN} 1 \rightarrow 2$	G1	13,000
	G1 <sup>3/4</sup>	13,500
	G1 <sup>1/2</sup>	16,000
	G2	22,000
Secondary venting flow rate [l/min]		
$q_n 2 \rightarrow 3$	≤ 600	≤ 600

1) Measured at  $p_1 = 10$  bar and  $p_2 = 6$  bar,  $\Delta p = 0.5$  bar

2) Measured at  $p_1 = 7$  bar and  $p_2 = 6$  bar,  $\Delta p = 0.5$  bar

3) Dependent on connecting plate selected, must be ordered separately as an accessory → Internet: ms12-ag

Electrical data (pressure regulation range/actuation mode PE6 only)		
Operating voltage range	[V DC]	21.6 ... 26.4
Nominal operating voltage	[V DC]	24
Residual ripple	[%]	10
Analogue input signal range	[V]	0 ... 10
Max. current consumption	[A]	0.15
Max. electrical power consumption	[W]	3.6
Protection class		IP65

Operating and environmental conditions		
Pressure regulation range/ actuation mode	D6/D7/D8/PO	PE6
Operating pressure	[bar]	0.8 ... 21
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Ambient temperature	[°C]	-10 ... +60
Temperature of medium	[°C]	-10 ... +60
Storage temperature	[°C]	-10 ... +60
Corrosion resistance class	CRC <sup>1)</sup>	2
CE mark (see declaration of conformity)	-	To EU EMC Directive

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

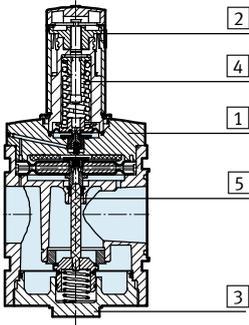
Weight [g]	
Pressure regulator	4,000
Pressure regulator with rotary knob with integrated lock E11	4,300

# Pressure regulators MS12-LR, MS series

Technical data

## Materials

Sectional view

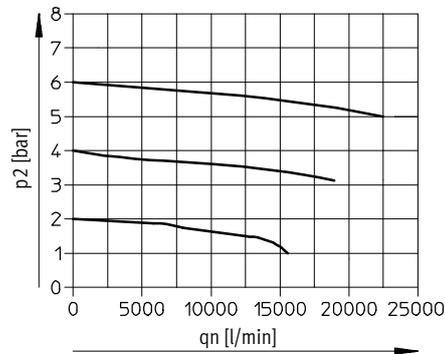


Pressure regulator		
1	Housing	Die-cast aluminium
2	Rotary knob	PA-reinforced, POM
	Rotary knob with integrated lock E11	Wrought aluminium alloy
3	Cap (bottom)	Wrought aluminium alloy
4	Spring	Spring steel
5	Valve stem	Wrought aluminium alloy, NBR, high alloy steel non-corrosive
-	Seals, diaphragm	NBR
	Note on materials	RoHS-compliant
		Free of copper and PTFE only with cover plate VS

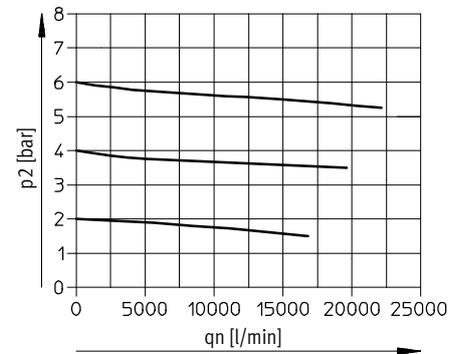
## Standard flow rate $q_n$ as a function of output pressure $p_2$ (MS12-LR...-D6/D7/D8/PO only)

With connecting plate MS12-AGF  
Pneumatic connection G1

Input pressure  $p_1 = 10$  bar

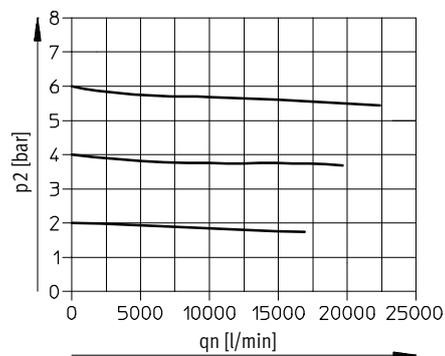


With connecting plate MS12-AGG  
Pneumatic connection G1¼

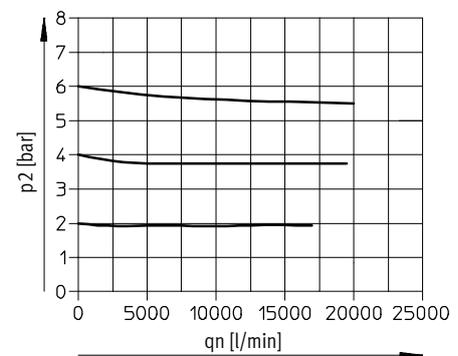


With connecting plate MS12-AGH  
Pneumatic connection G1½

Input pressure  $p_1 = 10$  bar



With connecting plate MS12-AGI  
Pneumatic connection G2



# Pressure regulators MS12-LR, MS series

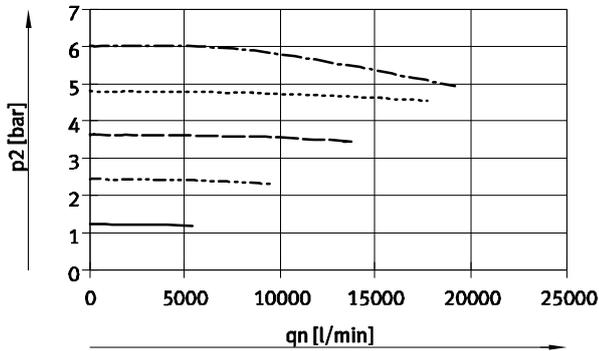
Technical data



## Standard flow rate $q_n$ as a function of output pressure $p_2$ (MS12-LR...-PE6 only)

With connecting plate MS12-AGH

Pneumatic connection G1½



Input pressure  $p_1 = 7$  bar

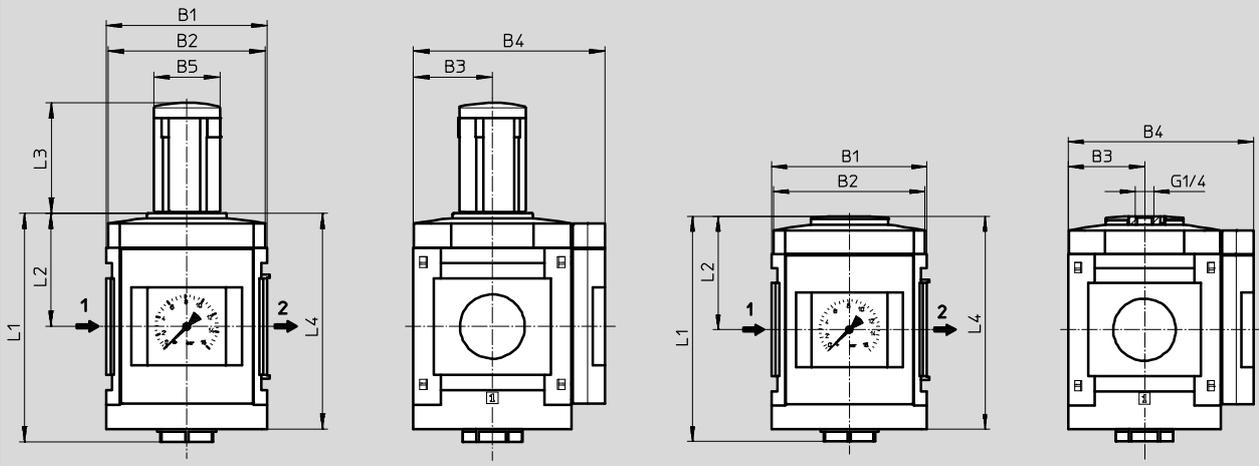
- 2 volts
- - - 4 volts
- · - 6 volts
- · · 8 volts
- - - - 10 volts

## Dimensions

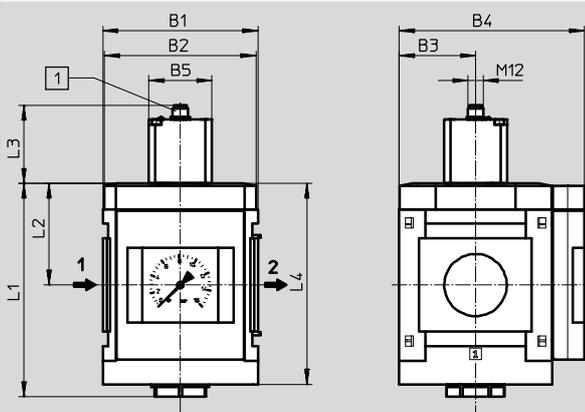
Download CAD data → [www.festo.com](http://www.festo.com)

Pressure regulation range/actuation mode D6/D7/D8, manually operated, integrated pressure gauge, display unit [bar], long rotary knob

Pressure regulation range/actuation mode PO, pneumatically actuated, integrated pressure gauge, display unit [bar]



Pressure regulation range/actuation mode PE6, solenoid actuated, integrated pressure gauge, display unit [bar]



- 1 Suitable for
- Connecting cable NEBU-M12G...-LE4/NEBU-M12W...-LE4
  - Sensor socket SIE-GD
  - Angled plug socket SIE-WD-TR

→ Flow direction

Type	B1	B2	B3	B4	B5	L1	L2	L3	L4
MS12-LR...-D6/D7/D8	124	122	61	148	52	178	88	86	168
MS12-LR...-PO					-	181	91	-	171
MS12-LR...-PE6					50	172	82	62.7	162

# Pressure regulators MS12-LR, MS series

Technical data

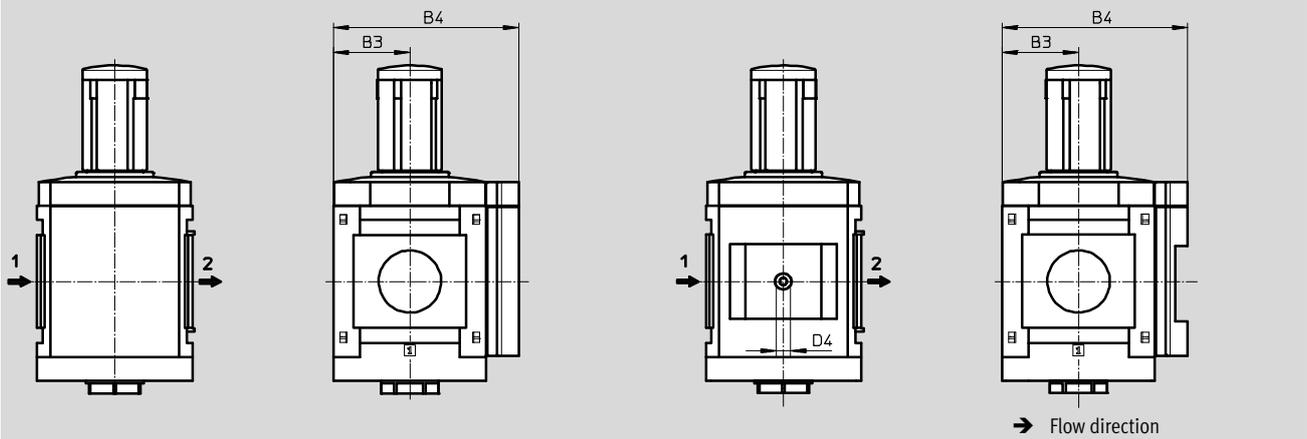
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## Dimensions – Pressure gauge alternatives

Download CAD data → [www.festo.com](http://www.festo.com)

