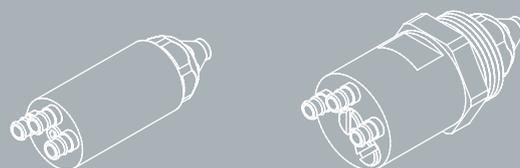
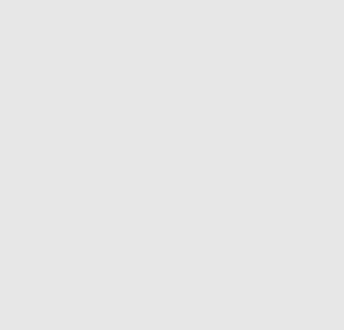
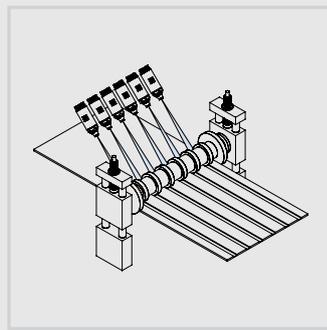
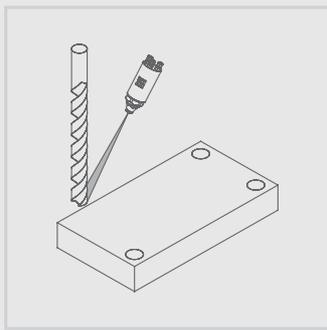
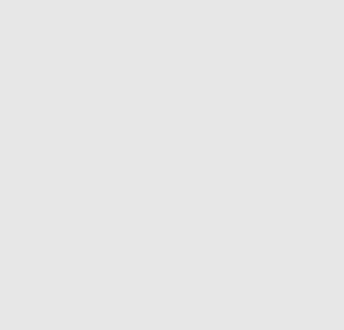
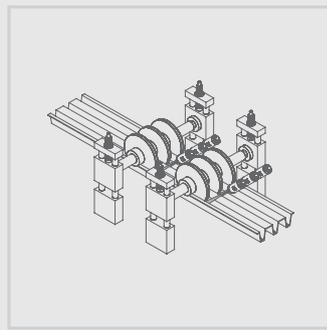
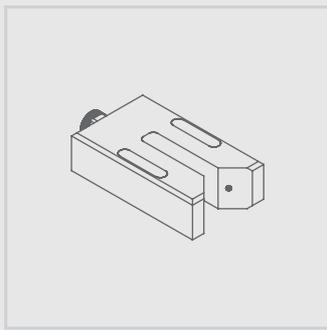
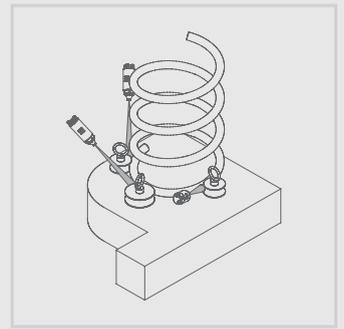
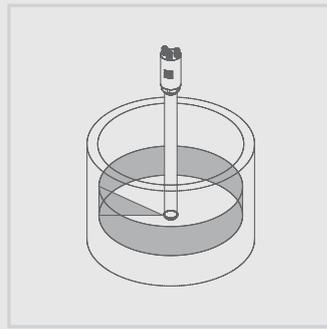
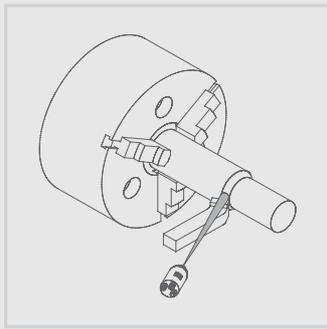
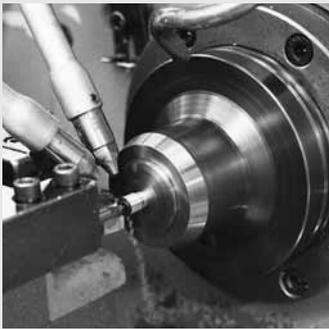
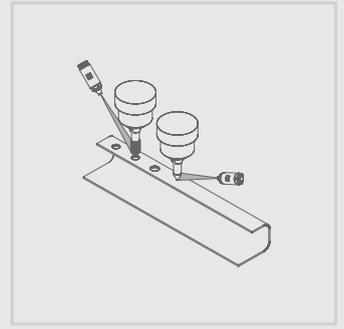
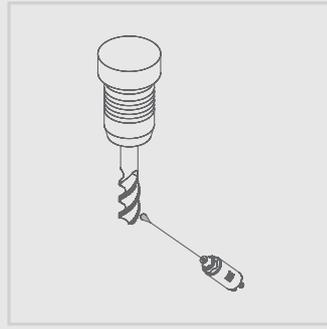
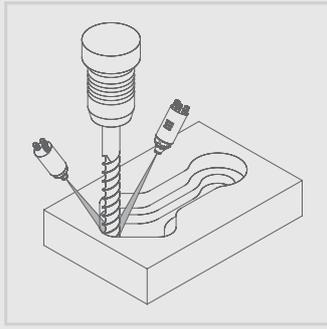
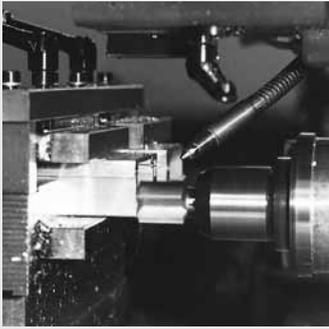


# INDUTEC® MS SD3 & SD4 COAXIAL SPRAYING HEADS

Operating instructions

As of 23.07.2014





Status as of July 23, 2014

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We reserve the right to make technical modifications which serve to improve the system or individual components of the system regarding its intended use.

