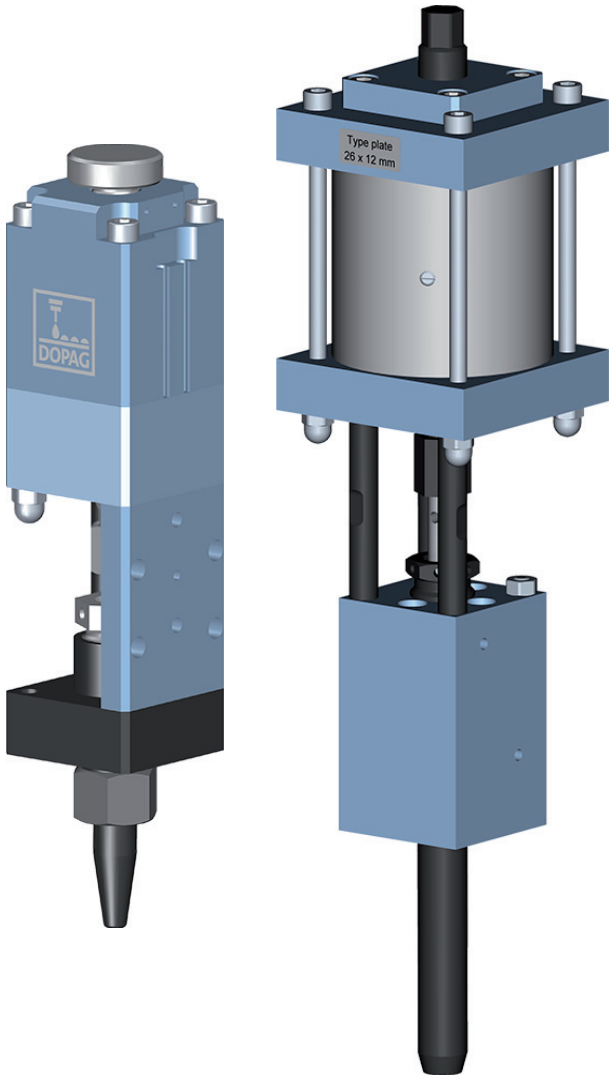
Assembly instructions

Dispensing valve ID6 & ID12



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HILGER&KERNGROUP

1 Contents

2 General

2.1 Object of assembly instructions

These assembly instructions are to ensure the safe, intended and efficient use of the module. They contain the relevant information for safety, overview, function, assembly, maintenance and disposal. The required information can be located in the assembly instructions using the contents index, title and marginal columns.

Ignoring the assembly instructions and the safety information can lead to hazards and restrictions for:

- the operator's health,
- the system and material assets of the operating company;
- efficient operation of the module.

NOTICE

Ignoring the assembly instructions

DOPAG (hereafter called the manufacturer of the module) shall take no responsibility whatsoever for any damage resulting from not observing the assembly instructions.

► Observe the assembly instructions!

The assembly instructions is part of this module. They must be made available to the operators at all times. The assembly instructions include behavior information which DOPAG as manufacturer of the module hands on to the final consumer, even if this module is part of a machine.

2.2 Keeping the assembly instructions

The assembly instructions including the Declaration of Incorporation must be enclosed with the module until it is installed in the machine. After the installation, the assembly instructions and the included Declaration of Incorporation form part of the machine's technical documentation.

2.3 Target audience

These assembly instructions are intended for the users who can be in charge of the assembly, operation, maintenance or disposal.

Assembly personnel

Persons working at and operating the module must possess sufficient training for the operations concerned. It is essential for personnel to have read and understood the asembly instructions.

Persons who service and repair the modules must be skilled and:

- adequately trained to undertake the operations necessary.
- be familiar with and follow the relevant technical regulations and safety instructions.
- have read and understood the assembly instructions.

Skilled persons mean those whose training and experience have provided them with adequate knowledge in the field of the module. This personnel must be familiar with the regulations applicable to occupational safety and accident prevention, directives and generally recognized rules on technology and standards, so that they can evaluate the operational safety of the module.

2.4 Note on changes

Text, illustrations and data are commensurate with the technical status of the machine at the time of these operating instructions going to print. The company reserves the right to make changes in the interests of ongoing development.

2.5 Symbols and pictograms

The assembly instructions contain various symbols and pictograms. They convey warnings, handling instructions, information and directions for action to be taken to the assembly and operating personnel.

▶ D...
• T...

Directions for action to be taken

▶ The triangle symbol indicates actions that must be carried out in a specific sequence.
  • The dot symbol indicates the reaction to an action.

Help symbols regarding directions for actions to be taken

Help symbols are found in graphic diagrams only. They support a direction for action to be taken by means of a sequence of numbers directly on the respective part. Help symbols usually consist of a colored circle and a number.

Warning signs, prohibition signs and mandatory signs.

Notes on safety, instructions and warnings are indicated by the appropriate ISO Safety Signs. They can be found in the operating instructions and on the module itself and it is essential that they are observed.

Pictograms

Buttons, switches, pressure gauges and functions are designated by pictograms in the assembly instructions and on the module itself. The letters A, B, C... in the pictograms identify the components.

Advice for the user

Advice for the user and tips for efficient operation of the module are indicated by the light bulb symbol and typeset in bold type. Follow these instructions!

2.6 Margin column

The margin column contains additional information (pictograms, keywords and descriptions of illustrations as well as directions for action to be taken). In addition, the margin column points out hazards and makes it easier to find what you search.

2.7 Safety advice

There are four types of safety information: Danger, warning, caution, note. They contain: Source of danger, consequences of the risk and avoidance measures to be taken.

Danger

Signal word to indicate a danger with a high risk that will lead directly to death or serious physical injury.

DANGER

Source of danger

Consequences of the risk

► Avoidance measures to be taken

Warning

Signal word to indicate a hazard with a medium risk that may lead to death or serious physical injury.

WARNING

Source of danger

Consequences of the risk

► Avoidance measures to be taken

Caution

Signal word to indicate a hazard with a low risk that can lead to minor or moderate physical injury.

CAUTION

Source of danger

Consequences of the risk

► Avoidance measures to be taken

Note

Signal word for a possible damaging situation, were the system or anything in the vicinity could be damaged.

NOTICE

Source of danger

Consequences of the risk

► Avoidance measures to be taken

2.8 Mandatory signs

Mandatory

Mandatory signs prescribe specific courses of action. They must be followed, as they help protect against injury.

Wear protective gloves

Wearing protective gloves prevents contact with toxic substances. Caustic burns and poisoning are avoided.

Wear protective goggles

Parts of the equipment operate under pressure and spraying substances can cause damage to eyes. Wearing eye protection avoids damage to eyes.

2.9 Transportation

The module is packaged and delivered by the manufacturer in a proper manner. It is protected for transport and against weather conditions, and provided with suitable packaging materials.

Transport the module to the application site in packaged condition if possible and only remove package before first use. The packaging protects the module.

2.10 Labeling

The type plate is located on the module and provides the following details:

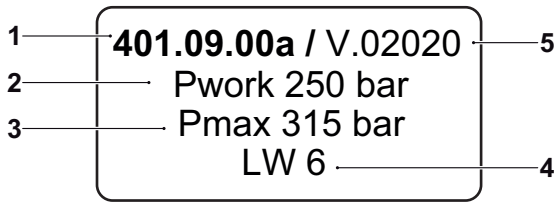
1 Item number

2 Pressure specifications Pwork

3 Pressure specifications Pmax

4 Clear width

5 Job number



Pwork

The allowable operating pressure must be below this value. The pressure may be dynamically available. This dynamic pressure may "briefly" exceed Pwork (minute range).

Pmax

This maximum pressure must not be dynamic. Pressure can occur in DOPAG systems, e.g. when the dispensing valve on a drum pump is closed and the pump "builds up pressure". This pressure must be relieved in case of standstill for a longer period.

3 Safety rules

3.1 Intended use

The dispensing valve is partly completed machinery as defined in the directive 2006/42/EC. The products are solely intended to discharge viscous liquids, adhesives, greases, etc. The materials to be processed must be approved by DOPAG Service. They have been manufactured according to the state of the art and according to the acknowledged safety rules. However, when using it, risks for the health of the user or a third person can remain or damage to the module or other material damage can occur.