Cover plate VS

Adapter plate A4 for EN pressure gauge 1/4, without pressure gauge



Type	B3	B4	D4
MS12-LR-...-VS	61	148	–
MS12-LR-...-A4	61	148	G1/4

–||– Note: This product conforms to ISO 1179-1 and to ISO 228-1

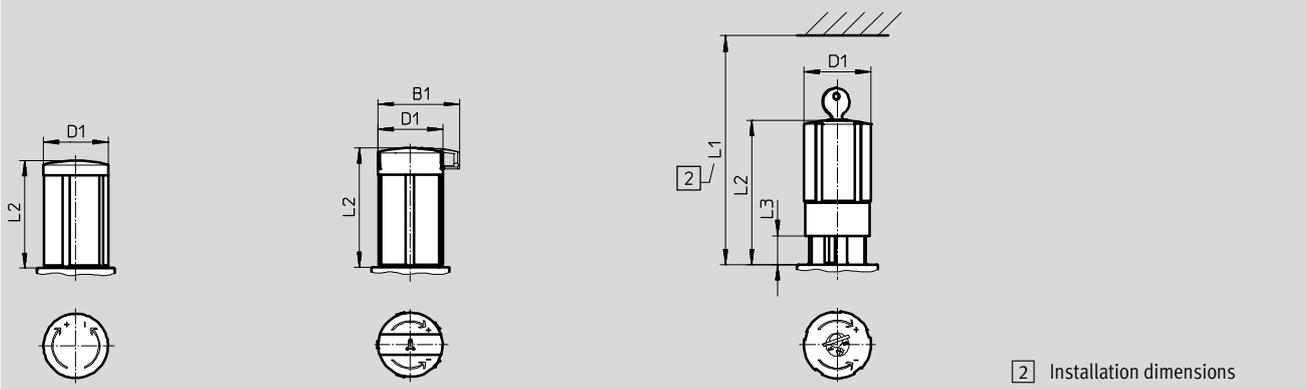
## Dimensions – Rotary knob

Download CAD data → [www.festo.com](http://www.festo.com)

Long rotary knob with detent LD

Long rotary knob with detent,  
lockable via accessories LD-AS

Rotary knob with integrated lock  
E11



Type	B1	D1	L1	L2	L3
MS12-LR-...-LD	–	52	–	86	–
MS12-LR-...-LD-AS	65	52	–	96	–
MS12-LR-...-E11	–	52	174	114	25

## Ordering data

Integrated pressure gauge, display unit [bar]

Size	Connection	Pressure regulation range 0.5 ... 12 bar, manually actuated, long rotary knob with detent, lock- able via accessories		Pressure regulation range 0.5 ... 16 bar, pneumatically actuated		Pressure regulation range 0.15 ... 6 bar, solenoid actuated	
		Part No.	Type	Part No.	Type	Part No.	Type
MS12	G1 ... G2 <sup>1)</sup>	537148	MS12-LR-G-D7-LD-AS	541680	MS12-LR-G-PO	564888	MS12-LR-G-PE6

1) Connecting plate must be ordered separately as an accessory → Internet: ms12-ag

–||– Note: This product conforms to ISO 1179-1 and to ISO 228-1

## Ordering data – Wearing parts kits

Size	Part No.	Type
MS12	673586	MS12-LR/LFR



# Pressure regulators MS-LR/LRB/LRP/LRPB/LRE, MS series

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Accessories

Ordering data – Pressure gauge MA					
	Nominal size	Pneumatic connection	Indicating range		Part No. Type
			[bar]	[psi]	
	Pressure gauge MA, EN 837-1 <span style="float: right;">Technical data → Internet: ma</span>				
	40	R $\frac{1}{4}$	0 ... 16	0 ... 232	<b>187080</b> MA-40-16-R $\frac{1}{4}$ -EN
		G $\frac{1}{4}$	0 ... 16	0 ... 232	<b>183901</b> MA-40-16-G $\frac{1}{4}$ -EN
	Pressure gauge MA, EN 837-1, with red/green range <span style="float: right;">Technical data → Internet: ma</span>				
40	R $\frac{1}{8}$	0 ... 16	–	<b>525726</b> MA-40-16-R $\frac{1}{8}$ -E-RG	
50	R $\frac{1}{4}$	0 ... 16	–	<b>525729</b> MA-50-16-R $\frac{1}{4}$ -E-RG	
Precision pressure gauge MAP, EN 837-1 <span style="float: right;">Technical data → Internet: map</span>					
40	R $\frac{1}{8}$	0 ... 1	0 ... 15	<b>161126</b> MAP-40-1- $\frac{1}{8}$ -EN	
		0 ... 4	0 ... 58	<b>162842</b> MAP-40-4- $\frac{1}{8}$ -EN	
		0 ... 6	0 ... 87	<b>161127</b> MAP-40-6- $\frac{1}{8}$ -EN	
		0 ... 16	0 ... 232	<b>161128</b> MAP-40-16- $\frac{1}{8}$ -EN	

Ordering data – Connecting cable NEBU-M8				Technical data → Internet: nebu	
	Electrical connection	Number of wires	Cable length [m]	Part No.	Type
	M8x1, straight socket	3	2.5	<b>541333</b>	NEBU-M8G3-K-2.5-LE3
			5	<b>541334</b>	NEBU-M8G3-K-5-LE3
	M8x1, angled socket	3	2.5	<b>541338</b>	NEBU-M8W3-K-2.5-LE3
			5	<b>541341</b>	NEBU-M8W3-K-5-LE3

Ordering data – Connecting cable NEBU-M12				Technical data → Internet: nebu	
	Electrical connection	Number of wires	Cable length [m]	Part No.	Type
	M12x1, straight socket	4	2.5	<b>550326</b>	NEBU-M12G5-K-2.5-LE4
			5	<b>541328</b>	NEBU-M12G5-K-5-LE4
		5	2.5	<b>541330</b>	NEBU-M12G5-K-2.5-LE5
			5	<b>541331</b>	NEBU-M12G5-K-5-LE5
	M12x1, angled socket	4	2.5	<b>550325</b>	NEBU-M12W5-K-2.5-LE4
			5	<b>541329</b>	NEBU-M12W5-K-5-LE4

Ordering data – Sensor socket SIE-GD		Technical data → Internet: sie-gd	
	Electrical connection	Part No.	Type
	M12x1, 4-pin	<b>18494</b>	SIE-GD

Ordering data – Angled plug socket SIE-WD		Technical data → Internet: sie-wd	
	Electrical connection	Part No.	Type
	M12x1, 4-pin	<b>12956</b>	SIE-WD-TR

Ordering data – Padlock LRVS-D		Part No.	Type
	Weight [g]		
	120	<b>193786</b>	LRVS-D

# Medical Sterile Filters

Models | A3021MS to A3303MS

Flow Rates 15 SCFM (25 Nm<sup>3</sup>/hr) to 1500 SCFM (2550 Nm<sup>3</sup>/hr)

When it comes to patient care, quality and reliability of compressed air is paramount. Walker Filtration's range of New Alpha Medical Sterile Filters guarantees reliable and outstanding air purity that meets internationally certified medical performance levels.

100% integrity tested, New Alpha Medical Sterile elements are guaranteed for a minimum of 100 sterilizations at 248°F (120°C), ensuring your compressed air is free from live bacteria and other submicron particles.



#### Stainless Steel End Caps

Specially designed for autoclave sterilization compatibility



#### 100% Integrity Tested

Each element is supplied with an Air Sterilization Certificate to guarantee the highest quality to our customers



#### Product Safety in Mind

Lock indication arrows assure effective sealing

- **International Validation** Designed to exceed the requirements of HTM 02-01 medical gas pipeline systems
- **Simplified Serviceability** Ribbed bowl design and unique push fit elements ensure quick and reliable maintenance
- **Product Safety in Mind** Guaranteed safe housing closure with rotational safety stop
- **Corrosion Protection** Internal and external electrophoretic paint finish followed by a tough polyester powder coating
- **Flexible Installation** Modular design and accessible fixings enable simple close coupling assembly
- **Robust and Sterilizable Materials** Manufactured from cast aluminum alloy for enhanced strength and protection

For further information please visit [www.walkerfiltration.com](http://www.walkerfiltration.com)



Designed to exceed the requirements of HTM 02-01 Technical Memorandum



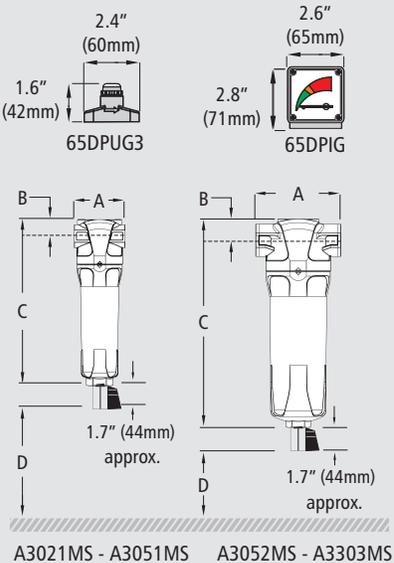
For further information please call: +1 814 836 2900



# Technical Specification

Filter model	Pipe size inches	Inlet flow rate*		Dimensions inches (mm)				Weight		Element model
		SCFM	Nm <sup>3</sup> /hr	A	B	C	D	lbs	kg	
A3021MS	¼	15	25	1.97 (50)	0.67 (17)	618 (157)	2.36 (60)	0.6	0.25	E30306SR
A3022MS	¼	25	42	2.76 (70)	0.94 (24)	9.09 (231)	2.76 (70)	1.3	0.6	E30408SR
A3031MS	¾	32	54	2.76 (70)	0.94 (24)	9.09 (231)	2.76 (70)	1.3	0.6	E30408SR
A3051MS	½	50	85	2.76 (70)	0.94 (24)	9.09 (231)	2.76 (70)	1.3	0.6	E30412SR
A3052MS	½	70	119	5.00 (127)	1.26 (32)	11.22 (285)	3.15 (80)	3.7	1.7	E30612SR
A3071MS	¾	85	144	5.00 (127)	1.26 (32)	11.22 (285)	3.15 (80)	3.7	1.7	E30612SR
A3102MS	1	175	297	5.00 (127)	1.26 (32)	14.61 (371)	3.15 (80)	4.4	2	E30621SR
A3122MS	1¼	280	476	6.69 (170)	2.09 (53)	20.00 (508)	3.94 (100)	10.8	4.9	E30831SR
A3151MS	1½	400	680	6.69 (170)	2.09 (53)	20.00 (508)	3.94 (100)	10.8	4.9	E30831SR
A3201MS	2	450	765	6.69 (170)	2.09 (53)	20.00 (508)	3.94 (100)	10.8	4.9	E30831SR
A3202MS	2	700	1189	6.69 (170)	2.09 (53)	27.87 (708)	3.94 (100)	12.1	5.5	E30850SR
A3251MS	2½	850	1444	8.66 (220)	2.76 (70)	28.98 (736)	3.94 (100)	23.1	10.5	E31140SR
A3301MS	3	900	1529	8.66 (220)	2.76 (70)	28.98 (736)	3.94 (100)	23.1	10.5	E31140SR
A3302MS	3	1250	2125	8.66 (220)	2.76 (70)	33.74 (857)	3.94 (100)	25.4	11.5	E31160SR
A3303MS	3	1500	2550	8.66 (220)	2.76 (70)	39.57 (1005)	3.94 (100)	27.6	12.5	E31175SR

\*Rated flow at 100 psig (7 barg), reference conditions at 14.5 psi (a) (1 bar (a)) 68°F (20°C)



Grade	SR	
DOP efficiency**	>99.9999%	
Particle removal	0.01 micron	
Maximum operating temperature	248°F	120°C
Recommended operating temperature	122°F	50°C
Maximum autoclave temperature	273°F	134°C
Pressure Loss - clean & dry	1.5 psi	100 mbar
Maximum working pressure	300 psig	20.7 barg
Element end cap material	Stainless steel	