## 1. INTRODUCTION

The **INDUTECH® MS SD3** & **SD4** coaxial spraying heads are used to apply small to medium amounts of various cooling and lubricating mediums. Depending on the attachment used, various spray patterns and spraying angles can be generated. Depending on the viscosity of the medium to be applied, the spray pattern can be adjusted as required by changing the nozzle size, the spraying air pressure and the medium pressure. The spraying air, control air and medium are fed into the system through three hoses. The **INDUTECH® MS SD3** & **SD4** coaxial spraying heads are precision devices, which serve as reliable tools for many years providing that the following instructions are observed.

## 2. SAFETY

### DUTIES OF THE USER

- › The user must read the operating instructions before operating or servicing the system.
- › Operating or servicing processes must not be performed if the respective person is uncertain about the purpose, the consequences or the exact execution of the respective process.

### INTENDED USE

The **INDUTECH® MS SD3** & **SD4** coaxial spraying heads are used to apply viscous mediums onto or into tools and workpieces. The aim of using the system is to reduce the amount of medium required to an absolute minimum in order to minimise environmental pollution as much as possible.

### HAZARD WARNINGS

The operating instructions warn users directly before every work step about hazards which can damage their health. Different warnings combining images and text are used depending on the respective hazard.



#### WARNING!

Indicates a possibly dangerous situation.  
If this situation is not avoided, death or severe injuries can be the consequence.



#### ATTENTION!

Indicates a possibly dangerous situation.  
If this situation is not avoided, slight or minor injuries can be the consequence.  
This word is also used to warn users about possible material damage.



#### IMPORTANT!

Indicates tips for application and particularly useful information.  
There is no dangerous or harming situation.

## 3. FUNCTION DESCRIPTION

The **INDUTECH® MS SD3** & **SD4** coaxial spraying heads work pneumatically. The pressurised medium is shut off by a needle, which closes the medium outlet by means of a spring. When the control air is activated, the needle is opened, and the medium outlet is cleared. When the control air fails or is turned off, the needle shuts off the medium outlet by means of a spring. The separately controlled spraying air forms the medium into a jet. The medium is sprayed out of the nozzle in different spray patterns and spraying angles depending on the attachments used. The functions of the needles are: opening by means of air pressure/closing by means of spring force.

## 4. INSTALLATION AND ACTIVATION

The coaxial spraying head can be installed in every position. The distance to the application surface depends on the desired application width. An M5 thread is provided in the main body for permanent installation; different types of brackets are available as an option. Just contact your MENZEL application engineer or visit our website at [www.menzel-metallchemie.de](http://www.menzel-metallchemie.de)

Natural vibration develops when the coaxial spraying head works intermittently. Therefore, it is necessary to ensure that the spraying head is installed properly and safely. Natural vibration, which is transferred to the coaxial spraying head from the machine, must be avoided.

## HOSE INSTALLATION

The three hoses are connected as follows:

- › Spraying air (blue): Connection Z to the connection kit on the front plate/valve unit
- › Control air (black): Connection S to the connection kit on the front plate/valve unit
- › Medium (transparent or white): Connection M to the pressure vessel/to the valve unit

All connections are mounted from the back of the spraying head. An optional angle adapter is available for connection on the side (cannot be installed on the **INDUTECH® MS** coaxial spraying head SD3).

## OPERATING DIRECTIONS/OPERATING CONDITIONS



### ATTENTION!

Do not point the jet towards persons. It is absolutely recommended to wear eye protection. Depending on the spraying air and medium pressure, the spraying process can be accompanied by noise. Ear protection should be worn as and when required.



### WARNING!

Hazard due to flammable, harmful mediums. The safety information on the pressure vessels and the safety data sheet must be observed.

The **INDUTECH® MS** SD3 & SD4 coaxial spraying heads work with a control air pressure of 6 bar. Spraying air pressure and medium pressure must always be in close proportion to each other. Should high medium pressures be required, the accident prevention regulations of the accident prevention and insurance associations must be observed in any event.

Spraying and control air are connected in parallel.

The application must be controlled intermittently or continuously. Depending on the respective application, the control air pressure must be adjusted according to the operating cycles performed on the one hand, and the higher or lower medium pressures on the other hand.



### IMPORTANT!

Nozzle and nozzle needle can be damaged as a consequence of improper handling. Only reduce the medium flow rate (by turning the stroke adjustment screw/throttle screw to the right) while the medium is being issued. Do not turn the adjustment screw/throttle screw further to the right after closing the nozzle.