- This module and its functions may only be used for the purposes of discharging liquids.
- Releasing and cutting off the flow of liquid and paste-like media of approx. 100 to 2,500,000 mPa s. Depending on application, material and design, this range may be larger or smaller.
- Discharge is carried out using a cannula or outlet nozzle.
- Working with materials that form explosive vapors or the use in an explosive environment is prohibited. This module is not explosion-proof.
- Processing foodstuff is prohibited. The materials used for the module are not suitable for processing foodstuff.
- The materials to be metered must be approved by DOPAG Service. If the composition changes or if a different type of material is to be used, this must be clarified and approved by DOPAG Service.

NOTICE

The use of material not approved by DOPAG Service may damage this module.

If for example seals cannot withstand the new composition, they will be destroyed.

► Information on your telephone contact can be obtained from www.dopag.com.

3.2 Foreseeable misuse

This module must not be used for:

- Discharge of reactive (mixed) material.
- Discharge of air, gas, and water.
- Discharge of foodstuffs.
- Discharge of powder or similar substances.

3.3 Product safety

The module conforms to acknowledged rules of engineering and technology and the relevant safety regulations. The correct operation of the module is required to avoid damage and accidents. Operating it incorrectly or subjecting it to abuse, or ignoring the application limits and the safety instructions, may imperil:

- the operator's health.
- the module and material assets of the operating company.
- efficient operation of the module.
- the environment.

The module may only be operated if it is in perfect condition and if the assembly instructions are observed.

3.4 Responsibilities of the operating company

The following responsibilities are generally applicable to the company operating the module:

- Observe the generally recognized rules that apply to occupational safety (PPE). Moreover, observe the basic regulations and rules on occupational safety and accident prevention applicable on site.
- The operating company is obliged to observe the regulations applicable to the use of equipment, especially those specified in EC Directive 2009/104/EC.
- The module may only be operated in a perfect and clean condition.
- Redesigning or modifying this module is prohibited.
- For repairs, please contact DOPAG Service www.dopag.com. Only genuine DOPAG spare parts may be used.
- Check the module at regular intervals for visible signs of damage and for correct functions.
- The operating company is responsible for the safety regulations in dealing with the material used.

3.5 Changes on the module

Basically, changes on the module are prohibited. However, if changes become necessary, please observe the following points:

- Do not undertake changes, add-on or modification to the module without express approval by the manufacturer.
- All redesigning measures require written approval by the manufacturer.
- Only genuine DOPAG spare parts may be used. Trouble-free operation is not guaranteed if parts other than the genuine parts are used.

3.6 Hazardous zones

The hazardous zone denotes the area on a module and/or in its vicinity in which there are dangers to safety or personal health. There are various danger zones around the module. All safety regulations given in the assembly instructions and information signs on the module must be observed. Observe the safety regulations in force for the respective installation site.

Particular sources of danger

Operating this module conforms to the general safety standards. However, hazards can arise in some situations.

- Whenever performing work relating to the assembly, disassembly, commissioning, operation, relocation, adaptation, maintenance and cleaning of the machine, the safety information given in the assembly instructions are to be observed.
- All service and maintenance work on the module must be carried out only after it has been turned off or depressurized.
- In all cases, observe the local regulations applicable to safety and accident prevention when operating the module.

Danger from electric power

Electricity is dangerous in many ways. Adhere to the following points:

- Work on power supply systems may only be performed by qualified electricians.
- Check the module's electrical equipment regularly. Loose connections and burnt cables should be removed immediately or restored to their proper condition.
- If work is necessary on live parts, a second person, who can turn off the main switch in an emergency, must assist.

Danger from high pressure

Pneumatic and hydraulic modules are pressurized.

- When dealing with the module, you must wear protective goggles and gloves.
- Depressurize the module before beginning the repair works.

Danger from toxic and combustible materials

Depending on the material being processed, special rules and regulations regarding occupational safety and accident prevention must be observed:

- When using solvents or other corrosive chemicals, special precautions must be taken, e.g. eye washing facilities.
- During flushing and cleaning processes, vaporization of solvents may create an explosive zone.
- See the material data sheet provided by the manufacturer.

3.7 Warranty and liability

Claims under the warranty and liability for personal and material damage are excluded if they are due to one or several of the following causes:

- Improper use of the module.
- Improper assembly, commissioning, operation and maintenance.
- Operating the module with faulty safety systems or protective systems that have been incorrectly fitted, or non-functional safety and protection devices.
- Disregarding instructions on safety, transport, storage, assembly, commissioning, maintenance and disposal of the module.
- Unauthorized structural modification to the components.
- Poor monitoring of components subject to wear.
- Repair work carried out improperly.
- Disasters caused by extraneous influences and force majeure.
- Use of spare parts which are not genuine DOPAG parts.
- Damage arising from normal wear and tear.

3.8 Declaration of incorporation

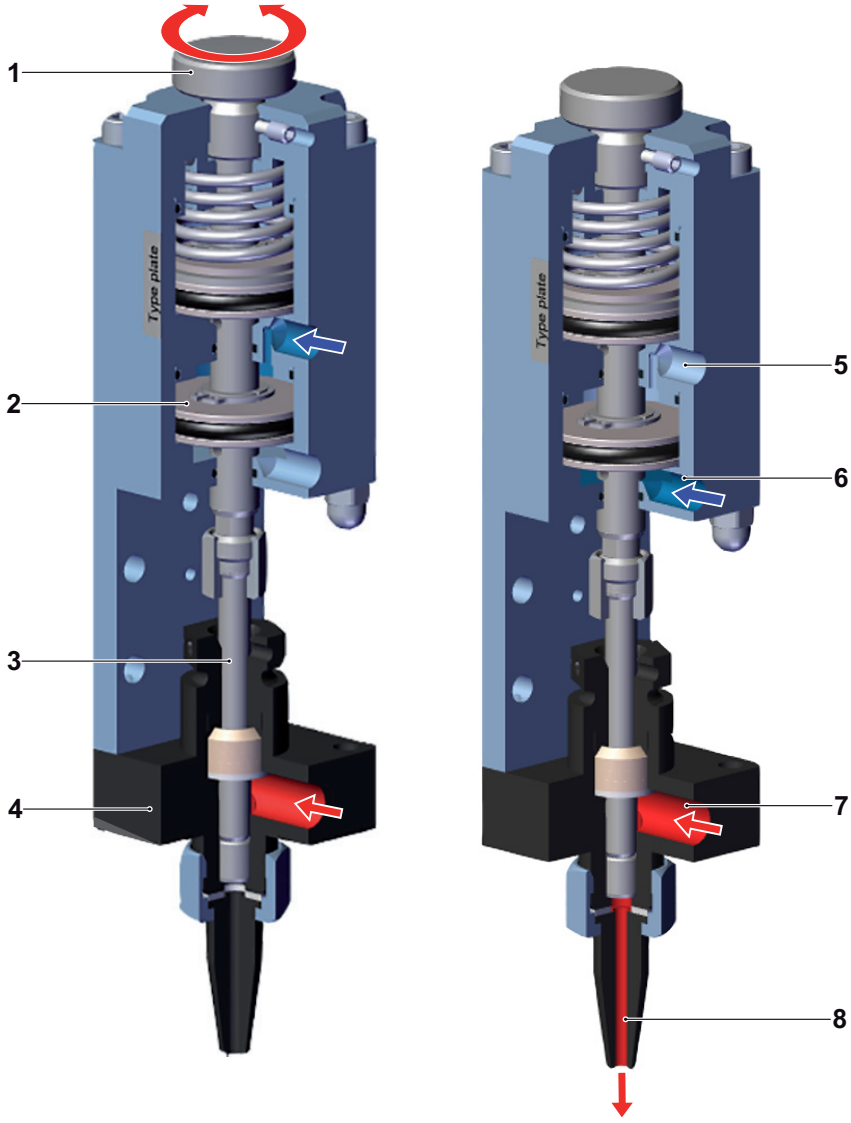
The module complies with the directives listed in the declaration of incorporation (see chapter *10 EC Declaration of incorporation (as per directive 2006/42/EC)*).