\*\*As specified in HTM 02-01 medical gas pipeline systems

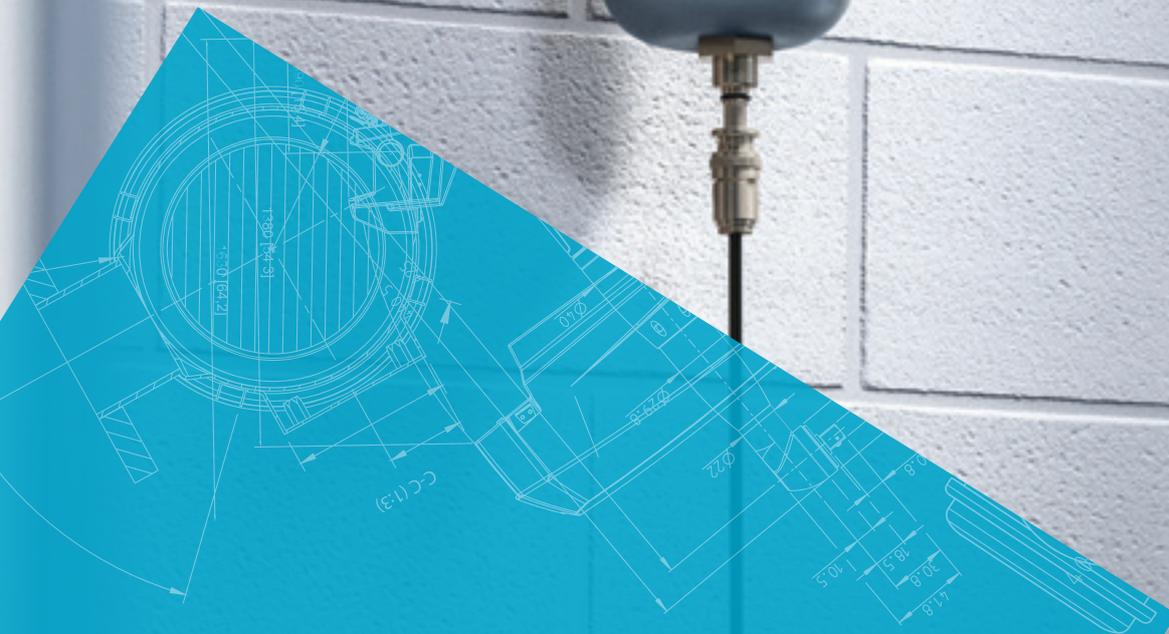
Pressure correction factors	For maximum flow rate, multiply model flow rate by the correction factor corresponding to the minimum operating pressure									
Operating pressure psig (barg)	58 (4)	72 (5)	87 (6)	100 (7)	115 (8)	145 (10)	174 (12)	203 (14)	232 (16)	290 (20)
100 psig correction factor	0.76	0.84	0.92	1.00	1.07	1.19	1.31	1.41	1.51	1.60

## Technical notes

- Filter element End Caps are stainless steel.
- Direction of air flow is outside to in through the filter element.
- Pop up indicators (65DPUG3) are fitted to models A3022 to A3051 as standard. Differential pressure indicators (65DPiG) are fitted to models A3052 to A3303 as standard.
- Manual drain valves (MDV25 on models A3021MS to 3051MS and MDVE25 on models A3052MS to A3303MS) are fitted as standard.
- Medical Sterile Filter elements must not operate in water or oil saturated conditions.
- Maximum steam sterilizing temperature refers to the filter element ONLY. Grade SR filter elements can be steam sterilized 100 times. Each element must be autoclaved before commencement of duty.
- Pre-filtration should be used in conjunction with 0.01 micron sterile filters.
- Threaded filters are manufactured from cast aluminum alloy and are PED 2014/68/EU compliant for group 2 gases.
- Standard threaded connections are NPT to ANSI/ASME B1.20.1. RP (BSP Parallel) to ISO 7-1 and RC (BSP Taper) to ISO 7-1 are also available upon request.
- Filter elements should be changed at least every 6 months or every 100 sterilizations, whichever comes first.
- Filters are suitable for use in dry air conditions only, as any liquids passing through the filter could carry bacteria and compromise sterility



Atlas Copco



Compressed air filters



## COMMITTED TO SUPERIOR PRODUCTIVITY

### **In-house development & testing**

Since 1998, our dedicated filtration team is responsible for in-house development of cutting-edge filtration solutions. This results in expert know-how of filtration mechanisms, state-of-the-art test facilities and breakthrough innovations. For many years, our filtration team has cooperated closely with the University of Karlsruhe, a leading institute in research of filtration mechanisms.

### **Rigorous quality control**

To ensure the highest standards, all Atlas Copco products are subjected to rigorous quality control testing. The entire filter range is produced in-house, on the most advanced production lines, using the most stringent methods in the industry. You can rest assured at all times that strict certification and testing procedures are conducted to ensure our filtration products meet the highest standards.

# THE ATLAS COPCO SOLUTION

Compressed air can be contaminated by dirt, water and oil, which can be further divided as follows:

- **DIRT:** micro-organisms, dust, solid particles, rust particles.
- **WATER:** water vapor, condensed liquid water, water aerosols, acidic condensates.
- **OIL:** liquid oil, oil aerosol, hydrocarbon vapor.

Atlas Copco offers a wide selection of filtration solutions and application knowledge. Different product types and grades are available to meet your every demand. Only genuine spare cartridges guarantee the Atlas Copco filter performance.



## Welded design

6 grades  
12 sizes  
550 → 8,000 l/s  
1,200 → 17,000 cfm

## Tower design

1 grade  
14 sizes  
20 → 1800 l/s  
42 → 3814 cfm

20 bar / 290 psi  
50 bar / 725 psi  
100 bar / 1,450 psi  
350 bar / 5,075 psi

## Threaded design

5 grades  
9 sizes  
15 → 944 l/s  
32 → 2,000 cfm

## Threaded design

5 grades  
11 sizes  
9 → 520 l/s  
19 → 1,102 cfm

## Threaded design

1grade  
10 sizes  
400 → 6,700 l/min  
14 → 237 cfm



## Cast design

6 grades  
13 sizes  
9 → 550 l/s  
19 → 1,200 cfm



850 → 1,100 l/s  
1,801 → 2,331 cfm



Name	DDp+	PDp+	DD+	PD+	UD+	QD+	QDT	H High pressure	SFA Silicone-free	MV Medical vacuum				
	DDp	PDp	DD	PD		QD								
Grade	Rough	Fine	Rough	Fine	Ultimate	Basic	Optimal	Rough & Fine	Rough & Fine	Basic	Rough & Fine	Rough & Fine	Basic	Fine
	Dry dust		Oil aerosol / wet dust			Oil vapor								
Contaminant	General applications							Special applications						



Dry dust



Micro-organisms



Oil aerosol



Wet dust



Oil vapor



Water drops

# CERTIFIED PERFORMANCE

Atlas Copco filters are qualified according to the ISO 8573-1:2010 standard. This is the latest edition of the standard. Beware of filters that comply with earlier editions, such as ISO 8573-1:1991 or ISO 8573-1:2001. The difference is inferior quality of the delivered compressed air. This qualification is a result of our filters being tested according to ISO 12500-1:2007, ISO 12500-2:2007, and ISO 12500-3:2009. These specify the test layout, test procedures and inlet conditions required for testing coalescing filters, vapor filters, and solid particle filters used in compressed air systems, to determine their effectiveness in removing oil aerosol, oil vapor and solid particles. The measurements of the air purity downstream the filter for each specific contaminant have been performed according to the test methods described in respectively ISO 8573-2:2007, ISO 8573-5:2001 and ISO 8573-4:2001. Tests have been conducted in-house as well as in external labs, and are independently validated by TÜV.

## ISO certification

Atlas Copco's filters have been fully tested and qualified according to the following ISO standards:

- ISO 8573-1:2010: Compressed air - Contaminants and purity classes
- ISO 8573-2:2007: Compressed air - Test method for oil aerosol content
- ISO 8573-4:2001: Compressed air - Test method for dust
- ISO 8573-5: 2001: Compressed air - Test method for oil vapor and organic solvent content
- ISO 12500-1:2007: Filters for compressed air - test methods - oil aerosols
- ISO 12500-2:2007: Filters for compressed air - test methods - oil vapors
- ISO 12500-3:2009: Filters for compressed air - test methods - particulates



## Certified peace of mind

<b>FILTER APPROVALS</b>	<b>COMPANY CERTIFICATION</b>
CE ASME CRN	® ® ®
<b>ACTIVE MEMBER OF</b>	
pneurop CAGI bcas VDMA	

# A SOLUTION FOR EVERY APPLICATION

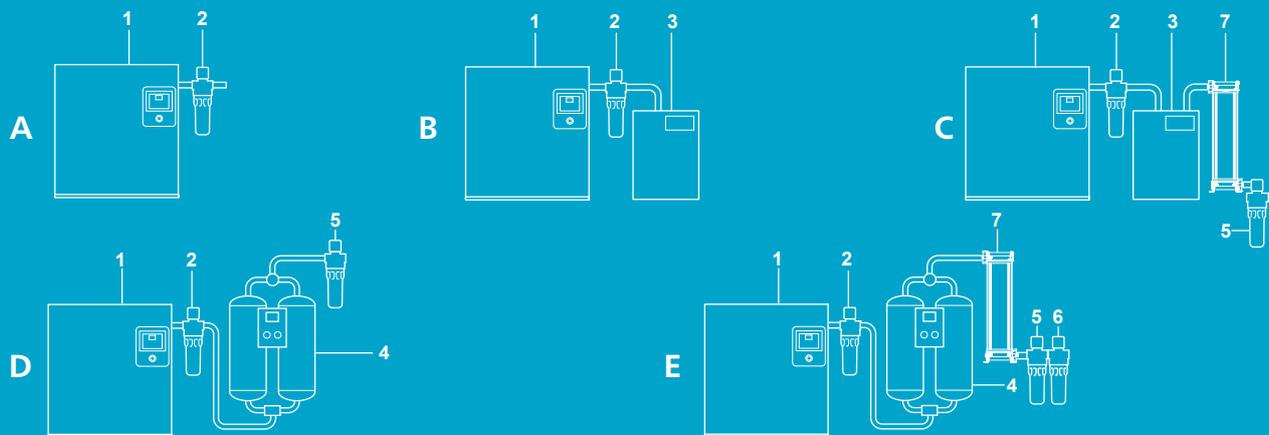
At different points of use, different compressed air purities might be needed, depending on the application. The various air purity classes are provided in the table below, which clearly shows the various Atlas Copco filters and dryers that meet all the different classes.

ISO 8573-1:2010 CLASS	Solid particles		Water	Oil (= aerosol, liquid, vapor)
	Wet conditions	Dry conditions		
0	As specified by the customer*			Oil-free compressor
1	DD+ & PD+	DDp+ & PDp+	Desiccant dryer	DD+ & PD+ & QD+/QDT
	UD+			UD+ & QD+/QDT
2	DD+	DDp+	Desiccant dryer	DD+ & PD+ UD+
3	DD+	DDp+	Desiccant dryer, membrane dryer, rotary drum dryer	DD+
4	DD+	DDp+	Membrane dryer, refrigerant dryer	DD+
5	DD+	DDp+	Membrane dryer, refrigerant dryer	-
6	-	-	Membrane dryer, refrigerant dryer	-

\* Please contact your Atlas Copco sales representative.

## Examples of typical installations

<b>A</b>	Compressor - UD+	Air purity class ISO 8573-1:2010 [1:-:2]
<b>B</b>	Compressor - UD+ - Refrigerant dryer	Air purity class ISO 8573-1:2010 [1:4:2]*
<b>C</b>	Compressor - UD+ - Refrigerant dryer - QDT - DDp+	Air purity class ISO 8573-1:2010 [2:4:1]
<b>D</b>	Compressor - UD+ - Desiccant dryer - DDp+	Air purity class ISO 8573-1:2010 [2:2:2]
<b>E</b>	Compressor - UD+ - Desiccant dryer - QDT - DDp+ - PDp+	Air purity class ISO 8573-1:2010 [1:2:1]



**1.** Compressor  
**2.** UD+ filter

**3.** Refrigerant dryer  
**4.** Desiccant dryer

**5.** DDp+ filter  
**6.** PDp+ filter

**7.** QDT filter

\* Particle class 1 is reached directly after UD+. As downstream piping & vessels can add particles, it is advised to install particle filters DDp+ and PDp+ just before the application to reach particle class 1 at point of use.

