USER INFORMATION

KEEP FOR FUTURE USE

Rev. A

6000362E

B. 6.50.75



Diaphragm Pump No. 003.075-DP

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REGULAR TESTING OF THE APPLIANCES

Test certificate No	Test date	Person responsible	
	1031 date	Company	Name

Fluid spraying equipment is intended in particular for surface coating (e.g. paint spraying equipment).

The operator must ensure that the fluid spraying equipment is tested for proper operation after an operating pause of more than 6 months, and at least every 12 months by a <u>competent person</u>¹.

The operator must ensure that the <u>test results</u> are properly recorded in writing for each spray unit ² and kept until the next test.

The operator must ensure that the test certificate is available at the <u>place of use</u>³⁾ of the fluid spraying equipment.

- ¹⁾ <u>A competent person</u> is somebody that has sufficient knowledge in the field of fluid spraying equipment based on professional training and experience, and is sufficiently conversant with the relevant national health and safety regulations, accident prevention regulations, recommendations and generally accepted rules and industrial norms to evaluate fluid spraying equipment.
- ²⁾ <u>Written records</u> (test results) can, for example, be in the form of test certificates.
- ³⁾ <u>At the place of use</u>, a copy of the test certificate or a test stamp on the appliance is considered as in compliance with the requirement.

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Ensure that all other users know and understand all safety directions.

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REPLACEMENT DIAPHRAGM PUMPS REPLACEMENT ACCESSORIES B.6.50.7	75-A
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TEST CERTIFICATE (final inspection)	
EU DECLARATION OF CONFORMITY	
BRIEF USER INSTRUCTIONS (can be adhered to pump)	
BRIEF OPERATING INSTRUCTIONS, WARNING SIGNS	
CORRECT USE	
Diaphragm pumps 003.075-DP are exclusively manufactured for common applications in surfaci	ng
technology (to convey coatings or auxiliary agents or for spraying) or similar work.	-
Any other purpose above and beyond this, is considered as incorrect use. We are not liable for a	ıny
damage or injury resulting from this; the user will bear sole liability in such cases.	
Correct use includes following operating, maintenance and inspection conditions and regulations laid down by us.	;
003.075-DP diaphragm pumps may only be used, maintained and repaired by personnel familiar with, and trained to recognize the inherent dangers.	

The relevant accident prevention regulations as well as safety and medical rules must be respected.

Unilateral changes to the appliance will cause us to waive our responsibility for any damage or injury caused.

The user is responsible for the correct installation of the equipment.

FUNCTIONAL DIAGRAM



DESCRIPTION OF FUNCTIONS

The air pressure is supplied to the diaphragm pump (A) from a pressure tank (1) via a pipe or hose (2) and a pressure control value (3). The air supply from the pressure tank to the diaphragm pump can be interrupted by the ball value (4).

The ball valve (5) is used to release condense water manually (an automatic moisture trap is recommended here).

The safety valve (6) protects the pressure tank against inadmissible rise in air pressure (e.g. when heated).

There is another (required) safety value (7) in the diaphragm pump, because the compressed air supply (B) is not only installed for the diaphragm pump.

During operation, compressed air escapes from the propulsion chamber of the diaphragm pump through the integrated (sound absorber (8) into the atmosphere. This relieves the pressure.

The fluid (coating or auxiliary agents) is sucked out of a fluid container (9) into the diaphragm pump through the suction line (10) and supplied under pressure to the dispenser (gun) via the pressure line (hose/tube) (11).

A strainer ① protects the diaphragm pump against foreign substances which unintentionally entered the fluid.

EQUIPMENT COMPONENTS – IMPORTANT INFORMATION

The following components are required in an operational system:

(A) DIAPHRAGM PUMP

For a description of diaphragm pump functions, see "Technical Product Description B.6.50.75-P".

(B) THE COMPRESSED AIR SUPPLY

The compressed air supply consists of a compressor, a pressure tank with moisture trap, an optional compressed air drier and a compressed air line. As a rule, the user provides the compressed air supply. The air pressure supply is in general provided by the user.