4 Overview and function

4.1 Basic function

Dispensing valves are used to discharge low to high-viscosity media. The size of the opening cross section is regulated by the stop screw of the valve needle. The sealing of the valve needle against the valve head area is carried out by means of an adjustable special seal. The valve consists of two structurally separate parts. The advantage of this separation is that material cannot enter into the drive cylinder and impair the movement of the valve needle. The material-carrying passage can be quickly and easily flushed if necessary.

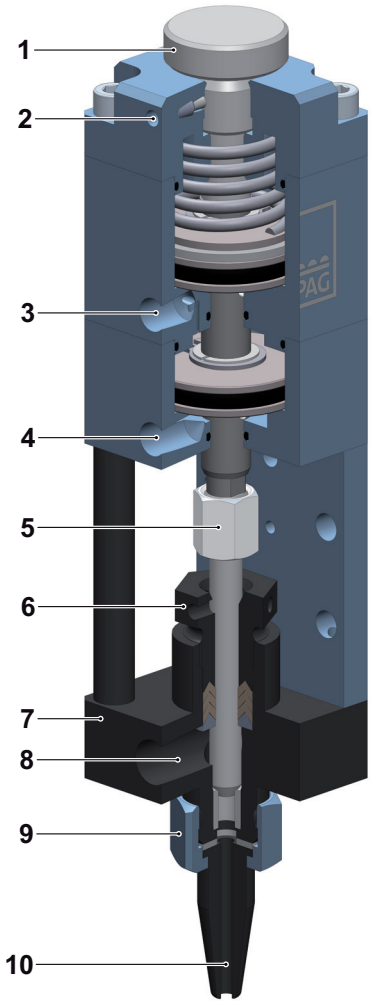
1 Stop screw (opening cross section)
2 Valve piston
3 Valve needle
4 Valve head
5 Control connection OPEN
6 Control connection CLOSED
7 Material inlet
8 Outlet nozzle (option)



4.2 Overview

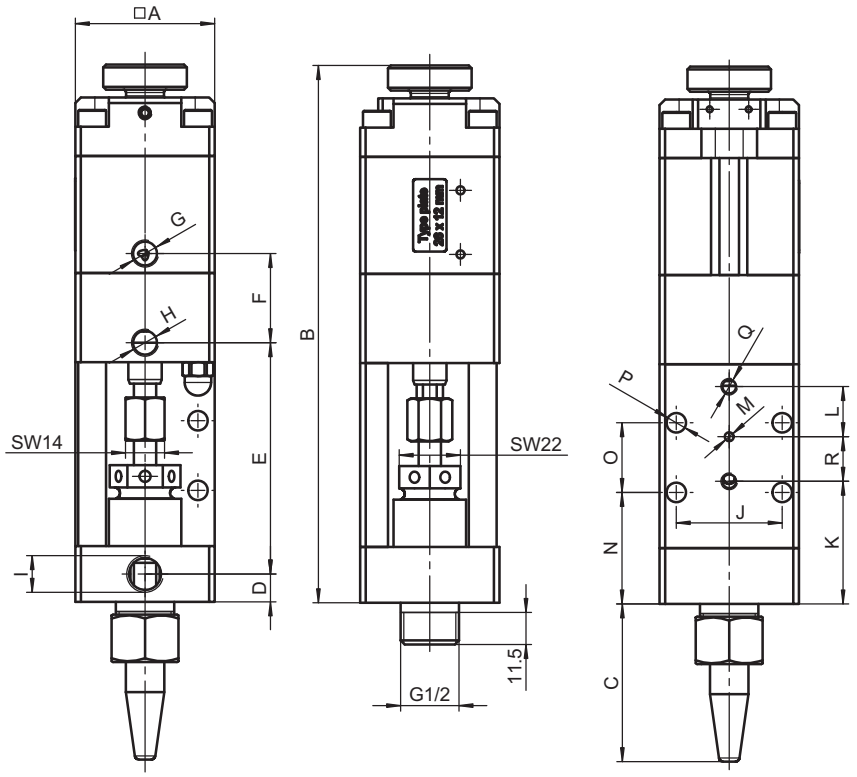
In these assembly instructions, additional options are described which are possibly not contained in the module supplied to you. These assembly instructions cover all possible versions and variants of this line of products.

1 Stop screw
2 Set screw/locking screw
3 Control connection OPEN
4 Control connection CLOSED
5 Coupling
6 Gland nut
7 Valve block
8 Material inlet
9 Spigot nut
10 Outlet nozzle/valve ball



4.3 Technical data

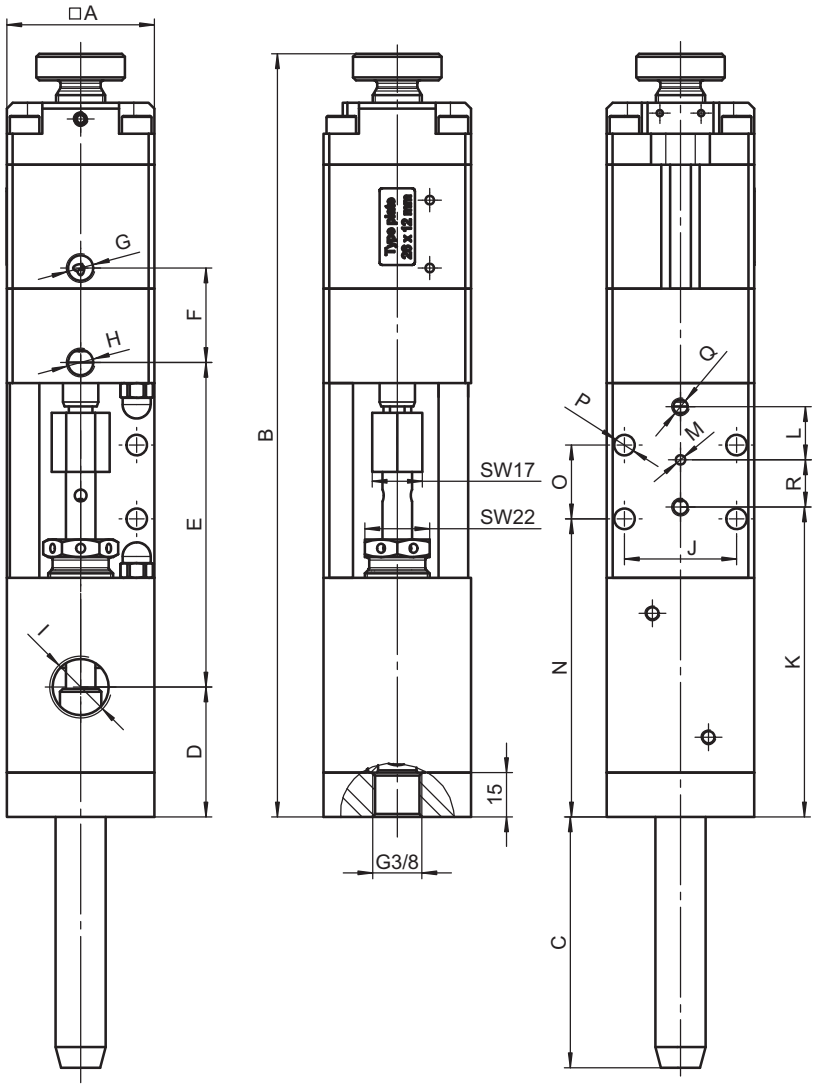
4.3.1 Dimensions



ID6

Type	A	B	C	D	E	F	G	H
401.23.00	50	200	57	10	83	32	G 1/8"	G 1/8"
401.23.01	50	200	57	10	83	32	G 1/8"	G 1/8"
401.23.02	50	200	57	10	83	32	G 1/8"	G 1/8"
401.23.05	50	200	57	10	83	32	G 1/8"	G 1/8"
401.23.70	50	200	57	10	83	32	G 1/8"	G 1/8"
401.01.32	50	200	57	10	83	32	G 1/8"	G 1/8"
1013784	50	200	57	10	83	32	G 1/8"	G 1/8"