The compressor should be equipped with a liquid water separation system such as an after cooler including a drain or a water separator (WSD). Always install a water separator in front of a coalescence filter. In case of critical applications, install extra air treatment products at point of use for the removal of pipeline contamination and condensation.

# UD+ SERIES

## Two-in-one oil coalescing filters with supreme energy savings

UD+ filters efficiently reduce oil aerosol, wet dust and water drops in your compressed air stream to protect your investment, equipment and processes. The UD+ combines two filtration steps (DD+ and PD+) into one, a unique technology to meet the high-quality requirements of diverse applications and provide ultimate energy savings.



## YOUR BENEFITS

### 40% energy savings

A 40% lower pressure drop than the conventional filter combination results in 40% higher energy efficiency.

### Pure air

Air purity is equal to that obtained using two filters in line, thanks to the thick filter package of UD+ filters.

### Save space

The two-in-one filtration concept reduces installation space and complexity, making UD+ filters particularly suitable for applications where space is at a premium.

### Save money

Install UD+ filters to enjoy significant cost savings compared to conventional filters.

## Performance

	UD+
Contaminant	Oil aerosol/wet dust
Test method	ISO 8573-2:2007, ISO 12500-1:2007
Maximum oil carry-over (mg/m <sup>3</sup> )*	0.0009
Wet pressure drop (mbar)	245
Element service	After 4,000 operating hours or 1 year
Precede with	Water separation

\* Inlet oil concentration = 10 mg/m<sup>3</sup>. Oil = oil aerosol and liquid.

## Sizing & dimensions

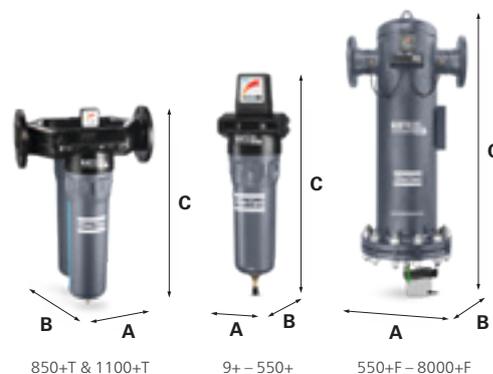
FILTER SIZE UD+	Nominal capacity		Reference pressure		Maximum pressure		Connections	Dimensions						Free space for cartridge replacement		Weight	
								A		B		C		D			
	l/s	cfm	bar(e)	psig	bar(e)	psig	in	mm	in	mm	in	mm	in	mm	in	kg	lbs
9+	9	19	7	102	16	232	3/8	90	3.5	61	2.4	268	10.6	75	2.9	1.0	2.2
15+	15	32	7	102	16	232	1/2	90	3.5	61	2.4	268	10.6	75	2.9	1.1	2.4
25+	25	53	7	102	16	232	1/2	90	3.5	61	2.4	323	12.8	75	2.9	1.3	2.9
45+	45	95	7	102	16	232	3/4 & 1	110	4.3	99	3.9	374	14.7	75	2.9	1.6	4.2
60+	60	127	7	102	16	232	1	110	4.3	99	3.9	414	16.3	75	2.9	2.1	4.6
100+	100	212	7	102	16	232	1	140	5.5	105	4.0	425	16.7	100	3.9	3.7	8.2
140+	140	297	7	102	16	232	1-1/2	140	5.5	105	4.1	520	20.5	100	3.9	4.2	9.3
180+	180	381	7	102	16	232	1-1/2	140	5.5	105	4.1	603	23.7	100	3.9	4.5	9.9
220+	220	466	7	102	16	232	1-1/2	140	5.5	105	4.1	603	23.7	100	3.9	4.6	10.1
310+	310	657	7	102	16	232	2 & 2-1/2	179	7.1	121	4.8	689	27.1	150	5.9	6.9	15.2
425+	425	901	7	102	16	232	3	210	8.3	128	5.1	791	31.1	200	7.9	11.0	24.2
550+	550	1165	7	102	16	232	3	210	8.3	128	5.1	961	37.8	200	7.9	12.6	27.8
550+F	550	1165	7	102	16	232	DN80	370	14.6	280	11.0	1295	51.0	1375	54.1	76.0	167.6
850+T	850	1.801	7	102	16	232	DN100	510	20.1	418	16.5	796	31.3	200	7.9	35.2	77.6
850+F	850	1801	7	102	16	232	DN100	510	20.1	410	16.1	1360	53.5	1500	59.1	141.0	310.9
1100+T	1.100	2.331	7	102	16	232	DN100	510	20.1	418	16.5	966	38.0	200	7.9	37.4	82.4
1100+F	1100	2331	7	102	16	232	DN100	510	20.1	410	16.1	1360	53.5	1500	59.1	143.0	315.3
1400+F	1400	2967	7	102	16	232	DN150	620	24.4	485	19.1	1480	58.3	1560	61.4	210.0	463.0
1800+F	1800	3814	7	102	16	232	DN150	640	25.2	490	19.3	1555	61.2	1640	64.6	176.0	388.0
2200+F	2200	4662	7	102	16	232	DN150	640	25.2	490	19.3	1555	61.2	1640	64.6	178.0	392.4
3000+F	3000	6357	7	102	16	232	DN200	820	32.3	650	17.7	1745	68.7	1710	67.3	420.0	925.9
4000+F	4000	8476	7	102	16	232	DN200	820	32.3	650	17.7	1745	68.7	1710	67.3	428.0	943.6
5000+F	5000	10595	7	102	16	232	DN200	820	32.3	650	17.7	1745	68.7	1710	67.3	432.0	952.4
6000+F	6000	12714	7	102	16	232	DN250	920	36.2	815	32.1	2085	82.1	1625	64.0	671.0	1479.3
7000+F	7000	14833	7	102	16	232	DN250	920	36.2	815	32.1	2085	82.1	1625	64.0	675.0	1488.1
8000+F	8000	16952	7	102	16	232	DN300	1040	40.9	930	36.6	2070	81.5	1625	64.0	900.0	1984.2

## Correction factors

Inlet pressure (bar)	1	2	3	4	5	6	7	8	10	12	14	16
Inlet pressure (psig)	15	29	44	58	72.5	87	102	116	145	174	203	232
Correction factor	0.38	0.53	0.65	0.75	0.83	0.92	1.00	1.06	1.20	1.31	1.41	1.50

### Example

- Working pressure 3 bar(g), compressed air flow 35 l/s.
- Multiply the nominal capacity of the selected filter with the corresponding correction factor at the required working pressure to obtain the capacity at working pressure:
  - Size 45+: 45 l/s \* 0.65 = 29 l/s => the 45+ filter size is not large enough.
  - Size 60+: 60 l/s \* 0.65 = 39 l/s => the 60+ filter size is the size to select.



## Options

- Filter connection kit for easy mounting in series (9-550 l/s).
- Wall mounting kit simplifies installation (9-550 l/s).
- Quick coupling connects the filter with a drain or oil/water separator.
- Voltage-free contact mounted in the differential pressure gauge, to give remote indication of cartridge replacement.
- EWD electronic drain with no loss of compressed air and an alarm function (EWD is optional on size 9+ - 550+, 850+T and 1100+T; standard on size 550+F and larger).

## Certification

- ISO 8573-2:2007
- ISO 12500-1:2007



# DD(+)/PD(+) SERIES

## High performance oil coalescing filters

DD(+) and PD(+) filters efficiently reduce oil aerosol, wet dust and water drops in your compressed air stream. These could come from the lubrication of the compressor element, the intake air, and the compressor installation itself. These innovative filtration solutions are engineered to cost-effectively provide the best air purity and meet today's increasing quality demands.



## YOUR BENEFITS

### Maximum oil aerosol, wet dust and water droplet filtration and drainage

High-efficient glass fiber and foam media.

### Significant energy savings & limited system operating costs

Optimal design and filter media allow low pressure losses.

### High reliability

High-performance stainless steel cores, double O-rings, epoxy sealed caps, and anti-corrosive coated filter housing.

### Easy maintenance

External ribs on the threaded housing, or a rotating bottom cover for the welded housings, and push-on elements.

### Monitoring of energy use

Differential pressure indication (indicator for sizes 10-35 l/s, gauge for sizes 50-8000 l/s) (optional for standard range).

## Performance

	DD	PD	DD+	PD+
Contaminant	Oil aerosol/wet dust			
Test method	ISO 8573-2:2007, ISO 12500-1:2007			
Maximum oil carry-over (mg/m <sup>3</sup> )*	0.1*	0.01*	0.07*	0.008*
Wet pressure drop (mbar)	245	280	180	215
Element service	After 4,000 operating hours or 1 year			
Precede with	Water separation	Water separation DD	Water separation	Water separation DD+

\* Inlet oil concentration = 10 mg/m<sup>3</sup>. Oil = oil aerosol and liquid.

## Sizing & dimensions

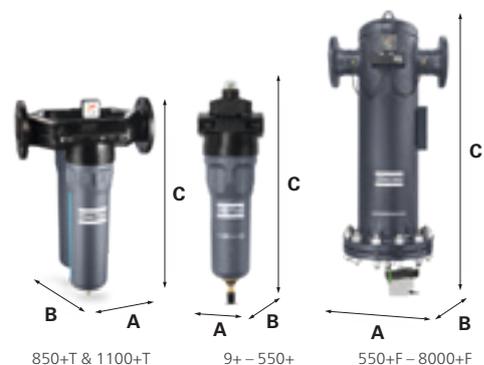
FILTER SIZE DD/PD		Nominal capacity				Reference pressure		Maximum pressure		Connections	Dimensions						Free space for cartridge replacement		Weight	
		Standard		+							A		B		C		D			
Standard	+	l/s	cfm	l/s	cfm	bar(e)	psig	bar(e)	psig	in	mm	in	mm	in	mm	in	mm	in	kg	lbs
12	10+	12	25	10	21	7	102	16	232	3/8	90	3.5	61	2.4	268	10.6	75	2.9	1.0	2.2
25	20+	25	53	20	42	7	102	16	232	1/2	90	3.5	61	2.4	268	10.6	75	2.9	1.1	2.4
45	35+	45	95	35	74	7	102	16	232	1/2	90	3.5	61	2.4	323	12.7	75	2.9	1.3	2.9
65	50+	65	138	50	106	7	102	16	232	3/4 & 1	110	4.3	99	3.9	374	14.7	75	2.9	1.6	4.2
90	70+	90	191	70	148	7	102	16	232	1	110	4.3	99	3.9	414	16.3	75	2.9	2.1	4.6
160	130+	160	339	130	275	7	102	16	232	1-1/2	140	5.5	105	4.1	520	20.5	100	3.9	4.2	9.3
215	170+	215	456	170	360	7	102	16	232	1-1/2	140	5.5	105	4.1	603	23.7	100	3.9	4.5	9.9
265	210+	265	562	210	445	7	102	16	232	1-1/2	140	5.5	105	4.1	603	23.7	100	3.9	4.6	10.1
360	310+	360	763	310	657	7	102	16	232	2 & 2-1/2	179	7.0	121	4.8	689	27.1	150	5.9	6.9	15.2
525	425+	525	1112	425	901	7	102	16	232	3	210	8.3	128	5.0	791	31.1	200	7.9	11.0	24.2
690	550+	690	1462	550	1165	7	102	16	232	3	210	8.3	128	5.0	961	37.9	200	7.9	12.6	27.8
630F	550+F	630	1335	550	1165	7	102	16	232	DN80	370	14.6	280	11	1295	51.0	1375	54.1	76.0	167.6
-	850+T	-	-	850	1801	7	102	16	232	DN100	510	20.1	418	16.5	796	31.3	200	7.9	35.2	77.6
970F	850+F	970	2055	850	1801	7	102	16	232	DN100	510	20.1	410	16.1	1360	53.5	1500	59.1	141.0	310.9
-	1100+T	-	-	1100	2331	7	102	16	232	DN100	510	20.1	418	16.5	966	38.0	200	7.9	37.4	82.4
1260F	1100+F	1260	2670	1100	2331	7	102	16	232	DN100	510	20.1	410	16.1	1360	53.5	1500	59.1	143.0	415.3
1600F	1400+F	1600	3390	1400	2967	7	102	16	232	DN150	620	24.4	485	19.1	1480	58.3	1560	61.4	210.0	463.0
2200F	1800+F	2200	4662	1800	3814	7	102	16	232	DN150	640	25.2	490	19.3	1555	61.2	1640	64.6	176.0	388.0
2400F	2200+F	2400	5086	2200	4662	7	102	16	232	DN150	640	25.2	490	19.3	1555	61.2	1640	64.6	178.0	392.4
3600F	3000+F	3600	7628	3000	6357	7	102	16	232	DN200	820	32.3	650	25.6	1745	68.7	1710	67.3	420.0	925.9
-	4000+F	-	-	4000	8476	7	102	16	232	DN200	820	32.3	650	25.6	1745	68.7	1710	67.3	428.0	943.6
-	5000+F	-	-	5000	10595	7	102	16	232	DN200	820	32.3	650	25.6	1745	68.7	1710	67.3	432.0	952.4
-	6000+F	-	-	6000	12714	7	102	16	232	DN250	920	32.3	815	32.1	2085	80.3	1625	64	671.0	1479.3
-	7000+F	-	-	7000	14833	7	102	16	232	DN250	920	36.2	815	32.1	2085	82.1	1625	64	675.0	1488.1
-	8000+F	-	-	8000	16952	7	102	16	232	DN300	1040	40.9	930	36.6	2070	81.5	1625	64	900.0	1984.2