During longer periods of inactivity, the medium can remain in the coaxial spraying head if it is pressurised (no connection to the outside air).

## 5. MAINTENANCE AND REPAIRS

All pressure lines must be depressurised and removed from the spraying head prior to all repair and maintenance work.



### WARNING!

Hazard due to flammable, harmful mediums. The safety information on the vessels and the safety data sheet must be observed.



### WARNING!

The coaxial spraying head must only be opened in a depressurised condition, i.e., an inoperable condition. Danger of components being expelled from the device.

**INDUTECH® MS** SD3 & SD4 coaxial spraying heads are high-quality precision tools, which are not prone to failure and which work virtually maintenance-free providing they are used properly. It must be assumed that the medium to be applied is always processed in a clean, filtered state. The air must also be cleaned before being fed into the coaxial spraying heads. Individual operating conditions and different application materials require the corresponding minimum tool maintenance.

## CLEANING

Do not use metal aids with sharp edges, but only soft brushes for external cleaning, e.g. of nozzle tips. Coaxial spraying heads which are soiled after use must be rinsed thoroughly. This particularly applies if the needle, needle seal or internal nozzle must be changed.

## FAILURE: NO MEDIUM OUTPUT

- › Check whether the control air pressure is high enough (5.5 to 6.0 bar).
- › Check whether O-rings are damaged.
- › Check whether the needle has got blocked up within the seal (part no. 7).
- › Check whether the control air impulse is set to a sufficient value.
- › Check whether the coaxial spraying head is soiled.



### WARNING!

All supply pressure lines must be depressurised and removed from the pressure controllers or the medium pressure vessel before starting any repair or maintenance work.



### IMPORTANT!

Seals and seal seatings can be damaged. Do not use metal objects with sharp edges to remove or install seals.

## 6. OPTIONAL EQUIPMENT

There are a number of attachments and accessories for the **INDUTEC® MS** SD<sub>3</sub> & SD<sub>4</sub> coaxial spraying heads for generating various different spray patterns and spraying angles. Virtually any case of application is possible. Just contact your MENZEL application engineer or visit our website at [www.menzel-metallchemie.de](http://www.menzel-metallchemie.de).

## 7. MANUFACTURER'S DECLARATION

The **INDUTEC® MS** FD<sub>4</sub> Z<sub>2</sub>, SD<sub>4</sub> M<sub>2</sub>, SD<sub>3</sub> and SD<sub>4</sub> coaxial spraying heads were constructed and manufactured in accordance with the harmonised standard DIN EN 292 by MENZEL Metallchemie GmbH, Im Gewerbepark 14, 73329 Kuchen, Germany. They can be used as accessories for machines complying with EC regulations without affecting their conformity.

## 8. SEALING MATERIAL

Sealing material	Standard elastomer	Area of use and application Special features
As a default, all seals which come into contact with medium are made of fluoro rubber FKM (trade name Viton).	Fluoro rubber Viton FKM	Mineral oils and fats, aliphatic, aromatic and chlorinated hydrocarbons, petrol, super, diesel fuels, flame-resistant liquids on a phosphate-ester basis, acids, alkaline solutions, silicone oils and fats. Suited for high vacuums.
<b>Using of other mediums</b> Instead of the Viton seals, a number of other seal materials can be used for the application of many other mediums with the <b>INDUTEC® MS</b> minimum-quantity cooling and lubricating system. There are suitable seals for virtually every application.	Ethylene propylene diene M-class rubber EPDM  Acrylonitrile butadiene rubber NBR  Perfluorelastomer ISOLAST FFKM	Peroxide-cured, hot water, steam, brake fluids, detergents, alcohols, ketones, car engine coolant, flame-resistant liquids on a phosphoric acid-ester basis, organic and inorganic acids and bases. Not mineral oil-resistant.  Standard material for hydraulic and pneumatic systems. Pressure liquids on a mineral oil basis, animal and vegetable oils and fats, flame-resistant liquids (HFA, HFB, HFC), aliphatic hydrocarbons (propane, butane, petrol). Silicone oils and fats, water up to +80° C, biopetroleum of synthetic esters and vegetable oils.  Possesses the broadest available resistance to chemicals; therefore, it can be used for virtually any application in chemical process engineering in a temperature range from -25° C to +240° C Excellent resistance to nearly all inorganic and organic acids, ketones, esters, solvents, amines, hot water/steam as well as ethylene and propylene oxide.

## 9. FLOW RATES

### MATERIAL FLOW RATE

Depending on the settings of the swivel throttle valves or the precision screw-in unions and the application-related requirements, the **INDUTEC® MS** FD4 Z2, SD4 M2, SD3 and SD4 coaxial spraying heads can produce the following flow rates:

Control air pressure: 6 bar (without spraying air)  
 Medium: water  
 Hoses: 1 m each

Medium pressure in bar	In-head cartridge	0.5	1.0	1.5
Flow rate in ml/min (adjustable)	∅ 0.1 mm	0 – 2.2	0 – 3.5	0 – 4.5
	∅ 0.2 mm	0 – 18	0 – 26	0 – 32
	∅ 0.3 mm	0 – 42	0 – 62	0 – 72
	∅ 0.4 mm	0 – 61	0 – 93	0 – 114
	∅ 0.5 mm	0 – 92	0 – 140	0 – 180
	∅ 0.6 mm	0 – 124	0 – 188	0 – 232
	∅ 1.0 mm	0 – 190	0 – 270	0 – 342

Depending on the viscosity and the texture of the medium as well as the adjustable vessel pressure (up to 2.5 bar for standard models and 6.0 bar for custom models), a variety of flow rates can be achieved.