Type	I	J	K	L	M	N	O	P	Q	R
401.23.00	G 1/4"	38	44	18	Ø 3.2	40	25	Ø 7	2x M6	16
401.23.01	G 1/4"	38	44	18	Ø 3.2	40	25	Ø 7	2x M6	16
401.23.02	G 1/4"	38	44	18	Ø 3.2	40	25	Ø 7	2x M6	16
401.23.05	G 1/4"	38	44	18	Ø 3.2	40	25	Ø 7	2x M6	16
401.23.70	G 1/4"	38	44	18	Ø 3.2	40	25	Ø 7	2x M6	16
401.01.32	2x G 1/4"	38	44	18	Ø 3.2	40	25	Ø 7	2x M6	16
1013784	G 1/4"	38	44	18	Ø 3.2	40	25	Ø 7	2x M6	16



ID 12

Type	A	B	C	D	E	F	G	H
401.03.04	80	285	85	44	112	87	G 1/4"	G 1/4"
401.23.03	50	242	85	44	110	32	G 1/8"	G 1/8"

Type	I	J	K	L	M	N	O	P	Q	R
401.03.04	G 1/2"	19	-	-	-	27	42	2x M5	-	-
401.23.03	G 1/2"	38	105	18	Ø 3.2	101	25	Ø 7	2x M6	16

4.3.2 Compressed-air connection

NOTICE

The components are provided with lifetime lubrication.

Once the product has been operated with lubricated air, it must always be operated with lubricated air during subsequent operation.

► So use non-lubricated air only.

Compressed air

Compressed air quality according to ISO 8573-1:2010 (Particles:Water:Oil)	Condition of the compressed air
7:4:4	In case of compressed air containing mineral oil
7:4:2	In case of compressed air containing bio oil
7:3:4	If the drive (pneumatic motor) has risk of freezing, compressed air containing mineral oil
7:3:2	If the drive (pneumatic motor) has risk of freezing, compressed air containing bio oil
Operating pressure	5-8 bar

Operation with lubricated compressed air

In case of lubricated compressed air, the additional lubrication must not exceed 25mg/m³ (ISO 8573-1:2010). The compressed air prepared downstream of the compressor must have the same quality as non-lubricated compressed air.

4.3.3 Types

The stability of the modules is defined according to the materials used. The definition is set out in general terms. The required properties must be previously matched with the material to be processed.

Mechanical stability of the closing elements and pistons

Property	Definition
No specific stability	Application for unfilled or non-abrasive media.
Increased stability	Application for slightly abrasive media. Parts are of hardened materials.
Wear-proof	Application for abrasive media. Parts are of carbide or have coated surfaces.

Chemical stability of the metals in contact with the material

Material	Property	Definition
Metals	No specific stability	Application for non-aggressive or non-acid media (pH 5-9). Parts of the valve are of aluminum or steel.
Metals	Increased stability	Application for aggressive media (pH 4-10). Parts of the valve are of stainless steel in A2 quality.
Metals	Stainless	Application for aggressive and acid media (pH 0-14). Parts of the valve are of acid-resistant stainless steel in A4 quality.

Material to be processed

Technical data	
Viscosity range	from 100 mPas to approx. 2,500,000 mPas
Max. permitted material temperature	80°C

Pressure specifications for ID6

DOPAG item No.:	Working pressure (p work)	Maximum pressure (p max)
401.23.00	250 bar	315 bar
401.23.01	250 bar	315 bar
401.23.02	250 bar	315 bar
401.23.05	100 bar	160 bar
401.23.70	100 bar	160 bar
401.01.32	250 bar	315 bar
1003784	250 bar	315 bar

Properties of ID6

DOPAG item No.:	Mech. stability	Chem. stability	Needle sealing type
401.23.00	increased stability	no specific	V sleeves
401.23.01	no specific	increased stability	V sleeves
401.23.02	increased stability	no specific	V sleeves
401.23.05	increased stability	no specific	Variseal
401.23.70	increased stability	no specific	Variseal
401.01.32	increased stability	no specific	V sleeves
1013784	wear-proof	no specific	V sleeves

Pressure specifications for ID12

DOPAG item No.:	Working pressure (p work)	Maximum pressure (p max)
401.03.04	250 bar	315 bar
401.23.03	100 bar	315 bar

Properties of ID12

DOPAG item No.:	Mech. stability	Chem. stability	Needle sealing type
401.03.04	increased stability	no specific	V sleeves
401.23.03	increased stability	no specific	V sleeves

4.3.4 Ambient conditions

Operation

Operation (without material)	
Air temperature	+ 5°C to + 40°C
Relative humidity	30% to 70%, no condensation

Transport and storage

Transport and storage (without material)	
Air temperature	- 25? to + 55?
Relative humidity	30% to 80%, no condensation

Material processing temperature

For all operations, the material must be brought to the correct processing temperature. This temperature is to be considered, if the material is taken out of cold storage.

Observe the temperature information on the data sheet provided by the material manufacturer.

4.3.5 Emissions

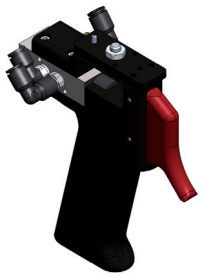
Emissions	
Emission sound pressure level at workplace LpA according to ISO 4871	75dB

5 Options

In these assembly instructions, additional options are described which are possibly not contained in the assembly supplied to you. These assembly instructions cover all possible versions and variants of this line of products.

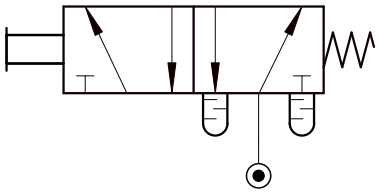
5.1 Pneumatic handle 401.03.50

When the pneumatic handle is actuated, it switches over a 5/2-way valve and triggers the material discharge.



Technical data	
Operating pressure	4-8 bar
Compressed air quality	lubricated or non-lubricated
Air connection	a Ø 6mm i Ø4mm
Valve air supply connection	a Ø 6mm i Ø4mm
Weight	0.37 kg

Functional diagram of the pneumatic handle 401.03.50

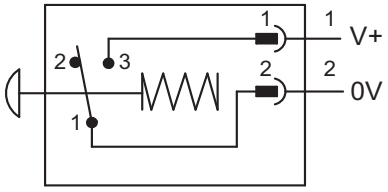


5.2 Electric handle 401.03.60

The handle with electric signal generator may be used together with the solenoid valve plate version.

Technical data	
Switching capacity	10-48VDC / 0.05-1.5 A
Function	NO contact
Weight	0.3 kg

Wiring diagram 401.03.60

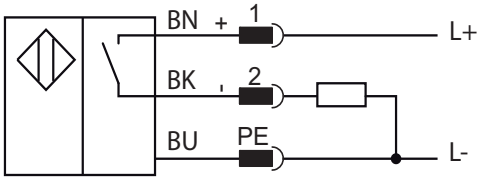


5.3 Electric handle 401.03.66

The signal may be processed by a superordinate control unit.

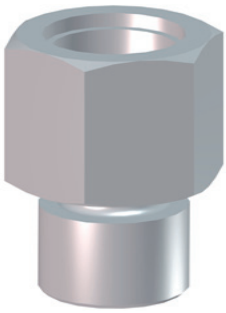
Technical data	
Switching function	NO contact, PNP
Operating voltage	10-30 V DC
Output current max.	200 mA for 24VDC
Weight	0.3 kg

Wiring diagram 401.03.66



5.4 Outlet adapter

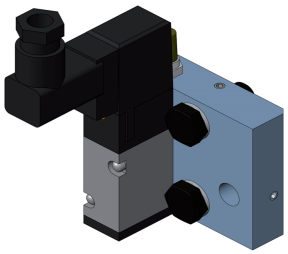
Connection nipple for material outlet. Suitable for dispensing valve with G 1/2" thread.