## Correction factors

Inlet pressure (bar)	1	2	3	4	5	6	7	8	10	12	14	16
Inlet pressure (psig)	15	29	44	58	72.5	87	102	116	145	174	203	232
Correction factor	0.38	0.53	0.65	0.75	0.83	0.92	1.00	1.06	1.20	1.31	1.41	1.50

### Example

- Working pressure 3 bar(g), compressed air flow 35 l/s.
- Multiply the nominal capacity of the selected filter with the corresponding correction factor at the required working pressure to obtain the capacity at working pressure:
  - Size 50+: 50 l/s \* 0.65 = 33 l/s => the 50+ filter size is not large enough.
  - Size 70+: 70 l/s \* 0.65 = 46 l/s => the 70+ filter size is the size to select.



## Options

- Filter connection kit for easy mounting in series (10+ - 550+ l/s and 12-690 l/s).
- Wall-mounting kit simplifies installation (10+ - 550+ l/s and 12-690 l/s).
- Quick coupling connects the filter with a drain or oil/water separator.
- Voltage-free contact mounted in the differential pressure gauge, to give remote indication of cartridge replacement.
- EWD electronic drain with no loss of compressed air and an alarm function (EWD is optional on sizes 10+ - 550+ l/s and 12-690 l/s; standard on sizes ≥550F).

## Certification

- ISO 8573-2:2007
- ISO 12500-1:2007



EWD electronic drain

# DDp(+)/PDp(+) SERIES

## Optimal dry dust filtration

DDp(+) and PDp(+) filters efficiently prevent dust, particulates and micro-organisms arising from corrosion, dirt and adsorption material from entering your compressed air stream. These innovative filtration solutions are engineered to cost-effectively provide the best air purity and meet today's increasing quality demands.



## YOUR BENEFITS

### Maximum dirt, solid particles, micro-organisms and rust particles removal

High-efficient glass fiber and foam media.

### Significant energy savings & limited system operating costs

Optimal design and filter media allow for low pressure losses.

### High reliability

High-performance stainless steel cores, double O-rings, epoxy sealed caps, and anti-corrosive coated filter housing.

### Easy maintenance

External ribs on the threaded housing, or a rotating bottom cover for the welded housings, and push-on elements.

### Monitoring of energy use

Differential pressure indication (indicator for sizes 10-35 l/s, gauge for sizes 45-8000 l/s) (optional for standard range).

## Performance

	DDp	PDp	DDp+	PDp+
Contaminant	Dry dust			
Test method	ISO 8573-4:2001, ISO 12500-3:2009			
Particle removal efficiency (% at MPPS)	99.81	99.97	99.92	99.98
Dry pressure drop (mbar)	135	150	85	100
Element service	After 4,000 operating hours or 1 year or 350 mbar pressure drop			
Precede with	Dryer	Dryer DDp	Dryer	Dryer DDp+

## Sizing & dimensions

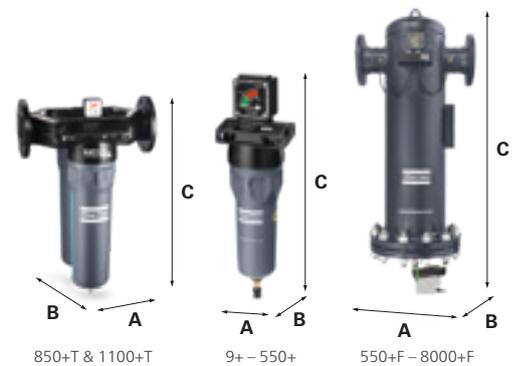
FILTER SIZE DDp/PDp		Nominal capacity				Reference pressure		Maximum pressure		Connections	Dimensions						Free space for cartridge replacement		Weight	
		Standard		+							A		B		C		D			
Standard	+	l/s	cfm	l/s	cfm	bar(e)	psig	bar(e)	psig	in	mm	in	mm	in	mm	in	mm	in	kg	lbs
12	10+	12	25	10	21	7	102	16	232	3/8	90	3.5	61	2.4	268	10.6	75	2.9	1.0	2.2
25	20+	25	53	20	42	7	102	16	232	1/2	90	3.5	61	2.4	268	10.6	75	2.9	1.1	2.4
45	35+	45	95	35	74	7	102	16	232	1/2	90	3.5	61	2.4	323	12.7	75	2.9	1.3	2.9
65	50+	65	138	50	106	7	102	16	232	3/4 & 1	110	4.3	99	3.9	374	14.7	75	2.9	1.6	4.2
90	70+	90	191	70	148	7	102	16	232	1	110	4.3	99	3.9	414	16.3	75	2.9	2.1	4.6
160	130+	160	339	130	275	7	102	16	232	1-1/2	140	5.5	105	4.1	520	20.5	100	3.9	4.2	9.3
215	170+	215	456	170	360	7	102	16	232	1-1/2	140	5.5	105	4.1	603	23.7	100	3.9	4.5	9.9
265	210+	265	562	210	445	7	102	16	232	1-1/2	140	5.5	105	4.1	603	23.7	100	3.9	4.6	10.1
360	310+	360	763	310	657	7	102	16	232	2 & 2-1/2	179	7.0	121	4.8	689	27.1	150	5.9	6.9	15.2
525	425+	525	1112	425	901	7	102	16	232	3	210	8.3	128	5.0	791	31.1	200	7.9	11.0	24.2
690	550+	690	1462	550	1165	7	102	16	232	3	210	8.3	128	5.0	961	37.9	200	7.9	12.6	27.8
630F	550+F	630	1335	550	1165	7	102	16	232	DN80	370	14.6	280	11	1295	51.0	1375	54.1	76.0	167.6
-	850+T	-	-	850	1801	7	102	16	232	DN100	510	20.1	418	16.5	796	31.3	200	7.9	35.2	77.6
970F	850+F	970	2055	850	1801	7	102	16	232	DN100	510	20.1	410	16.1	1360	53.5	1500	59.1	141.0	310.9
-	1100+T	-	-	1100	2331	7	102	16	232	DN100	510	20.1	418	16.5	966	38.0	200	7.9	37.4	82.4
1260F	1100+F	1260	2670	1100	2331	7	102	16	232	DN100	510	20.1	410	16.1	1360	53.5	1500	59.1	143.0	415.3
1600F	1400+F	1600	3390	1400	2967	7	102	16	232	DN150	620	24.4	485	19.1	1480	58.3	1560	61.4	210.0	463.0
2200F	1800+F	2200	4662	1800	3814	7	102	16	232	DN150	640	25.2	490	19.3	1555	61.2	1640	64.6	176.0	388.0
2400F	2200+F	2400	5086	2200	4662	7	102	16	232	DN150	640	25.2	490	19.3	1555	61.2	1640	64.6	178.0	392.4
3600F	3000+F	3600	7628	3000	6357	7	102	16	232	DN200	820	32.3	650	25.6	1745	68.7	1710	67.3	420.0	925.9
-	4000+F	-	-	4000	8476	7	102	16	232	DN200	820	32.3	650	25.6	1745	68.7	1710	67.3	428.0	943.6
-	5000+F	-	-	5000	10595	7	102	16	232	DN250	820	32.3	650	25.6	1745	68.7	1710	67.3	432.0	952.4
-	6000+F	-	-	6000	12714	7	102	16	232	DN250	920	32.3	815	32.1	2085	80.3	1625	64	671.0	1479.3
-	7000+F	-	-	7000	14833	7	102	16	232	DN300	920	36.2	815	32.1	2085	82.1	1625	64	675.0	1488.1
-	8000+F	-	-	8000	16952	7	102	16	232	DN300	1040	40.9	930	36.6	2070	81.5	1625	64	900.0	1984.2

## Correction factors

Inlet pressure (bar)	1	2	3	4	5	6	7	8	10	12	14	16
Inlet pressure (psig)	15	29	44	58	72.5	87	102	116	145	174	203	232
Correction factor	0.38	0.53	0.65	0.75	0.83	0.92	1.00	1.06	1.20	1.31	1.41	1.50

### Example

- Working pressure 3 bar(g), compressed air flow 35 l/s.
- Multiply the nominal capacity of the selected filter with the corresponding correction factor at the required working pressure to obtain the capacity at working pressure:
  - Size 50+: 50 l/s \* 0.65 = 33 l/s => the 50+ filter size is not large enough.
  - Size 70+: 70 l/s \* 0.65 = 46 l/s => the 70+ filter size is the size to select.



## Options

- Filter connection kit for easy mounting in series (10+ - 550+ l/s and 12-690 l/s).
- Wall-mounting kit simplifies installation (10+ - 550+ l/s and 12-690 l/s).
- Voltage-free contact mounted in the differential pressure gauge, to give remote indication of cartridge replacement.

## Certification

- ISO 8573-4:2001
- ISO 12500-3:2009

Voltage-free contact



# QDT SERIES

## Activated carbon towers for optimal oil vapor filtration

The high efficiency activated carbon tower is capable of removing hydrocarbons, odors and oil vapor from compressed air.

The activated carbon will, by the use of adsorption,

reduce the residual oil content to lower than 0.003 mg/m<sup>3</sup>.

The pressure drop is low and stays minimal during the filter's lifetime.



## YOUR BENEFITS

### Maximum oil vapor removal

Superb activated carbon material.

### Low pressure drop

Optimal internal flow path.

### High reliability

Robust design and optimal filter material.

### Options

- Oil indicator ensures pure air.
- Wall mounting kit for easy installation (20 – 185 l/s).



### Certification

ISO 8573-5:2001

## Performance

	QDT
Contaminant	Oil vapor
Test method	ISO 8573-5:2001, ISO 12500-2:2007
Maximum oil carry-over (mg/m <sup>3</sup> )*	0.003
Dry pressure drop (mbar)	125 (QDT 20-310) 72 (QDT 425-1800)
Element service	After 4,000 operating hours or 1 year
Precede with	Water separation UD+ or DD+/PD+ Dryer

\* After UD+ or DD+/PD+ with inlet oil concentration of 10 mg/m<sup>3</sup>.