### AIR FLOW RATE

Depending on the settings of the swivel throttle valves or the precision screw-in unions and the application-related requirements, the **INDUTEC® MS** FD4 Z2, SD4 M2, SD3 and SD4 coaxial spraying heads can produce the following (spraying air) flow rates:

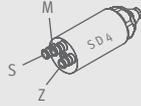
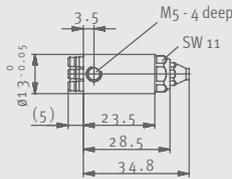
Hoses: 1 m each

Spraying air pressure in bar	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Flow rate in l/min (adjustable)	0 – 12	0 – 24	0 – 34	0 – 44	0 – 51	0 – 58	0 – 65	0 – 73	0 – 80	0 – 88	0 – 97	0 – 106

A spraying air rate of approx. 180 l/min. can be achieved by using the **INDUTEC® MS** coaxial spraying head FD4 Z2.

# 10. TECHNICAL DATA

## INDUTEC® MS SD4



### Use/application

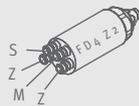
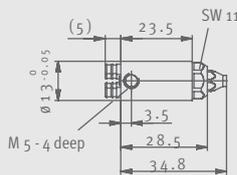
- › Standard nozzle
- › External lubrication
- › O-rings Viton

### Technical data

Main body	Stainless steel
Coaxial spraying head and needle	Stainless steel
Control air pressure	min. 5,5 – max. 6 bar
Spraying air pressure	max. 6 bar
Medium pressure	max. 6 bar
Max. spraying air quantity	approx. 106 l/min.*

\* Inlet pressure (spraying air) 6 bar  
Hose length 1 m

## INDUTEC® MS FD4 Z2



### Use/application

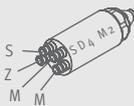
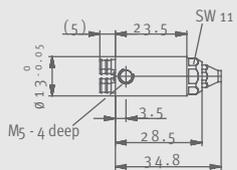
- › External lubrication/ internal cooling
- › Increased air flow rate due to 2nd spraying air connection
- › O-rings Viton

### Technical data

Main body	Stainless steel
Coaxial spraying head and needle	Stainless steel
Control air pressure	min. 5,5 – max. 6 bar
Spraying air pressure	max. 6 bar
Medium pressure	max. 6 bar
Max. spraying air quantity	approx. 180 l/min.*

\* Inlet pressure (spraying air) 6 bar  
Hose length 1x 1 m Ø 6 mm  
2x 50 cm Ø 4 mm

## INDUTEC® MS SD4 M2



### Use/application

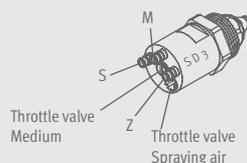
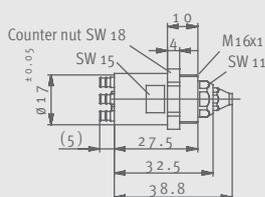
- › External lubrication
- › Medium circulation for demixing mediums
- › Two different mediums
- › O-Rings Viton

### Technical data

Main body	Stainless steel
Coaxial spraying head and needle	Stainless steel
Control air pressure	min. 5,5 – max. 6 bar
Spraying air pressure	max. 6 bar
Medium pressure	max. 6 bar
Max. spraying air quantity	approx. 106 l/min.*