Item	DOPAG item No.
Nipple iG 1/2" / aG1/2", 60°	500.00.15
Nipple iG 1/2" / aG1/4", 60°	500.00.06

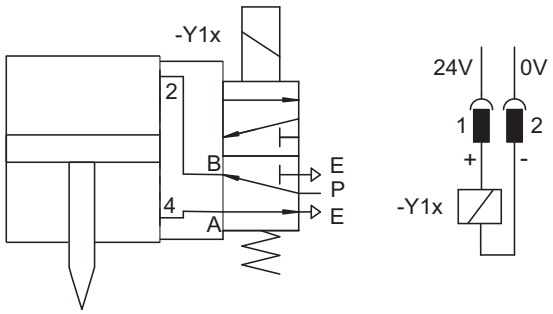
5.5 Solenoid valve plate 1007361

The solenoid valve plate enables the use of the valve with a robot or an electric handle.

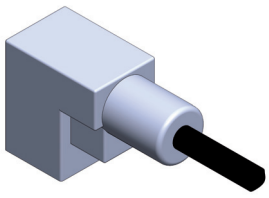


Technical data	
Air connection	G 1/8"
Compressed air	4 - 8 bar
Operating voltage	24 V DC
Condition of the compressed air	lubricated or non-lubricated (*4.3 Technical data*)
Hole pitch of cylinder connection	32 mm
Electrical connection	Type CI industrial connector

Functional diagram 1007361

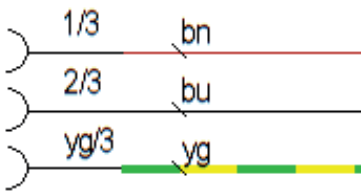


Cable including connector



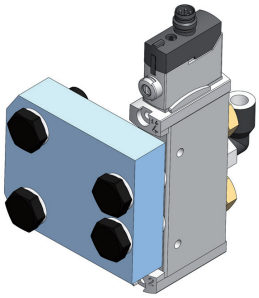
Technical data	
Type	CI, contact gap 9.4 mm
Protection circuit	Suppressor diode
Nominal voltage	24 V AC/DC
Power consumption	4 mA
Connection cable type	PUR / PVC 3x0.5 mm²
Connection cable	Length 10 m, Ø 5 mm

Wiring diagram 1000631



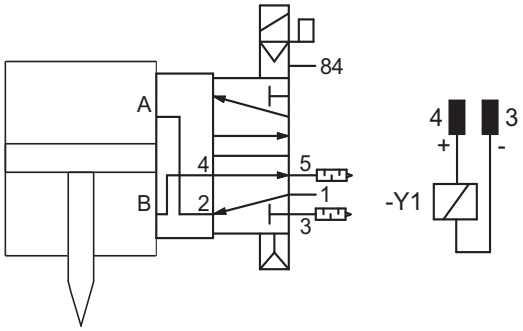
5.6 Solenoid valve plate 1012065

The solenoid valve plate enables the use of the valve with a robot or an electric handle.



Technical data	
Air connection	a Ø 6mm i Ø 4mm (G 1/8")
Compressed air	4 - 8 bar
Operating voltage	24 V DC
Condition of the compressed air	lubricated or non-lubricated (*4.3 Technical data*)
Hole pitch of cylinder connection	32 mm
Electrical connection	3-pin M8 x 1 connector

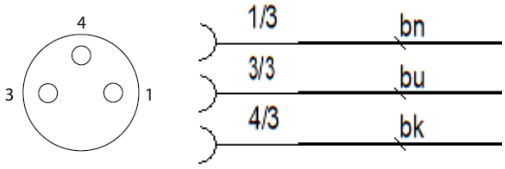
Functional diagram 1012065



Cable including connector

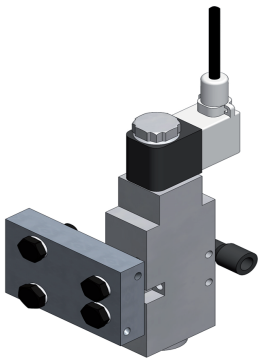
Technical data	
Type	M8 x 1, 3 pins
Nominal voltage	24 V AC/DC
Connection cable type	PUR / PP 3x0.25 mm²
Connection cable	Length 10 m, Ø 4.4 mm

Wiring diagram 29.01.238



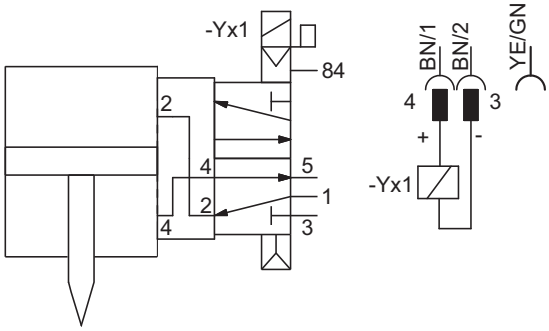
5.7 Solenoid valve plate 1007297

The solenoid valve plate enables the use of the valve with a robot or an electric handle.

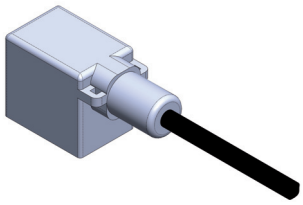


Technical data	
Nominal diameter, compressed air	a Ø 8mm i Ø 6mm (G 1/8")
Compressed air	4 - 8 bar
Operating voltage	24 V DC
Condition of the compressed air	lubricated or non-lubricated (*4.3 Technical data*)
Hole pitch of cylinder connection	32 mm
Electrical connection	Type B connector

Functional diagram 1007297

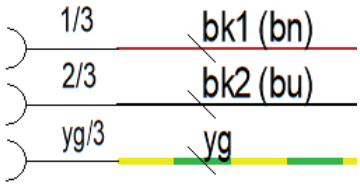


Cable including connector



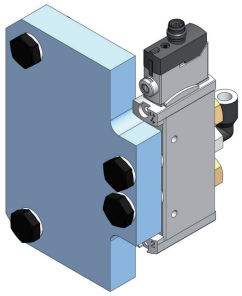
Technical data	
Type	B, contact gap 10 mm
Display	Suppressor diode
Nominal voltage	24 V AC/DC
Connection cable type	PVC / PVC 3x0.75 mm²
Connection cable	Length 10 m, Ø 5.9 mm

Wiring diagram 29.01.292



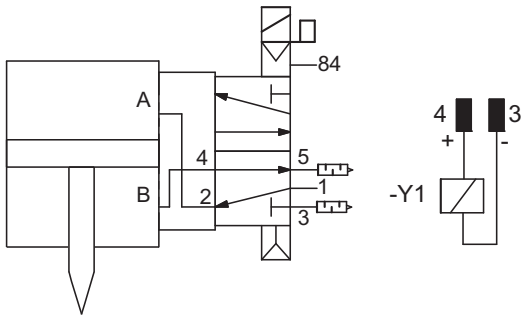
5.8 Solenoid valve plate 1010839

The solenoid valve plate enables the use of the valve with a robot or an electric handle.



Technical data	
Air connection	a Ø 6mm i Ø 4mm (G 1/8")
Compressed air	4 - 8 bar
Operating voltage	24 V DC
Condition of the compressed air	lubricated or non-lubricated (*4.3 Technical data*)
Hole pitch of cylinder connection	87 mm
Electrical connection	3-pin M8 x 1 connector

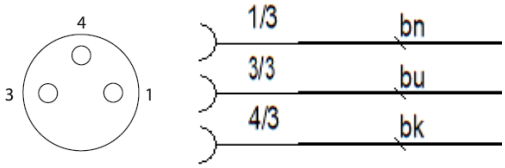
Functional diagram 1010839



Cable including connector

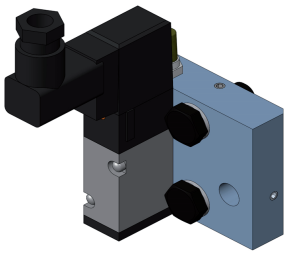
Technical data	
Type	M8 x 1, 3 pins
Nominal voltage	24 V AC/DC
Connection cable type	PUR / PP 3x0.25 mm²
Connection cable	Length 10 m, Ø 4.4 mm

Wiring diagram 29.01.238



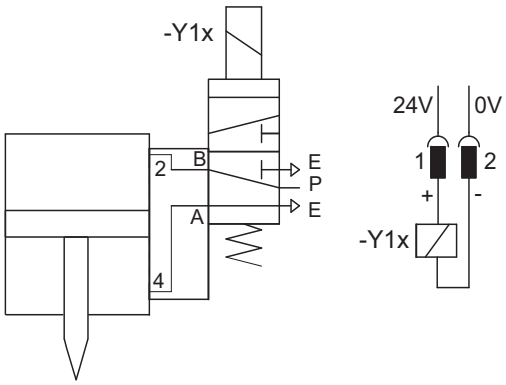
5.9 Solenoid valve plate 100.55.19

The solenoid valve plate enables the use of the valve with a robot or an electric handle.