## Sizing & dimensions

FILTER SIZE QDT	Nominal capacity		Connections G or NPT threaded	Dimensions						Weight	
				A		B		C			
	l/s	cfm	DIN or ANSI flanged	mm	in	mm	in	mm	in	kg	lbs
20	20	42	1/2"	490	19	223	9	190	7	10	22
45	45	95	1"	715	28	223	9	190	7	15	33
60	60	127	1"	840	33	223	9	190	7	18	40
95	95	210	1"	715	28	387	15	190	7	29	64
125	125	265	1 1/2"	840	33	387	15	190	7	34	75
150	150	318	1 1/2"	715	28	551	22	190	7	42	93
185	185	392	1 1/2"	840	33	551	22	190	7	50	110
245	245	519	1 1/2"	840	33	715	28	190	7	67	148
310	310	657	1 1/2"	840	33	879	35	190	7	84	185
425	425	901	DN80 / 3"	2148	85	710	28	600	24	264	581
550	550	1165	DN80 / 3"	2190	86	710	28	670	26	302	664
850	850	1801	DN100 / 4"	2320	91	724	29	805	32	391	860
1100	1100	2331	DN100 / 4"	2450	97	934	37	820	32	602	1324
1800	1800	3814	DN150 / 6"	2612	103	1046	41	980	39	882	1940

## Correction factors

For other compressed air inlet temperatures, please multiply the filter capacity by the following correction factor (Kt):

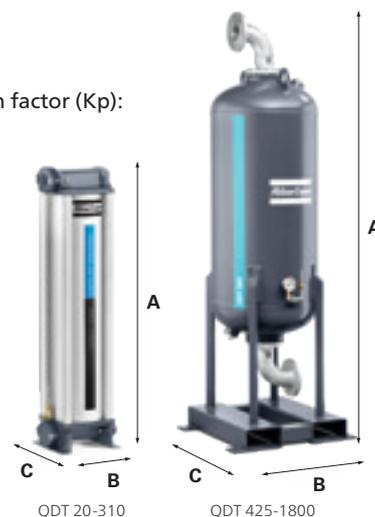
Inlet temperature °C	20	25	30	35	40	45	50	55	60
Inlet temperature °F	68	77	96	95	104	113	122	131	140
Correction factor	1	1	1	1	0.85	0.67	0.59	0.48	0.42

For other compressed air inlet pressures, please multiply the filter capacity by the following correction factor (Kp):

Inlet pressure bar	3	4	5	6	7	8	9	10	11	12	13
Inlet pressure psi	44	58	73	87	102	116	131	145	160	174	193
Correction factor	0.57	0.77	0.83	1	1	1	1	1.05	1.05	1.11	1.18

### Example

- Working temperature 50°C, pressure 12 bar(g), compressed air flow 120 l/s.
- Multiply the nominal capacity of the selected filter with the corresponding correction factors at the required working temperature and pressure to obtain the capacity at operating condition
  - QDT 150:  $150\text{l/s} * 0.59 * 1.11 = 98\text{l/s} \Rightarrow$  A QDT 150 filter is not large enough
  - QDT 195:  $195\text{l/s} * 0.59 * 1.11 = 128\text{l/s} \Rightarrow$  A QDT 195 filter is the correct size



## UD+ & QDT: the winning combination



## CLASS 1: Total oil, according ISO 8573-1:2010

The Atlas Copco UD+ - QDT filter train meets the requirements of air purity class 1 for total oil, according to ISO 8573-1:2010, in a typical compressed air installation.



UD+	QDT
Liquid oil & oil aerosol removal	Oil vapor removal
Guaranteed 0.0009 mg/m <sup>3</sup> aerosol and liquid	Guaranteed 0.003 mg/m <sup>3</sup> vapor
40% pressure drop reduction compared to DD+/PD+	65% pressure drop reduction compared to previous QDT
50% footprint reduction	Extremely compact compared to vessel designs

# QD(+) SERIES

## High performance oil vapor filters

QD(+) filters efficiently reduce hydrocarbons, odors and oil vapor in your compressed air stream to protect your investment, equipment and processes. The activated carbon layers will, by the use of adsorption, reduce the residual oil content to less than 0.003 mg/m<sup>3</sup>. The pressure drop is low and stays minimal during the lifetime of the filter.



## YOUR BENEFITS

### Maximum oil vapor removal

Highly efficient activated carbon layers.

### Significant energy savings & limited system operating costs

Low pressure losses.

### High reliability

High-performance stainless steel cores, double O-rings, epoxy sealed caps, and anti-corrosive coated filter housing.

### Easy maintenance

External ribs on the threaded housing, or a rotating bottom cover for the welded housings, and push-on elements.

## Options

- Filter connection kit for easy mounting in series (10+ - 550+ l/s and 12-690 l/s).
- Wall mounting kit simplifies installation (10+ - 550+ l/s and 12-690 l/s).

For sizing and dimensions, please refer to the product pages of the DD(+) & PD(+) Series.

## Performance

	QD	QD+
Contaminant	Oil vapor	
Test method	ISO 8573-5:2001	
Maximum oil carry-over (mg/m <sup>3</sup> )*	0.003*	
Dry pressure drop (mbar)	190	140
Element service	After 1,000 operating hours or 1 year. Service life is decreased when inlet temperature exceeds 35°C, 95°F	
Precede with	Water separation DD/PD Dryer	Water separation UD+ or DD+/PD+ Dryer

\* After UD+ or DD(+)/PD(+) with inlet oil concentration of 10 mg/m<sup>3</sup>.

# SFA SERIES

## Silicone-free removal of oil aerosol, dust and oil vapor

Superb air purity is a prerequisite to safeguard your instruments and end product. Our silicone-free SFA filters efficiently prevent dry and wet dust, particulates, oil aerosol and water drops from entering your compressed air system. The SFA series is manufactured and treated according to the high standards of silicone-free equipment, and certified by the Fraunhofer Institute as guaranteed silicone-free.



## YOUR BENEFITS

### Maximum contaminant removal

Removal of dry and wet dust, particulates, oil aerosol and water droplets. High-efficiency glass fiber and fleece media.

### Significant energy savings & limited system operating costs

Optimal design and filter media allow for low pressure drops.

### High reliability

High-performance stainless steel cores, double O-rings, epoxy sealed caps and anti-corrosive coated filter housing.

### Easy maintenance

External ribs on the threaded housing and push-on elements.

### Monitoring of energy use

Differential pressure indication (indicator for sizes 9-32 l/s, gauge for sizes 44-520 l/s) (optional).

## Applications

- Painting
- Automotive

## Options

- Filter connection kit (9-520 l/s).
- Wall-mounting kit (9-520 l/s).
- Quick coupling (DD & PD only).
- EWD no-loss electronic drain (DD & PD only).
- Voltage-free contact mounted in the differential gauge (not for QD).

## Certification

Paint compatibility certificate (Fraunhofer Institute)



The performance of the SFA filters is comparable to the performance of the + range filters (please refer to pages 8, 10 and 14).

## Sizing & dimensions

FILTER SIZE	Nominal capacity*		Maximal capacity*		Connections G or NPT	Dimensions						Free space for cartridge replacement		Weight	
	l/s	cfm	l/s	cfm		A		B		C		D		kg	lbs
DD, DDp, PD, PDp, QD	l/s	cfm	l/s	cfm	in	mm	in	mm	in	mm	in	mm	in	kg	lbs
9	9	19	11	23	3/8	90	3.54	61	2.40	268	10.55	75	2.95	1	2.2
17	17	36	21	45	1/2	90	3.54	61	2.40	268	10.55	75	2.95	1.1	2.4
32	32	68	40	85	1/2	90	3.54	61	2.40	323	12.72	75	2.95	1.3	2.9
44	44	93	55	117	3/4 & 1	110	4.33	98.5	3.88	374	14.72	75	2.95	1.9	4.19
60	60	127	75	159	1	110	4.33	98.5	3.88	414	16.3	75	2.95	2.1	4.6
120	120	254	150	318	1-1/2	140	5.51	105	4.13	520	20.47	100	3.94	4.2	9.3
150	150	318	188	399	1-1/2	140	5.51	105	4.13	603	23.47	100	3.94	4.5	9.9
175	175	371	219	464	1-1/2	140	5.51	105	4.13	603	23.47	100	3.94	4.6	10.1
280	280	594	350	742	2 & 2-1/2	179	7.05	121	4.76	689	27.13	150	5.91	6.9	15.2
390	390	827	488	1035	3	210	8.27	128	5.04	791	31.14	200	7.87	11	24.2
520	520	1102	650	1378	3	210	8.27	128	5.04	961	37.83	200	7.87	12.6	27.8

\* Nominal pressure: 7 bar(e)/102 psig; temperature: 20°C, 68°F.



# H SERIES

## Guaranteed air purity up to 350 bar

High pressure filters efficiently reduce oil aerosol, dust and wet dust, particulates, water droplets and oil vapor in your compressed air stream to protect your investment, equipment and processes. Our innovative high pressure filtration solutions are engineered to cost effectively provide the best air purity and meet today's increasing quality demands up to working pressures of 350 bar. All high pressure filter housings are hydraulically tested to ensure safe and reliable operation at all times. A pressure test certificate accompanies each filter.



## YOUR BENEFITS

### Maximum contaminant removal (dry & wet dust, particulates, oil aerosol and water droplets)

High-efficient glass fiber and fleece media.

### Significant energy savings & limited system operation cost

Optimal design and filter media allow for low pressure losses.

### High reliability

High-performance stainless steel cores, double O-rings, epoxy sealed caps and anti-corrosive coated filter housing.

## Applications

- Chemical
- Food & beverage
- Manufacturing
- Military
- Oil & gas

## Performance

	DDHp+	PDHp+	DDH+	PDH+	QDH+
Contaminant	Dry dust		Oil aerosol/wet dust		Oil vapor
Test method	ISO 8573-4:2001 ISO 12500-3:2009		ISO 8573-2:2007 ISO 12500-1:2007		ISO 8573-5:2001
Maximum oil carry-over (mg/m <sup>3</sup> )	-	-	0.08*	0.007*	0.003**
Particle removal efficiency (% at MPPS)	99.92 (0.1)	99.98 (0.06)	N/A	N/A	N/A
Dry pressure drop (mbar)	85	100	N/A	N/A	140
Wet pressure drop (mbar)	N/A	N/A	180	215	N/A
Element service	After 4,000 operating hours or 1 year or 350 mbar pressure drop		After 4,000 operating hours or 1 year		After 1,000 operating hours or 1 year
Precede with	N/A	DDHp+	N/A	DDH+	DDH+/PDH+

Always install a liquid water separation system in front of a filter. Water separation is not needed in the high pressure line if there is a sufficiently low PDP in the low pressure line (e.g. nitrogen skid, low pressure line with adsorption dryer).

\* Inlet oil concentration = 10 mg/m<sup>3</sup>. Oil = oil aerosol and liquid.

\*\* After DD(+)/PD(+) with inlet oil concentration of 10 mg/m<sup>3</sup>.