\* Inlet pressure (spraying air) 6 bar  
Hose length 1m

## INDUTEC® MS SD3



### Use/application

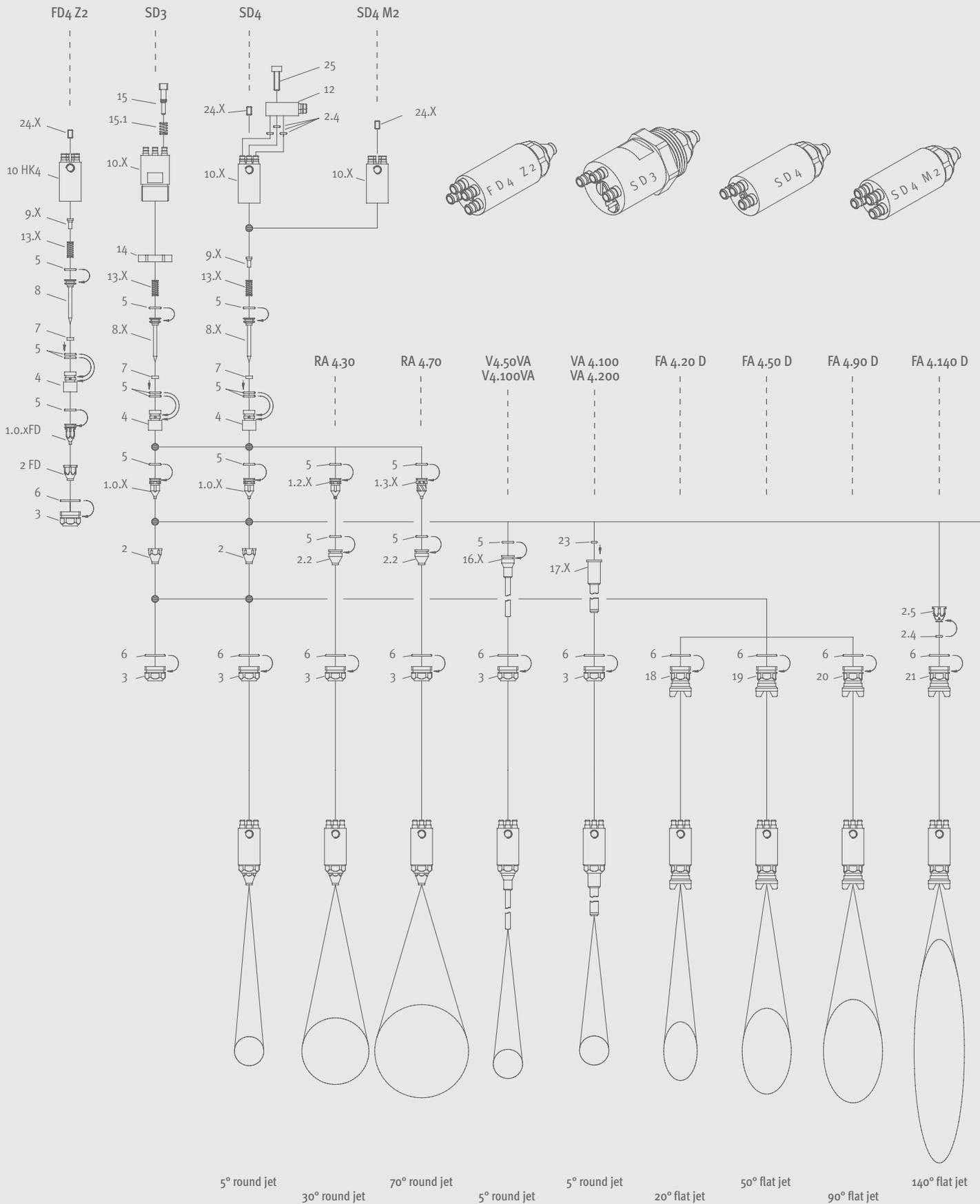
- › External lubrication
- › Medium quantity adjustable on main body (grid)
- › Spraying air quantity adjustable on main body
- › O-Rings Viton

### Technical data

Main body	Stainless steel
Coaxial spraying head and needle	Stainless steel
Control air pressure	min. 5,5 – max. 6 bar
Spraying air pressure	max. 6 bar
Medium pressure	max. 6 bar
Max. spraying air quantity	approx. 106 l/min.*