- When compressed air supply needs to be installed, the relevant accident prevention regulations, safety rules and user information must be respected, in particular the information supplied by the compressor manufacturer.

There must be a flexible connection between the diaphragm pump and the compressed air line (to avoid injuries caused by rupture). A hose line is most <u>suitable</u>.

- Rated diameter 8 or more

- Working pressure = max. mains pressure, preferably \geq 16 bar

- Air and ambient temperatures -20° to +50 °C

- Free from any substances that may interfere with paint spraying, like silicone

In locations with explosion hazards, the compressed air line and hose line must be electrically conductive (to avoid electrostatic charging).

- Leakage resistance to earth < $10^6 \cdot \Omega$

In most cases, the pressure-regulating valve is installed directly on the diaphragm pump.

- Efficient flow rate at 6 bar and 25 m/s > 30 m³/h

- Air inlet pressure 10 bar

- Air and ambient temperatures 0° to 50 °C

The pressure regulation valve can be situated between the hose line and the compressed air line.

The gauge 3.1 in the functional diagram enables accurate adjustment and monitoring of the necessary air pressure.

- Display range 0 to 16 bar
- Air and ambient temperatures 0° to 50 °C
- Construction is dampened

A <u>shut-off mechanism (e.g. a ball valve</u>) should always be installed between the pressure regulation valve and the hose line, or between the hose line and the compressed air line. This enables quick and safe switch-off of the diaphragm pump for operational breaks, maintenance work and in cases of errors.

There is no change to the value set on the pressure control valve.



Never open and close the shutoff valve suddenly.

- Nominal pressure 16 bar, material CuZn, nickel-plated



The rule for ball valves: wings (tap wrench) transverse to flow direction = Line is closed off.

Do not use PTFE tape or hemp to <u>seal connections</u> (malfunctioning of pressure regulation valve - as a result of PTFE or hemp residues in the compressed air supply).

There are no special requirements for the <u>quality of the compressed air</u> supplied to the diaphragm pump.

- Condense and residue oil from the compressor are separated mechanically (Pressure tank, compressed air filter)
- Lubrication of compressed air is not required
- Temperature of compressed air 10° C to +40° C

In painting processes the compressed air must be free of substances that could lead to the formation of craters (oil, silicone).

- This also applies to component parts of the air pressure supply.

© AIR EXHAUST SOUND ABSORBER

Without a <u>sound absorber</u> the sound emission of an air-powered diaphragm pump is damaging to hearing. All diaphragm pumps come with an integrated sound absorber. As there is a direct relationship between sound absorption and the formation of ice on the diaphragm pump controls, the sound absorber cannot be used to reduce the sound pressure level to any desired level [not to \leq 70 dB(A)].

See "Technical Description B.6.50.75-P", page 4, for more detailed information on the sound level.



Do not use the diaphragm pump without its sound absorbing components.The decision to wear ear protection depends on the operating pressure and the resulting sound level.

D FLUID SUTION SYSTEM

The suction connector of the diaphragm pump allows the installation of a pivoting connector (1); it is also possible attach a suction tube (2).



Use the connector to install a suction assembly or a suction tube. The suction tube has a threaded end.

All metal parts in contact with the suction area material are made of austenitic stainless steel.



Most of the diaphragm pumps are equipped with the connection unit (1) and a suction system (3) (suction hose, tube and suction strainer).

The swivel connector enhances the flexibility of the suction hose so an almost empty fluid container will not be turned over by the recoil force of the suction hose.

Fig. 4

The inner diameter of the suction line allows fluids with a kinematic viscosity of up to 750 mm²/s (cSt) to be drawn out by the diaphragm pump without difficulty.

A higher viscosity rating can result in reduced suction performance, or even interrupted suction, identifiable by an increasing pressure drop during the change of direction (pulsating pressure).

- Measures for improvement are:

Suction line/suction hose with a larger diameter, shorter suction hose.