## Sizing & dimensions

FILTER SIZE	Nominal capacity			Connections	Dimensions						Weight	
					A		B		C			
DDH, DDHp, PDH, PDHp, QDH	m³/h	l/s	cfm	in	mm	in	mm	in	mm	in	kg	lbs
<b>20 bar Aluminum</b>												
15+	54	15	32	3/8	90	3.5	61	2.4	268	10.6	1.0	2.2
32+	115	32	68	1/2	90	3.5	61	2.4	268	10.6	1.1	2.4
55+	198	55	117	1/2	90	3.5	61	2.4	323	12.7	1.3	2.9
80+	288	80	170	3/4 & 1	110	4.3	99	3.9	374	14.7	1.6	3.5
110+	396	110	233	1	110	4.3	99	3.9	414	16.3	2.1	4.6
200+	720	200	424	1 1/2	140	5.5	105	4.1	520	20.5	4.2	9.3
270+	972	270	572	1 1/2	140	5.5	105	4.1	603	23.7	4.5	9.9
330+	1188	330	699	1 1/2	140	5.5	105	4.1	603	23.7	4.6	10.1
490+	1764	490	1038	2 & 2 1/2	179	7.0	121	4.8	689	27.1	6.9	15.2
<b>50 bar Aluminum</b>												
160+	160	44	94	1/4	63	2.5	63	2.5	150	5.9	0.3	0.7
250+	250	69	147	3/8	63	2.5	63	2.5	190	7.4	0.3	0.7
450+	450	125	265	1/2	114	4.4	114	4.4	305	11.9	2.6	5.7
550+	550	153	324	3/4	114	4.4	114	4.4	305	11.9	2.6	5.7
835+	835	232	491	1	114	4.4	114	4.4	395	15.4	3.3	7.3
1250+	1250	347	736	1 1/2	146	5.7	146	5.7	435	17.0	7.5	16.5
1725+	1725	479	1015	1 1/2	146	5.7	146	5.7	435	17.0	7.5	16.5
1925+	1925	535	1133	2	146	5.7	146	5.7	435	17.0	7.5	16.5
3200+	3200	889	1883	2	146	5.7	146	5.7	635	24.8	10	22.0
<b>50 bar Stainless Steel</b>												
100+	100	28	59	1/4	85	3.3	85	3.3	202	7.9	1.7	3.7
200+	200	56	118	3/8	85	3.3	85	3.3	227	8.9	2	4.4
340+	340	94	200	1/2	85	3.3	85	3.3	257	10.0	2.2	4.8
500+	500	139	294	3/4	110	4.3	110	4.3	270	10.5	4	8.8
1000+	1000	278	589	1	110	4.3	110	4.3	422	16.5	5	11.0
1700+	1700	472	1000	1 1/2	150	5.9	150	5.9	517	20.2	15	33.1
2040+	2040	567	1200	2	150	5.9	150	5.9	517	20.2	15	33.1
3400+	3400	944	2000	2	150	5.9	150	5.9	817	31.9	21	46.3
<b>100 bar Stainless Steel</b>												
100+	100	28	59	1/4	65	2.5	65	2.5	135	5.3	3.2	7.1
315+	315	88	185	1/2	65	2.5	65	2.5	250	9.8	5.6	12.3
460+	460	128	271	3/4	88	3.4	88	3.4	275	10.7	6.1	13.4
680+	680	189	400	1	135	5.3	135	5.3	265	10.3	10.5	23.1
1200+	1200	333	706	1	135	5.3	135	5.3	480	18.7	14.7	32.4
1700+	1700	472	1000	1 1/2	150	5.9	150	5.9	525	20.5	22	48.5
3400+	3400	944	2000	2	150	5.9	150	5.9	815	31.8	28	61.7
<b>350 bar Stainless Steel</b>												
48+	48	13	28	1/4	41	1.6	41	1.6	103	4.0	1.6	3.5
111+	111	31	65	1/4	65	2.5	65	2.5	135	5.3	3.2	7.1
255+	255	71	150	1/2	88.5	3.5	88.5	3.5	210	8.2	5.6	12.3
510+	510	142	300	3/4	88.5	3.5	88.5	3.5	280	10.9	6.1	13.4
750+	750	208	441	1	150	5.9	150	5.9	330	12.9	14.5	32.0
1330+	1330	369	783	1	150	5.9	150	5.9	480	18.7	17.4	38.3

## Correction factors

<b>20 bar Aluminum</b>										
Operating pressure	barg	-	-	-	-	-	14	16	18	20
	psig	-	-	-	-	-	203	232	261	290
Correction factor							0.9	0.95	1	1.05
<b>50 bar Aluminum &amp; Stainless Steel</b>										
Operating pressure	barg	4	6	8	10	15	20	30	40	50
	psig	58	87	116	145	218	290	435	581	726
Correction factor		0.14	0.22	0.28	0.34	0.47	0.56	0.7	0.85	1
<b>100 bar Stainless Steel</b>										
Operating pressure	barg	20	30	40	50	60	70	80	90	100
	psig	290	435	581	726	871	1016	1161	1306	1451
Correction factor		0.45	0.57	0.68	0.8	0.84	0.88	0.92	0.96	1
<b>350 bar Stainless Steel</b>										
Operating pressure	barg	-	-	50	100	150	200	250	300	350
	psig	-	-	726	1451	2177	2903	3628	4354	5080
Correction factor				0.73	0.78	0.82	0.87	0.91	0.96	1



### Example

- Working pressure 300 bar(g), compressed air flow 500 m³/h.
- Multiply the nominal capacity of the selected filter with the corresponding correction factor at the required working pressure to obtain the capacity at working pressure:
  - Size 510+: 510 m³/h \* 0.96 = 490 m³/h => the 510+ filter size is not large enough.
  - Size 750+: 750 m³/h \* 0.96 = 720 m³/h => the 750+ filter size is the size to select.

# MV SERIES

## Medical vacuum filters for optimal protection of man and machine

Medical vacuum filters are installed at the inlet of the vacuum pump to remove any liquid, solid or bacterial contamination which could damage the vacuum pump and biologically infect the downstream air. Our innovative medical vacuum filtration solutions comply with HTM medical standards.



## YOUR BENEFITS

### Maximum contaminant removal

Removal of dry and wet dust, particulates, oil aerosol and water droplets. High-efficiency glass fiber and fleece media.

### Significant energy savings & limited system operation cost

Optimal design and filter media allow for low pressure losses.

### High reliability

High performance stainless steel cores, double O-rings, epoxy sealed caps and anti-corrosive coated filter housing.

### Easy maintenance

External ribs on the threaded housing and push-on elements.

### Monitoring of energy use

Differential pressure indication show the pressure loss.

## Applications

- Medical
- Dental
- Veterinary

## Performance

	MV
Contaminant	Dry dust
Maximum temperature	60°C/140°F
Maximum working vacuum	Full vacuum
Test method	Sodium flame test BS 3928:1969, based on requirements of HTM2022
Particle removal efficiency (%)*	99.995
Dry pressure drop (mbar)	30
Element service	After 2,000 operating hours or 1 year or 100 mbar pressure drop

\* In accordance with BS 3928-1969.

## Sizing & dimensions

FILTER SIZE MV	Nominal Capacity	Connections	Dimensions						Weight	
			A		B		C			
			l/min	in	mm	in	mm	in	mm	in
10	400	1/2	60	2	90	4	240	9	1.3	2.9
20	800	1	76	3	110	4	300	12	2.1	4.6
60	2400	1 1/2	103	4	140	5	489	19	4.6	10.1
80	3400	2	135	5	179	7	575	22	6.9	15.2
120	4900	3	155	6	210	8	677	26	11.0	24.2
160	6700	3	155	6	210	8	847	33	12.6	27.8

## Correction factors

Operating pressure	bar(a)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
	Psig	1	3	4	6	7	9	10	12	13	15
	Torr = mm Hg	75	150	225	300	375	450	525	600	675	750
Correction factor		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1

### Example

- Working vacuum 300 mbar(a), capacity 1,000 l/min.
- Multiply the nominal capacity of the selected filter with the corresponding correction factor at the required working vacuum to obtain the correct capacity:
  - Size 60: 2,400 l/min \* 0.3 = 720 l/min => the 60 filter size is not large enough.
  - Size 80: 3,400 l/min \* 0.3 = 1,020 l/min => the 80 filter size is the size to select.



## Options

- Wall mounting kit.
- Drain flask.



Drain flask



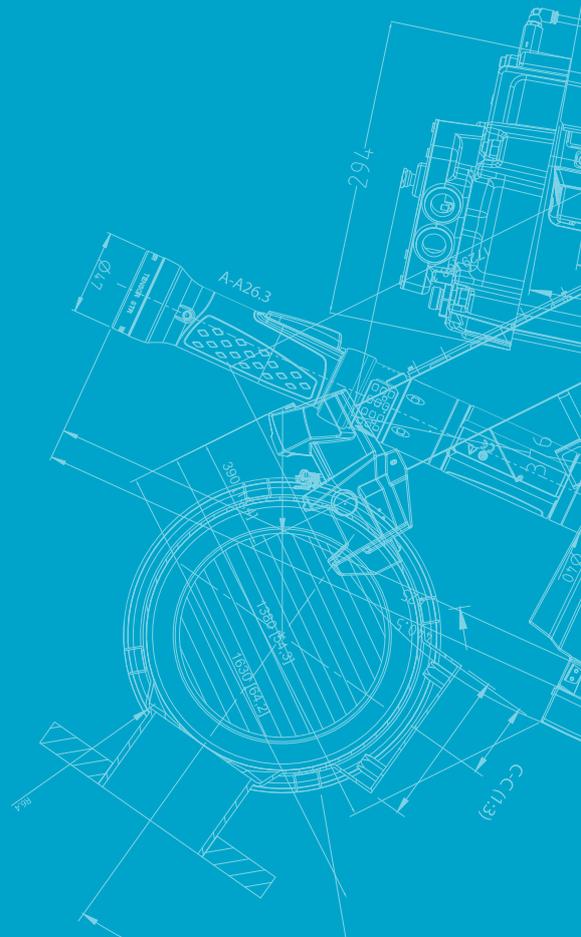
## Certification

BS 3928 Sodium flame test certificate based on requirements of HTM2022.



Atlas Copco

atlascopco.com



2935 0932 44 © 2018. Atlas Copco Airpower NV, Belgium. All rights reserved. Designs and specifications are subject to change without notice or obligation. Read all safety instructions in the manual before usage.

TÜV Rheinland Energie und Umwelt GmbH  
51101 Köln

Atlas Copco Airpower n.v.  
P.O. Box 104  
Boomsesteenweg 957  
2610 Wilrijk  
Belgium

**931 / 21229599/01**  
Dr. Norbert Horlemann  
Tel: 0221 806-1896  
Fax: 0221 806-1461  
horlema@de.tuv.com  
17 August 2015

**Validation Certificate**  
**Evaluation of the air purity class for total oil**  
**after an Atlas Copco DD+ PD+ QDT filter train**  
**Test report no.: 931 / 21229599/01**

The Atlas Copco DD+ PD+ QDT filter train meets the requirements of air purity **class 1** for total oil, according to ISO 8573-1:2010, in a typical compressed air installation.

Details can be found in the full test report no.: 931/21229599/01

i. V.



Dr. Walter Dormagen

i. A.



Dr. Norbert Horlemann

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Web www.umwelt-tuv.de

Managing Director  
Marcus Staude

District Court  
Cologne HRB 56171



# Type test Certificate

## Evaluation of the solid particle removal efficiency of Atlas Copco DD+/DDp+ or PD+/PDp+ filter According to ISO12500-3:2009

Test report IBR JN: 12828A & 12828C

**Report prepared for:** Atlas Copco Airpower n.v.

**Issue date of certificate:** 26<sup>h</sup> October, 2012

PN for DD+/DDp+: 1 624 1829 09

PN for PD+/PDp+: 1 624 1829 07

	0.01 µm	0.1µm	0.5 µm	1 µm	5µm
DD+/DDp+	99.93%	99.92%	99.95%	99.998%	>99.999%
PD+/PDp+	99.995%	99.992%	99.997%	>99.999%	>99.999%

	MPPS	Efficiency at MPPS
DD+/DDp+	0.1 µm	99.92%
PD+/PDp+	0.06 µm	99.98%

Report Authorized By:

Susan H Goldsmith Managing Director

Note: Full report available upon request

TÜV Rheinland LGA Products GmbH • 51105 Cologne • Germany

Atlas Copco Airpower n.v.  
P.O. Box 104  
Boomsesteenweg 957  
2610 Wilrijk  
Belgium

Your correspondence  
Dr. Norbert Horlemann

Order-No.:3047714

Phone +49 (0)221-806-1896  
Fax +49 (0)221-806-1461  
Mail horlema@de.tuv.com

Customer Service Center  
for Products  
Phone +49 911 655-5225

Mail service@de.tuv.com

Cologne, 05<sup>th</sup> March 2012

**Type Test certificate**  
**Evaluation of the residual aerosol oil content after an**  
**Atlas Copco PD+ filter**  
**Test report No.: 3047714**

The Atlas Copco PD+ filters are measured under the test conditions according to ISO 12500-1:2007, the compressed air samples are analyzed according to the ISO 8573-2:2007 test method.