\* Inlet pressure (spraying air) 6 bar  
Hose length 1m

# 11. INDUTECH® MS COAXIAL SPRAYING HEADS

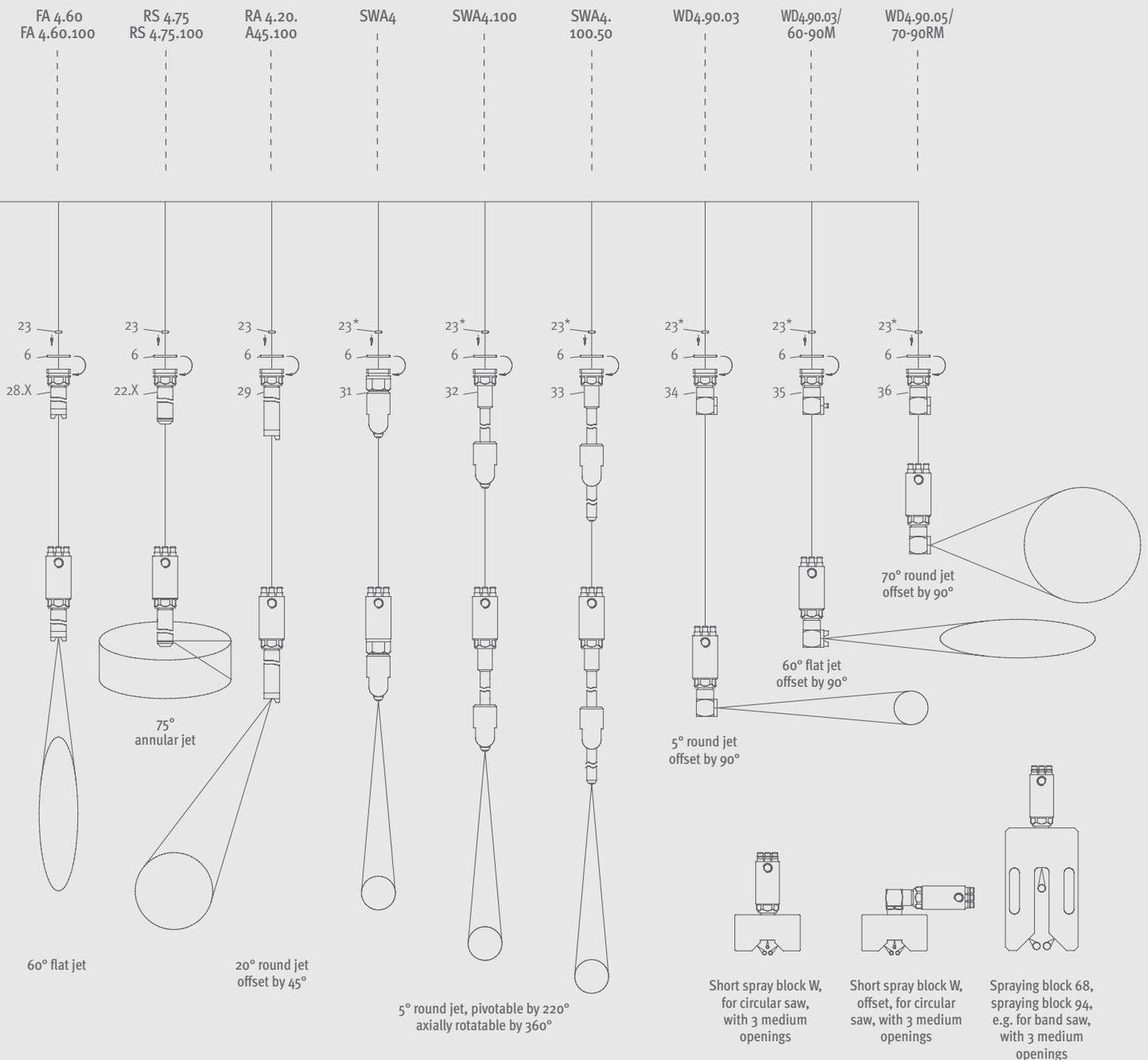


**INDUTECH® MS SD3/SD4** stands for a nozzle concept, with which diverse requirements can be met. The system is based on a coaxial spraying head, which generates a round jet with a 5° spraying angle. With special accessories, various different spray patterns and spraying angles can be generated for virtually any type of application.

Due to their extremely small design, the coaxial spraying heads only require little space. For spraying areas which are difficult to access, they can be extended with the aid of a flexible attachment. Material flow rates can be changed by equipping the spraying heads with special in-head cartridges.

The theoretical spraying angles are approximate values. The decisive factor is always the interaction between the medium and the spraying air pressure.

Due to the different combinations of the modules, countless versions of the coaxial spraying head can be produced. Therefore, it is possible to compile the optimum coaxial spraying head for virtually any type of application.



\* Attention: cannot be replaced by customer for SWA4, SWA 4.100, SWA4.100.50, WD4.90.03, WD4.90.03/60-90M and WD4.90.05/70-90RM 7