Specifications of suction assembly:

- Electrically conductive, maximum permissible resistance 3 x 10⁴/m (tested to ISO 8031) and leakage resistance to earth $< 10^6 \Omega$. (Suitable for use in locations with explosion hazards.)
- The individual parts of the suction system are designed to withstand an overpressure of 8 bar. (Suitable for suction heights of up to 6 m.)
- The suction hose and the strainer are silicone-free and resistant to the usual solvents used in surface coating.
- Minimum rated diameter 19.
- Fluid temperature 10 °C to 85 °C.
- Screen mesh size: 1.8.



The connection between diaphragm pump and fluid container must be flexible (to avoid rupture caused by vibration) in case of a fixed installation. The ratings for this connecting suction line (4) must correspond with those of the suction equipment.

Fig. 5



The diaphragm pump may not be subjected to inlet pressure on the suction side (pressure in a supply system, e.g. in a ring line).

- Damaging essential components

When a threaded line is used in the suction assembly, the manufacturer's directions for installation of the threaded connection apply.



Stirring reduces the viscosity of thixotropic fluids; this improves e.g. the suction behavior of the diaphragm pump.

The agitator (5) must be fixed to the edge of the container so that the propeller is at the correct distance to the container wall, bottom and the suction tube.



- Eliminate friction.
- Never immerse an agitator that is running.
- Increase the rpm of the immersed agitator slowly.

The manufacturer's specifications apply to the agitator, its installation and operation.

(E) FLUID PRESSURE SYSTEM

The fluid pressure system usually consists of a hose and/or tube line. The hose line must have the following properties when used for surface coating:

- Electrically conductive, max. permissible resistance 3 x 10⁴/m (tested to ISO 8031).
- The inside line coating must be resistant to normal solvents, the outer coating resistant under certain conditions.
- Free from any substances that may interfere with paint spraying, like silicone.
- Operating temperature -40° to +90°C or higher.
- Complies with relevant standards (dimensioning, marking).
- The inner hose fittings are made from austenitic stainless steel, the outer fittings from galvanized and yellow chrome plated steel.
- Working pressure > max. allowed working pressure of diaphragm pump (≥ 25 bar).
- Connection thread usually G3/8.

In most cases the fluid pressure connection is joined to the diaphragm pump by a pipeline (1). The connection must be flexible (avoids fracture caused by vibration stresses).



The ratings for the flexible pressure line (2):

- Minimum rated width DN 9.5.
 - Working pressure > max. permissible working pressure of diaphragm pump.
- Operating temperature 10°C to 90 °C.
- For use in locations with explosion hazards Electrically conductive, maximum permissible resistance 3 x 10⁴/m (tested to ISO 8031).

The following applies to the surface coating:

Resistant to normal solvents and free from materials incompatible with paint such as silicone.



In an expanded fluid pressure system and in cases where the pressure system is influenced by heat (sunrays, heating, etc.) it is necessary to fit a suitable non-return valve (3) in the pressure pipeline (to prevent damage caused by thermal expansion).

If the fluid pressure is to be changed frequently and as reproducibly as possible, it is recommended to fit a mechanically or pneumatically operated pressure control valve (4).



It is an advantage to fit the pressure control valve directly to the diaphragm pump.

- Can be adjusted horizontally or vertically.

The manufacturer's specifications apply to the pressure control valve, its installation and operation.

Fig. 8

(F) APPLIANCE SUPPORT



Fig. 9

The support devices for 003.075-DP diaphragm pump are mountings. See technical product description B.6.50.75-P, page 7.

However, most diaphragm pumps are secured to the wall of a building or to a machine frame without any aids.

The bore holes and the screw length must be in accordance with the manufacturer's instructions when plugs are used to secure the pump to a wall.