	Maximum residual aerosol oil content	Average wet pressure drop
PD+-filter	0.008 mg/m <sup>3</sup>	< 215 mbar

i. V.



Björn Koch

i. A.



Dr. rer. nat. Norbert Horlemann

TÜV Rheinland  
LGA Products GmbH

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51105 Cologne  
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Board of Management

Dipl.-Ing.  
Jörg Mähler, Spokesman

Dipl.-Kfm.  
Dr. Jörg Schlösser

Nuremberg HRB 26013  
VAT No.: DE811835490

1. **DECLARATIE DE CONFORMITATE CE**

2 Noi, Atlas Copco Airpower n.v., declaram pe proprie raspundere, ca produsul

3 Numele echipamentului: **Filtru de aer**

4 Tipul echipamentului: **DD/ DDp/ PD/ PDp/ QD (9-120)**

5 Seria echipamentului: **N/A**

6 ce cade sub incidenta articolului 12.2 a al Directivei CE 2006/42/CE, respecta Cerintele de Siguranta si pe cele Fundamentale pentru Sanatate ale Directivei Consiliului anterior mentionat, si amendamentele pentru armonizarea legislatiei Statelor Membre referitoare la Agregate.

7 Echipamentul este conform cu cerintele directivelor si a amendamentelor :

Directiva privind variatiile legilor Statelor Membre cu privire la	Standarde folosite	Comentarii
Echipament sub presiune	97/23/CE	X

8 Standardele tehnice folosite sunt mentionate in atasament

9 **Conformitatea specificatiilor** **Conformitatea produsului**

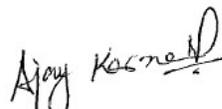
10 **cu directivele** **cu specificatiile**

11

12 Emitent Product engineering Fabricant

14 Nume Yves Goister Ajay Karnail

15 Semnatura

16 Data 26/04/2018

## DIRECTIVA ECHIPAMENTELOR SUB PRESIUNE 97/23/CE

### 1 Estimari de conformitate urmarite: Vezi Tabelul. T1.

a. Categorie	b. Aplicabil	c. Modul	d. Org. Autorizat	e. Certificat de ref.
I	X	H	(1)	f:Ref: 0038/PED/2003004/A
II		H	(1)	
III		H	(1)	
IV		B	(2)	
		D	(1)	

(1) Notified body number 0038  
Lloyd's Register Verification Ltd  
71 Fenchurch street  
EC3M – 4 BF London  
United Kingdom

(2) Notified body number 0343  
Lloyd's Register Stoomwezen  
P.O. Box 701  
3000 A 3 Rotterdam  
Netherlands

2. Descrierea echipamentului sub presiune care constituie ansamblul : vezi tabelul T.2

<b>a. Echipamentul, subiect al Directivei 87/404/CEE privind rezervoare sub presiune simple, este exclus din directiva 97/23/CE in concordanta cu articolul I, sectiunea 3.3</b>			
<b>b. Echipamentul face parte din categoria I, in concordanta cu directiva 97/23/CE, si este integrat in masina si este exclus din articolul I, sectiunea 3.6.</b>			
<b>c. Echipamentul din articolul 3.3 al 97/23/CE este subiectul unei practici si testari ingineresti</b>			
<b>h. Cat. II si mai sus</b>	<b>d. Echipament</b>		<b>g. Declaratie de conformitate atasat (include procedura de testare de conformitate urmata, identificarea standardelor)</b>
	<b>e. Descriere si/sau f. Componenta</b>		
	Accesorii de siguranta	Supapa de siguranta	
	Rezervor	Separator de ulei	

**3 Standarde estimate folosite: vezi Tabelul 2**

**4 Standarde tehnice nationale si specificari pentru utilizare: vezi Tabelul 2**

Atlas Copco Airpower n.v.

A company within the Atlas Copco Group

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P.O. Box 100  
B-2610 Wilrijk-Antwerp  
Belgium  
www.atlascopco.com

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Belgium

Phone: +32 (0)3 870 21 11  
Fax: +32 (0)3 870 24 43

Com. Reg. Antwerp 44651  
V.A.T. 403.992.231

For info, please contact your local Atlas Copco representative



# Type test Certificate

## Evaluation of the solid particle removal efficiency of Atlas Copco DD+/DDp+ or PD+/PDp+ filter According to ISO12500-3:2009

Test report IBR JN: 12828A & 12828C

**Report prepared for:** Atlas Copco Airpower n.v.

**Issue date of certificate:** 26<sup>h</sup> October, 2012

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PN for PD+/PDp+: 1 624 1829 07

	0.01 µm	0.1µm	0.5 µm	1 µm	5µm
DD+/DDp+	99.93%	99.92%	99.95%	99.998%	>99.999%
PD+/PDp+	99.995%	99.992%	99.997%	>99.999%	>99.999%

	MPPS	Efficiency at MPPS
DD+/DDp+	0.1 µm	99.92%
PD+/PDp+	0.06 µm	99.98%

Report Authorized By:

Susan H Goldsmith Managing Director

Note: Full report available upon request

# Certificate of Approval

This is to certify that the Management System of:

## Walker Filtration Ltd

Birtley Road, Washington, NE38 9DA, United Kingdom

has been approved by Lloyd's Register to the following standards:

### ISO 9001:2015

Approval number(s): ISO 9001 – 00005450

#### The scope of this approval is applicable to:

Design and manufacture of compressed air and gas filters, dryers and purification equipment, vacuum filters, autoclave filters for steam sterilizers and smoke evacuators for use in medical laser surgery.



**David Derrick**

Area Operations Manager UK & Ireland

Issued by: Lloyd's Register Quality Assurance Limited



001

# Certificate of Approval

This is to certify that the Management System of:

## Atlas Copco Airpower NV

Boomsesteenweg 957, 2610 Wilrijk, Belgium

has been approved by Lloyd's Register to the following standards:

### ISO 13485:2016

Product approval number: ISO 13485 – 0010344

**The scope of this approval is applicable to:**

Manufacture of medical device components for compressors, vacuum pumps and air treatment products.



**David Derrick**

Area Operations Manager UK & Ireland

Issued by: Lloyd's Register Quality Assurance Limited



001

# Certificate of Training

*It is hereby certified, that*

**Mr. Valeriu Nastasiu**  
**Data Control SRL, Republic of Moldova**

*has been trained in January 2018*  
*at company DataControl SRL*  
*in Chisinau, Republic of Moldova*

*Training Subjects :*

- \* *Medical Oxygen Plants (OGP);*
- \* *Oil-injected, oil-free compressors (GA, ZT);*
- \* *Refrigerant air dryers (FX, FD);*
- \* *Compressed air filters (DD, PD, QD, QDT).*

*Installation, assembling, function, maintenance*  
*and spare parts.*

Country Manager  
Compressor Technique Equipment

Liviu Chelaru



## CERTIFICATE OF CONFORMITY

As the manufacturer we hereby confirm that screw compressor oil  
AEON 3000 type F-2105:

Properties	Test method/ result
Viscosity, cst	ASTM D445
At 40 C	46,0
At 100 C	7
ISO grade	46
Pour point C	ASTM D97...-33
Flash point C	ASTM D92...230
Demulsibility	ASTM D1401- at 54C 20 min
Colour	Clear pale yellow

has been manufactured, inspected and tested according to our quality system, which  
fulfils the requirements of EN ISO 9001:2000 - quality standard

Gardner Denver Oy



Jari Hellsten

Manager - Quality Control



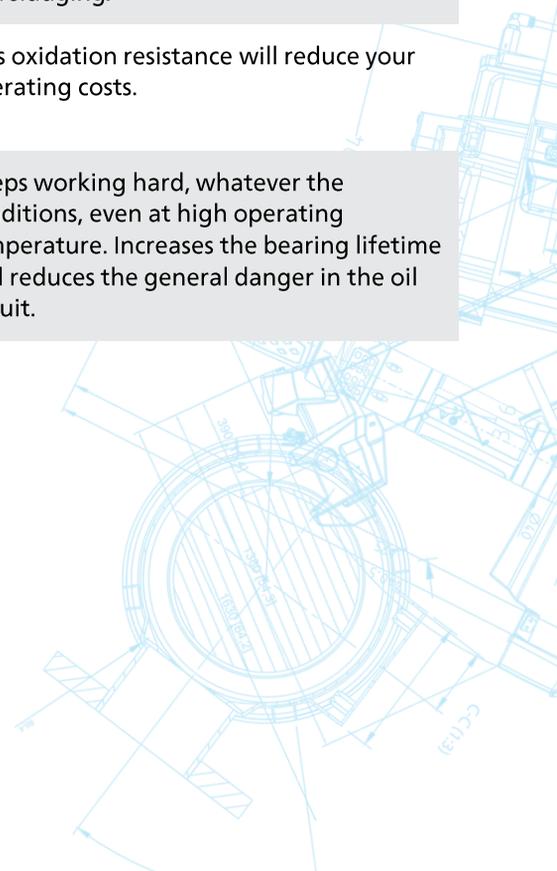
# Roto Z Fluid Atlas Copco Lubricants

Roto Z is cost-effective as drain intervals are doubled in comparison to conventional lubricants.

Roto Z incorporates the functional benefits of a preservative mineral oil, which allows for an extended on-site storage of several months.



Features		Benefits
<b>Excellent anti-wear properties</b>	Roto Z contains proven anti-wear additives to be effective throughout the range of operating conditions.	This load carrying capacity is particularly important because oil-free compressors are driven by gears, requiring oils with anti-wear properties reducing gear teeth and bearing wear.
<b>Thermal stability</b>	Roto Z is thermally stable in severe conditions of load and temperature.	The oil has a high resistance to degradation and sludging.
<b>Oxidation resistance</b>	The good oxidation control minimizes the formation of aggressive corrosive acids, deposits and sludge.	This oxidation resistance will reduce your operating costs.
<b>High viscosity index</b>	Oil viscosity remains at a more stable level, even at high temperatures. This means lubricating efficiency is maintained under varying conditions.	Keeps working hard, whatever the conditions, even at high operating temperature. Increases the bearing lifetime and reduces the general danger in the oil circuit.



# Lubricant characteristics

Appearance: Light brown

Performance	Method	Unit	Value
Density at 15°C	ISO 3675	kg/dm <sup>3</sup>	0,860
Viscosity at 40°C	ASTM D 445	mm <sup>2</sup> /s	68
Viscosity index	ASTM D 2270		133
Foam stability	ASTM D 892	ml	0/0/0
Total acid number	ASTM D 974	mg KOH/g	0,18
Rust test	ASTM D 665B		Pass
Pour point	ASTM D 97	°C	-30

These characteristics are typical of current production. Whilst future production will conform to Atlas Copco's specification, variations in these characteristics may occur. Complies with ISO 6743 /3 /1A class L-DAH

## ID Card

Roto Z Fluid	
Oil type	Mineral based oil with tailored additive pack
Service intervals	All conditions 8 000 h < 55 kW 16 000 h > 55 kW
Environment	Ambient temperature range at 0°C to 50°C
Equipment	Atlas Copco oil-free screws
Compatibility	ZR – ZS – ZT – ZA – ZE compressors
Capacity (ID)	5 l plastic can (2908 8503 00) 20 l plastic can (2908 8501 01) 209 l metal drum (2908 8500 00)