## PARTS LIST INDUTECH® MS SD3 & SD4 COAXIAL SPRAYING HEADS

Part no.	Order no.	Designation
1.0.1	INDUTECH® MS SID4.0.1	Special in-head cartridge 5° ø 0.1 mm – can only be used in combination with part no. 8.1
1.0.2	INDUTECH® MS SID4.0.2	Special in-head cartridge 5° ø 0.2 mm
1.0.3	INDUTECH® MS SID4.0.3	Special in-head cartridge 5° ø 0.3 mm
1.0.4	INDUTECH® MS SID4.0.4	Special in-head cartridge 5° ø 0.4 mm
1.0.5	INDUTECH® MS SID4.0.5	Special in-head cartridge 5° ø 0.5 mm
1.0.6	INDUTECH® MS SID4.0.6	Special in-head cartridge 5° ø 0.6 mm
1.1.0	INDUTECH® MS SID4.1.0	Special in-head cartridge 5° ø 1.0 mm
1.2.2	INDUTECH® MS RA4.30.2	Special in-head cartridge 30° ø 0.2 mm
1.2.3	INDUTECH® MS RA4.30.3	Special in-head cartridge 30° ø 0.3 mm
1.2.4	INDUTECH® MS RA4.30.4	Special in-head cartridge 30° ø 0.4 mm
1.2.5	INDUTECH® MS RA4.30.5	Special in-head cartridge 30° ø 0.5 mm
1.2.6	INDUTECH® MS RA4.30.6	Special in-head cartridge 30° ø 0.6 mm
1.3.2	INDUTECH® MS RA4.70.2	Special in-head cartridge 70° ø 0.2 mm
1.3.3	INDUTECH® MS RA4.70.3	Special in-head cartridge 70° ø 0.3 mm
1.3.4	INDUTECH® MS RA4.70.4	Special in-head cartridge 70° ø 0.4 mm
1.3.5	INDUTECH® MS RA4.70.5	Special in-head cartridge 70° ø 0.5 mm
1.3.6	INDUTECH® MS RA4.70.6	Special in-head cartridge 70° ø 0.6 mm
2	INDUTECH® MS LK4	Air attachment
2.2	INDUTECH® MS LK4.RA	Air attachment for round jet attachment
2.4	INDUTECH® MS OR4.2.4	O-ring, Viton 2x1
2.5	INDUTECH® MS LK4.140	Air attachment for flat jet attachment 140°
3	INDUTECH® MS UR4	Union ring
4	INDUTECH® MS DI4	Sealing bush
5	INDUTECH® MS OR4.5	O-Ring, Viton, 5x1
6	INDUTECH® MS OR4.6	O-Ring, Viton 10x1
7	INDUTECH® MS QR4	Sealing ring, Viton, 2x1.5
8	INDUTECH® MS NK4	Needle with shank
8.1	INDUTECH® MS NK4.0.1	Needle with shank for special in-head cartridge ø 0.1 mm – can only be used in combination with part no. 1.0.1
9	INDUTECH® MS FGL4	Spring counter piece
9.1	INDUTECH® MS FGL DFE-4	Spring counter piece for part no. 13.1 – only available in combination with part no. 13.1
10	INDUTECH® MS HK4	Main body only for SD4
10.1	INDUTECH® MS HK3	Main body only for SD3
10.2	INDUTECH® MS HK SD4 M2	Main body only for SD4 M2
10.3	INDUTECH® MS HK FD4 Z2	Main body only for FD4 Z2
12	INDUTECH® MS WA4	Elbow connection 90° only for SD4
13	INDUTECH® MS FE4	Spring
13.1	INDUTECH® MS DFE4-FGL	Spring, weak, for low control air pressure incl. spring counter piece 9.1
14	INDUTECH® MS BFM3	Fastening nut SW 18x4 only for SD3
15	INDUTECH® MS DRS3	Throttle screw with O-rings only for SD3
15.1	INDUTECH® MS FE3	Pressure spring for throttle screw DRS3 (15) only for SD3
16	INDUTECH® MS V4.50 VA	Extension 50 mm, ø 3 mm, with atomiser ø 1.5 mm*
16.1	INDUTECH® MS V4.100 VA	Extension 100 mm, ø 3 mm, with atomiser ø 1.5 mm*
17	INDUTECH® MS VA100	Extension 100 mm, ø 5 mm*
17.1	INDUTECH® MS VA200	Extension 200 mm, ø 5 mm*
18	INDUTECH® MS FA4.20D	Flat jet attachment 20°, rotatable*
19	INDUTECH® MS FA4.50D	Flat jet attachment 50°, rotatable*
20	INDUTECH® MS FA4.90D	Flat jet attachment 90°, rotatable*
21	INDUTECH® MS FA4.140D	Flat jet attachment 140°, rotatable*
22	INDUTECH® MS RS4.75	Annular jet attachment 75°, length 20 mm, ø 8 mm
22.1	INDUTECH® MS RS4.75.100	Annular jet attachment 75°, length 100 mm, ø 8 mm
23	INDUTECH® MS OR4.23	O-ring, Viton, 1.5x1 – cannot be replaced by customer for SWA4, SWA4.100, SWA4.100.50, WD4.90.03, WD4.90.03/60-90M and WD4.90.05/70-90RM
24	INDUTECH® MS HRS-K4	Stroke adjustment screw, short
24.1	INDUTECH® MS HRS-K4 F	Stroke adjustment screw, self-retaining, with spring
25	INDUTECH® MS ZS4	Cylinder head screw M3x10, only for SD4
28	INDUTECH® MS FA4.60	Flat jet attachment 60°, ø 8 mm, length 17 mm*
28.1	INDUTECH® MS FA4.60.100	Flat jet attachment 60°, ø 8 mm, length 100 mm*
29	INDUTECH® MS RA4.20.A45.100	Round jet attachment 20°, jet offset by 45°, length 100 mm, ø 8 mm*
31	INDUTECH® MS SWA4	Pivotable jet attachment, pivotable by 220°, axially rotatable by 360°
32	INDUTECH® MS SWA4.100	Pivotable jet attachment, pivotable by 220°, axially rotatable by 360°, incl. spraying head extension 100 mm
33	INDUTECH® MS SWA4.100.50	Pivotable jet attachment, pivotable by 220°, axially rotatable by 360°, incl. spraying head extension 100 mm as well as extension of the pivotable nozzle by a max. of 50 mm
34	INDUTECH® MS WD4.90.03	Special angular nozzle attachment, stainless steel, offset by 90°, 5° round jet, internal nozzle ø 0.3 mm*
35	INDUTECH® MS WD4.90.03/60-90M	Special angular nozzle attachment, stainless steel, offset by 90°, with 60° flat jet, internal nozzle ø 0.3 mm*
36	INDUTECH® MS WD4.90.05/70-90RM	Special angular nozzle attachment, stainless steel, offset by 90°, with 70° round jet, internal nozzle ø 0.5 mm*

For items which are required in special lengths or diameters, or need to be pre-bent, please contact our sales department. We would be glad to inform you comprehensively about the INDUTECH® MS System.