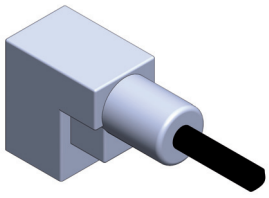


Technical data	
Air connection	G 1/8"
Compressed air	4 - 8 bar
Operating voltage	24 V DC
Condition of the compressed air	lubricated or non-lubricated (*4.3 Technical data*)
Hole pitch of cylinder connection	87mm
Electrical connection	Type CI industrial connector

Functional diagram of 100.55.19

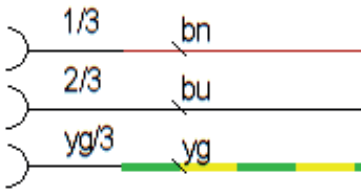


Cable including connector



Technical data	
Type	CI, contact gap 9.4 mm
Protection circuit	Suppressor diode
Nominal voltage	24 V AC/DC
Power consumption	4 mA
Connection cable type	PUR / PVC 3x0.5 mm²
Connection cable	Length 10 m, Ø 5 mm

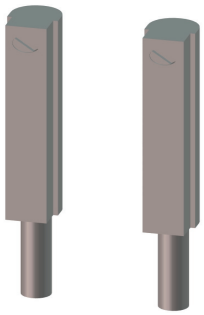
Wiring diagram 1000631



5.10 Signal generator set

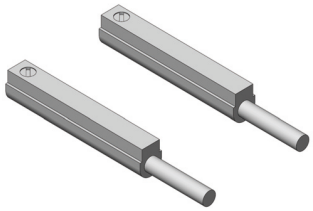
Sensors for monitoring the valve needle stroke.

131862 including M8 x 1 connector

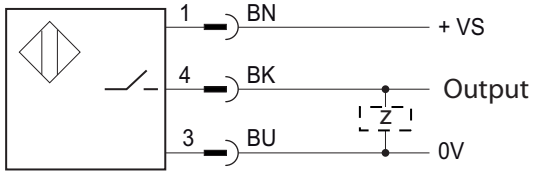


Technical data	
Function	Magneto-resistive
Output circuit	PNP
Switching function	NO contact
Power consumption max.	12 mA
Output current max.	< 200 mA
Operating voltage	5-30 V DC
Protected against polarity reversal, short-circuit proof	Yes
Cable length	5m

131861 with 5m cable



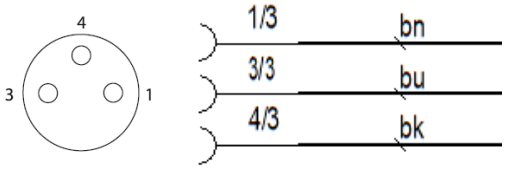
Wiring diagram



Cable including connector

Technical data	
Type	M8 x 1, 3 pins
Nominal voltage	24 V AC/DC
Connection cable type	PUR / PP 3x0.25 mm²
Connection cable	Length 10 m, Ø 4.4 mm

Wiring diagram 29.01.238



6 Assembly

6.1 Transportation

The module is packaged and delivered by the manufacturer in a proper manner. It is protected for transport and against weather conditions, and provided with suitable packaging materials.

Transport the module to the application site in packaged condition if possible and only remove package before first use. The packaging protects the module.

6.2 Removing packaging

Disposal

All packaging material must be removed with care. Packaging material must be disposed of in the correct manner (see chapter *9 Disposal*).

Warranty conditions

The module must be checked for damage that may have occurred in transit. If damage is found, then the warranty conditions must be observed. The warranty conditions are described in the sales documents.

6.3 Installation

The module has been designed for operation in spaces that are protected from weather effects. Operation and storage in an environment containing aggressive substances or too high humidity or outdoors will result in corrosion damage, for which the manufacturer does not assume liability.

6.4 Connection

Dispensing valve

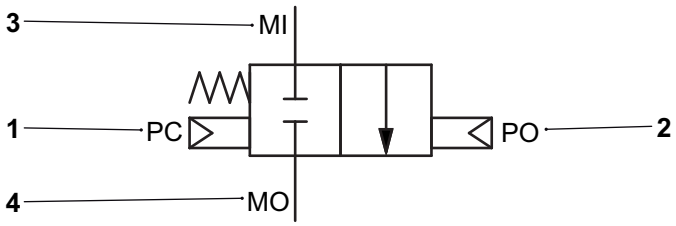
NOTICE

Mind the material inlet!

Swapping the material connections can cause loss of valve functionality.

► Observe the installation direction.

1 PC - control air (close)
2 PO - control air (open)
3 MI - material inlet
4 MO - material outlet



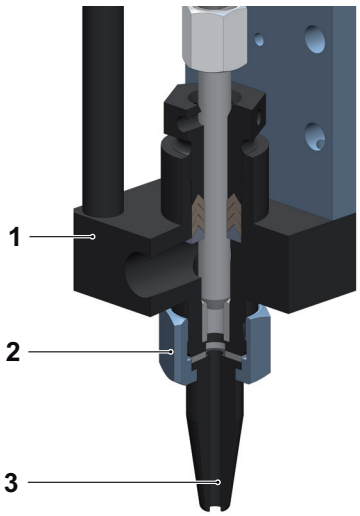
The installation position can be selected arbitrarily and has no influence on the function.

6.5 Installing the outlet nozzle

For production purposes, install an outlet nozzle or an outlet adapter on the dispensing valve. Outlet nozzles are installed on the outlet system using a spigot nut. Outlet adapters used to connect a hose are installed directly on the outlet head. *5.4 Outlet adapter*

Please note that the material may harden inside the outlet nozzle in case of long inactive periods. Disassemble and clean the nozzle before inactive periods or replace it by a new outlet nozzle before resuming production.

1 Outlet head
2 Spigot nut
3 Outlet nozzle

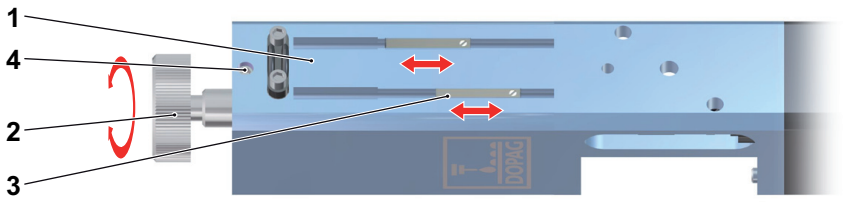


6.6 Setting the dispensing valve

The size of the opening cross section is regulated by the stroke adjustment of the valve needle. The stroke adjustment can be secured with the locking screw. The stroke scanning signal generator must be adjusted when the valve stroke is changed.

Adjust the valve stroke

1 Dispensing valve
2 Stroke adjustment
3 Signal generator
4 Locking screw



NOTICE

The material passage should be regulated on the stroke adjustment device in the rest position only.

If the drive's piston is pressed against the stopper, it is difficult to regulate the material passage with the adjusting screw.

► Adjust the valve only when it is not actuated.

Setting

► Loosen the locking screw.
► Adjust the valve stroke.
► Tighten the locking screw.
► Adjust the signal generator (optional) to its new end position.
  • The LED illuminates continuously.

When carrying out adjustments, the size of the opening cross section must be adapted to the process requirements.