Please call us on

**+49 (0) 7331 98 78-0**

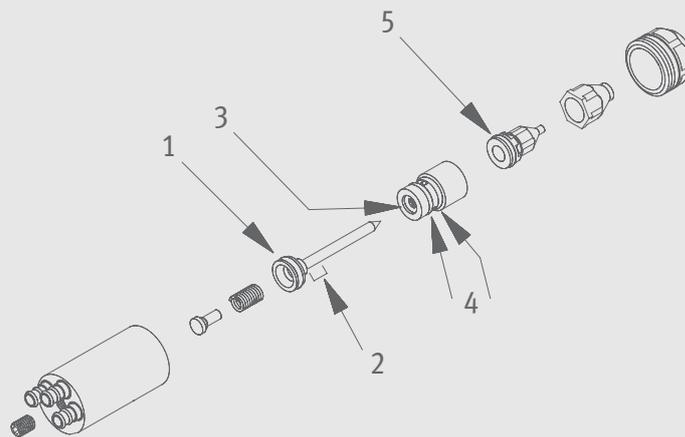
We look forward to your call.

■ special lengths also available ● special diameters also available ▲ pre-bent on request \* rotatable when loosened

## PARTS LIST INDUTEC® MS FD<sub>4</sub> Z<sub>2</sub> COAXIAL SPRAYING HEADS

Part no.	Order no.	Designation
1.0.2.FD	INDUTEC® MS SID <sub>4</sub> .0.2 FD	Special in-head cartridge 5° ø 0.2 mm
1.0.3.FD	INDUTEC® MS SID <sub>4</sub> .0.3 FD	Special in-head cartridge 5° ø 0.3 mm
1.0.4.FD	INDUTEC® MS SID <sub>4</sub> .0.4 FD	Special in-head cartridge 5° ø 0.4 mm
1.0.5.FD	INDUTEC® MS SID <sub>4</sub> .0.5 FD	Special in-head cartridge 5° ø 0.5 mm
1.0.6.FD	INDUTEC® MS SID <sub>4</sub> .0.6 FD	Special in-head cartridge 5° ø 0.6 mm
2 FD	INDUTEC® MS LK <sub>4</sub> FD	Air attachment stainless steel
3	INDUTEC® MS ÜR <sub>4</sub>	Union ring
4	INDUTEC® MS DI <sub>4</sub>	Sealing bush
5	INDUTEC® MS OR <sub>4</sub> .5	O-Ring, Viton, 5x1
6	INDUTEC® MS OR <sub>4</sub> .6	O-Ring, Viton 10x1
7	INDUTEC® MS QR <sub>4</sub>	Quad-ring seal, Viton, 2x1.5
8	INDUTEC® MS NK <sub>4</sub>	Needle with shank
9	INDUTEC® MS FGL <sub>4</sub>	Spring counter piece
9.1	INDUTEC® MS FGL DFE-4	Spring counter piece for part no. 13.1 – only available in combination with part no. 13.1
10 FD	INDUTEC® MS HK-FD <sub>4</sub> Z <sub>2</sub>	Main body only for FD <sub>4</sub> Z <sub>2</sub>
13	INDUTEC® MS FE <sub>4</sub>	Spring
13.1	INDUTEC® MS DFE <sub>4</sub> -FGL	Spring, weak for low control air pressure incl. spring counter piece 9.1
24	INDUTEC® MS HRS-K <sub>4</sub>	Stroke adjustment screw, short
24.1	INDUTEC® MS HRS-K <sub>4</sub> F	Stroke adjustment screw, self-retaining, with spring

## CARE INSTRUCTIONS FOR INDUTEC® MS SD<sub>4</sub> PRECISION COAXIAL SPRAYING HEADS



The following items must be lubricated after cleaning (check) and before assembly of **INDUTEC® MS SD<sub>4</sub>**:

- Item 1            1 Stk. O-Ring – 5 x 1 – for needle, (part no. 5)
- Item 2            the rear part of the needle shaft (application length approx. 4 mm)
- Item 3            quad-ring (O-ring) – 2 x 1.5 – from the sealing bush (part no. 7)
- Item 4            2 Stk. O-Rings – 5 x 1 – from the sealing bush (part no. 5)
- Item 5            1 Stk. O-Ring – 5 x 1 – from the internal nozzle (part no. 5)

The O-rings of items 4 and 5 do not have any influence on the actual function of the **INDUTEC® MS SD<sub>4</sub>**, but have to be slightly lubricated for problem-free assembly. **Recommended lubricants: molykote111, technical vaseline or similar**

### LUBRICATING INTERVALS

Depending on the medium used, the ambient conditions and the frequency of operation of the SD<sub>4</sub>, the SD<sub>4</sub> must be serviced and checked regularly; **under normal operating conditions, twice a year is sufficient.**

### LUBRICATING INTERVALS IN THE EVENT OF LUBRICANT STARVATION

When degreasing mediums are used, the needle is exposed to increased stress and wear due to the increased friction between the needle shaft and the quad-ring of the sealing bush. Maintenance intervals should be shorter in this case.

**Monthly maintenance would be appropriate; however, this must be verified on site.**

**In general, the spraying heads should be cleaned during every maintenance process, preferably with neutral cleaning agent. Furthermore, the spraying heads should be cleaned in an ultrasonic bath.**

 **Menzel Metallchemie**

MENZEL Metallchemie GmbH

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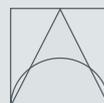
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