6.7 De-aerating the dispensing valve

The dispensing valve must be de-aerated during commissioning and after carrying out works on the superordinate system as well as each time after loosening the pipe fittings of material-carrying components. Air in the system causes metering errors.

⚠ WARNING

Risk of splashing during de-aeration!

The material is released under high pressure and spraying may occur due to entrapped air!

► Always wear eye protection and protective gloves! Observe the material manufacturer's safety information.

De-aerating the dispensing valve

The outlet opening (hose or dispensing valve) must be positioned at the highest possible point. The air can rise upwards and escape. Depending on material viscosity, this procedure may take some time.

► Open the dispensing valve and wait until material free from air bubbles starts coming out.

7 Maintenance

7.1 General

Maintenance work must be undertaken by properly trained maintenance staff (*2.3 Target audience*).

DANGER

Danger arising from maintenance work!

If you undertake maintenance work without having received the necessary training, system safety is no longer guaranteed. This can cause serious physical injury or death.

► Observe all safety instructions and leave maintenance to trained staff.

WARNING

Danger from high pressure!

Risk of injuries when working on modules and machine parts which have not been depressurized.

► Material and air pressure must be released when carrying out work. No residual pressure may exist. The compressed-air connection of your superordinate module/system must be removed.

7.1.1 DOPAG Service

Please note the Service Center responsible for your area. For current addresses, go to www.dopag.com.

7.1.2 Operating material and lubricants

Consumables can be ordered directly from DOPAG Service. DOPAG recommends the following operating materials and lubricants:

Pneumatic and hydraulic oils

DOPAG pneumatic oil	Container	DOPAG article no.
Castrol Hyspin AWS 22	1 liters (plastics)	26.05.012

Other manufacturers:

Manufacturer	Pneumatic oils Temperature range 0 – 30 °C Viscosity ISO-VG22	Hydraulic oils Temperature range 0 – 30 °C Viscosity ISO-VG46
ARAL	Vitamin GF 22	Vitamin GF 46
BP	Energol HLP-HM 22	-
ESSO	Nuto H 22	Nuto H 46
MOBIL	-	DTE 15M
SHELL	Tellus 22	Tellus 46
TEXACO	Rando HD 32	Rando HD 46

Sealing liquid

For filling the seal chambers, DOPAG recommends Mesamoll sealing liquid. For silicone applications, we recommend silicone oil.

SL designation	Container	DOPAG article no.
Mesamoll	1 liters (plastics)	26.05.010
Mesamoll	5 liters (plastics)	26.05.011
Silicone oil	50ml (plastics)	26.05.009

Greases

The greases used for maintenance are shown in the enclosed parts lists with their abbreviation.

Use the grease gun supplied with the machine (optional) for maintaining the grease nipples.

SL designation	Product	DOPAG article no.
LU01	Molykote DX Paste	90.02.001
LU02	Blasolube 463 (grease gun)	90.02.002
LU03	Bathan KF 1 / 100M	90.02.003
LU04	Vaseline	90.02.004
LU05	Copper paste	90.02.005
LU06	Grease paste Molykote G-2003	90.02.008
LU07	Precision Silicone Spray	90.02.022
LU08	Klüber Syntheso GLEP 1	90.02.023
LU09	Anti seize paste	1003012
LU10	Mesamoll grease	22023865
LU11	K48-Staburags-NBU-30	22037129

Solvent

DOPAG recommends careful cleaning of the adhesive surface before parts are stuck together.

SL designation	Container	DOPAG article no.
Uni-Clean 10	1 liter (aluminum vessel)	26.05.018
Resin-Clean	1 liter (aluminum vessel)	26.05.019

Adhesive

The adhesives used for maintenance are shown in the enclosed parts lists with their abbreviation.

SL designation	Product	DOPAG article no.
GL01	omniFIT FD 10	53.09.010
GL02	Loctite 275, Activator 7649 ("old" - omniFIT 58H)	1019892 / 53.09.012
GL03	Three Bond 1305, strong	53.09.001
GL04	Three Bond 1344 soft	53.09.002
GL05	Three Bond 1373B	53.09.003
GL06	Loctite 603	53.09.004
GL07	Loctite 648	53.09.005
GL08	Loctite 326, Activator 7649	53.09.006 / 53.09.012
GL09	Anti seize paste	1003012
GL10	-	-
GL11	Araldit AW 106 MPHärter HV 953 U MP	A: 53.09.015 B: 53.09.016
GL12	-	-
GL13	Loctite Epoxy Adhesive	22035683
GL14	Loctite 270	1005330
GL15	Loctite 242	1017718
GL16	Ergo 4252	22024418
GL17	WÜRTH assembly adhesive	1017719
GL18	Acrylic assembly adhesive	1017720
GL19	Araldit 2012 C	1019060

7.2 Maintenance of the modules

7.2.1 Maintenance schedule

To ensure trouble-free operation, the following maintenance intervals must be observed for the module:

A device can be rented to carry out the maintenance work. For this purpose, please contact our *7.1.1 DOPAG Service*.

Maintenance task	Interval
Visual inspection	daily
Cleaning	daily
Check/readjust the metering quantity	daily/adapt according to operation

In principle, the module requires little maintenance. If, however, liquids that may cause sedimentation in the module are used, it is necessary to clean the module.

7.2.2 Visual inspection

The following points must be checked:

- Are all safety systems still available and fully functional?
- Are all safety and danger warning information as well as the labels available and clearly legible?
- Are all the connecting couplings still tight?
- Are all cable connections tight and undamaged?
- Are there signs for heating on movable parts, for example caused by too much friction?

7.2.3 Cleaning

The module should be cleaned daily and immediately if it is contaminated with material. Dried material is very difficult to remove and requires a great effort.

DANGER

Danger of explosion when using solvents!

When using solvents based on halogenated hydrocarbons, such as trichloroethane, chemical reactions can be caused on aluminum and on galvanized parts. The parts can oxidize and be destroyed as a result. In extreme cases, the reaction can occur in an explosive manner.

► Do not use any solvents based on halogenated hydrocarbons.

NOTICE

Wrong cleaning agent for cleaning the module.

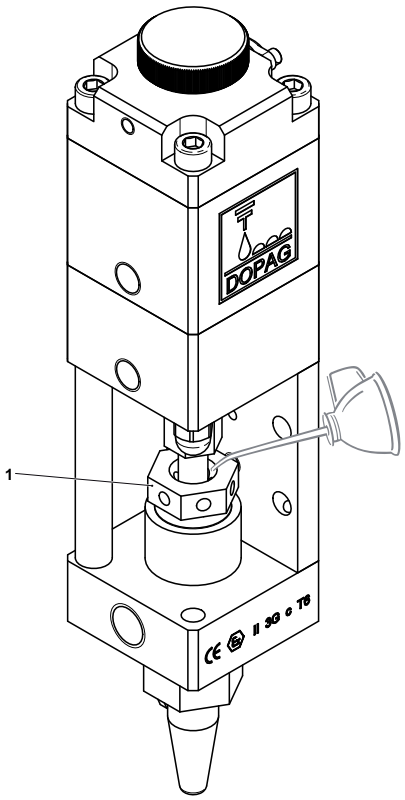
Under no circumstances must the module be sprayed with water.

► Determine which cleaning agent to use from the material used, and clean the module as environmentally friendly and with as much care as possible.

7.2.4 Adjustable seals

Dispensing valves can come equipped with an adjustable seal. During the first week of operation, adjustable seals must be tightened continuously until they are correctly run-in. Afterwards, the seals must be re-tightened weekly. A few drops of oil or sealing liquid added to the seal chamber will prolong the seal's service life. Seal leakage can be reduced by tightening the adjusting nuts, however, it cannot be reduced entirely. If after adjustment the leakage is still excessive, the seal must be replaced.

1 Adjustable seal



Adjustment

- ▶ The seal must be tightened with the adjusting nuts.
- ▶ Insert an appropriate tool (e.g. a punch) into the hole for tightening.

NOTICE

The material passage should be regulated on the stroke adjustment device in the rest position only.

If the drive's piston is pressed against the stopper, it is difficult to regulate the material passage with the adjusting screw.

- ▶ Adjust the valve only when it is not actuated.

A certain un-tightness is allowable by design without the need to change the seals Should seal leakage occur, a 100% tightness will no longer be achieved by retightening. Exercise care as overtightening can adversely affect functional operation.

7.2.5 Troubleshooting

This list gives information on possible module faults and how they can be solved.

Faults / Troubleshooting

Fault	Causes	Remedies
Dispensing valve delivers no or not enough material although it switches.	The delivery pump does not deliver any material.	Observe operating instructions of delivery pump
	Material pressure is too low	Increase the material input pressure
	Stop screw for metering quantity excessively closed	Open stop screw for metering quantity
	Outlet clogged	Clean or replace outlet, cannula or adapter
Dispensing valve is leaking	Seals are damaged	Replace seals
	Excessive wear on moving parts and closing components	Replace seals and worn parts
	Excessive input pressure	Reduce pressure to a value below the maximum pressure; see type plate
Volume flow of the material outlet changes during operation	Stroke adjustment has changed	Re-set stroke adjustment
Discharge volume too small	Valve piston does not reach stop screw	Increase switching time
Dispensing valve does not switch	Control ports are not pressurized alternately with pneumatic pressure	Check control signals for alternate supply and deaeration of the opposite side
	Pneumatic pressure too low	Increase pneumatic pressure
Solenoid valve plate is not supplied with power	Solenoid valve is damaged	Check electrical connection, Replace solenoid valve

Fault	Causes	Remedies
Material dripping at the outlet	Valve seat leaking	Clean or replace replace valve seat incl. seal set
	Outlet cannula produces excessive back pressure and the material expands due to slow depressurization	Use larger outlet cannula
	Air rises in outlet cannula due to capillary action	Use smaller outlet cannula
	By installing adapters or hoses downstream of the dispensing valve, large residual quantities occur that are relieved and expand at standstill	Keep residual quantities as small as possible
	Material pressure is not discharged during longer standstill	Discharge material pressure at standstill
	Dispensing valve not switched to position PC 'Close'	Adjust control connection PC 'Close' during longer standstill
	Pressure spring in drive cylinder broken	Replace pressure spring
Signal generator does not send a signal	Sensor position has shifted	Re-adjust sensor position
	Cable breakage	Replace cable
	Faulty sensor	Replace sensor
	Sensor connected incorrectly	Check electrical connection
	Dispensing valve does not switch	See under faults
Permanent signal from signal generator	Metering stroke not large enough for sampling	Increase metering stroke and set sensor
	Material flows although valve is closed	De-aerate valve, material contains air

If the problem cannot be solved, please contact DOPAG Service, www.dopag.com.

8 DOPAG spare parts

DANGER

It is dangerous to use incorrect spare parts!

Using spare parts that have not been tested and approved by DOPAG means that system safety is not guaranteed. This can cause serious physical injury or death.

► Use DOPAG spare parts only.

Storing the most important spare parts and parts subject to wear on the installation site is an important prerequisite for continuous operation and operational readiness of the machine or of the module supplied. If you have any question concerning the recommended spare parts, please contact DOPAG Service.

You will find the spare parts on the service documentation and they can be ordered at DOPAG Service.

In case a component leaks, DOPAG recommends replacing all seals of the seal set in question. If the machine is subjected to high loads, the spare parts kit is recommended. In addition to the seal set, it comprises components required for maintenance such as spring, ball and valve seat.

For the DOPAG Service being able to deal with your order, please give the following order details.

Order details	Example
Designation	Seal set
DOPAG art. no.:	450.00.00.01
Number of items	1

Revision

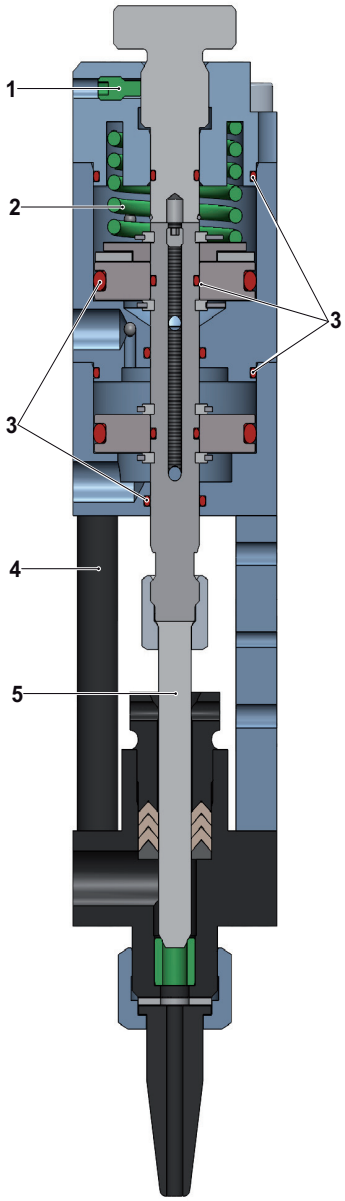
The dispensing valve must be checked on a regular basis. Replace all seals and parts with signs of wear. The frequency required for inspection depends on the operation and on the material used. Drive cylinders and outlet head are handled separately due to their different wear characteristics.

The seal set includes all seals required for the module. The spare part kits include the seal set and wear parts as well as parts which are not worth cleaning.

In case a component leaks, DOPAG recommends replacing all seals of the seal set in question. If the machine is subjected to high loads, the spare part kit is recommended. In addition to the seal set, it comprises components required for maintenance such as spring, ball and valve seat.

Spare parts

1 Set screw
2 Pressure spring
3 Seals
4 Valve head compl.
5 Valve needle



Scope of delivery

Item	Seal set	Spare parts
Seals compl.	X	X
Set screw	-	X
Pressure spring	-	X
Valve head compl. (according to type)	X	X
Valve needle	-	X

Seal set
spare part kit

DOPAG item No.:	Seal set	Spare part kit
401.01.32	401.01.32.01	401.01.32.02
401.03.04	401.03.04.01	401.03.04.02
401.23.00	401.23.00.01	401.23.00.02
401.23.01	401.23.01.01	401.23.01.02
401.23.02	401.23.02.01	401.23.02.02
401.23.03	401.23.03.01	401.23.03.02
401.23.05	401.23.05.01	401.23.05.02
401.23.70	401.23.70.01	401.23.70.02
1013784	1013784.01	1013784.02

DOPAG offers training on maintenance and inspection. Please contact DOPAG Service for this purpose (*7.1.1 DOPAG Service*).

Note that all parts of the spare parts list may also be ordered individually.

9 Disposal

Check the reusability value of materials and system parts prior to disposing of them. Recycle the raw materials whenever possible.

Careless or incorrect disposal can result in unforeseen consequences. Be concerned about yourself and us, our future generations, nature, the environment and the economy. Materials and system parts should be disposed of in a manner that is proven to be harmless to humans, nature and the environment. Always observe the local regulations and directives.

Dispose of elements and module parts separately according to the type of material:

- Dispose of packaging material in an environmental-friendly manner.
- Non-ferreous metal
- Iron
- Electronic systems and components
- Plastics
- Organic substances, such as timber

Send the raw materials for recycling wherever possible.

Hazardous waste

NOTICE

Please observe the correct disposal of toxic substances and materials.

⚠ CAUTION

Observe the disposal!

Improper disposal may cause substantial harm for humans and environment.

► It is mandatory to correctly dispose of the used materials according to the material manufacturer's instructions.

For an appropriate disposal by the manufacturer, please fill in the Declaration of Contamination correctly. For the Declaration of Contamination, go to www.dopag.com.

10 EC Declaration of incorporation (as per directive 2006/42/EC)

We, the manufacturers of the partly completed machinery, declare that the following machine is in conformity with the directives listed below and that the mentioned standards were referred to.

This partly completed machinery may only be commissioned after assertion that the machine in which it is due to be installed, complies with the directive 2006/42/EC standards.

Manufacturer

DOPAG Dosiertechnik und Pneumatik AG
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