<u>LIS</u>	T OF TOOLS				
		JC		Ĩ	Ĩ
	Allen	Open-ended	Handle		
	Screwdriver	Spanner	Article No.	Pliers	Pliers
	DIN 911	DIN 895	76395 007001	DIN 5254 A	DIN 5256 C
6		SW122 SW100 SW222	For rod	For socket	For retaining ring
3	000 3, 300 4, 300 0	300 12, 300 19, 300 22	M12x1	Nominal size 19	Ø 12 − 25

Open-end spanner DIN 895

- SW 19 Air pressure hose line
- SW 30/36 Connector to suction assembly
- SW 22 Hose line DN8, G 3/8 (fluid pressure system)

Use suitable tools in hazardous locations (see EN 1127-1, appendix A).

INSTALLATION

INSTALLATION AND MOUNTING

Do not mount in closed rooms (cabinets)

(malfunction due to icing of control system).

Diaphragm pumps must not be installed in zone 0 (containers).

All used assembling aids must comply to EN 1127-1, appendix A when installed in hazardous locations.

The following criteria must be met for a safe fixing:

- Bearing surface and/or wall even and load bearing.
- Plugs and mounting hardware must have correct dimensions.

VENTILATION OF WORK AREA



The ventilation of the work area must be guaranteed.

Fig. 10

GROUNDING

The appliances must be grounded properly when used in explosion-hazardous locations.

The grounding must be mechanically so resistant and corrosion-proof as to withstand all conditions to which it may be subjected in operation. The earth conductors should be connected to all appliance components and to the earth by soldering, welding or protected screw fittings. Chains may not be used. When making connections, in particular to pipelines, it should be ensured that the earth conductor is not interrupted by non-conductive parts or during repair work.

A qualified engineer must test the grounding connection for correct working conditions.

• The grounding point on the appliance is appropriately marked.

Portable, conductive vessels or appliances that can be electrically charged, must also be grounded. This is usually achieved by means of a flexible connection secured, for example, by a clip.

• Chains may not be used.

COMPRESSED AIR SUPPLY

The compressor and compressed air container (pressure tank) must have adequate dimensions.

- Check
- See also page 6, "Quality of Compressed Air"

CONNECTIONS

Compressed air line \leftrightarrow diaphragm pump,

Suction line \leftrightarrow diaphragm pump,

Pressure line ↔ diaphragm pump

flexible and, in locations with an explosion hazard, electrically conductive.

- See pages 5, 6, 7 and 9

Fia. 11

COMPRESSED AIR LINE

When a compressed air line needs to be installed, it must have a gradient of <u>3 to 5 mm per meter</u> down to the compressed air tank or the water trap.



When a branch line has to be installed from an existing compressed air line, it should connect above the line axis. When installing curved metal lines, they should be selected with a bend radius on the tube axis not smaller than 2.5 x the outside diameter of the line.

Plastic lines in locations with explosion hazards must have a conducting resistance to earth < 10⁶ •Ω.

COMPRESSED AIR CONTROL VALVE (PRESSURE REGULATION VALVE),

GAUGE AND BALL VALVE



- See page 5

When the pressure-regulating valve (1) has been factory-fitted to the diaphragm pump, it can be adjusted for easy reading of the pressure gauge.

- Loosen union nut
- Adjust pressure regulation valve
- Tighten union nut

FLUID SUCTION SYSTEM



Screw the connection piece (3) fully down into the diaphragm pump.

Next, back it out 1 to 1.5 turns, to allow the device to swivel.

When attaching the suction assembly to the connection:

Insert the tube end of the suction kit into the connector and press it against the stop in the internal taper.



If the end of the tube does not touch the stop, the installation is incorrect.

Tighten until clear resistance is felt.

- Use the connector as a hold.

Assembly check



Loosen swivel and check whether there is no clearance between the sealing ring and the retaining ring.

Reassemble after loosening; apply the same torque as the first time.

Use the connector as a hold.

When the suction assembly has already been fitted to the

Fig. 15 connector, this unit must be installed first, e.g. to a wall, before the diaphragm pump is installed.

FLUID PRESSURE SYSTEM

- See pages 8 and 9



Generally, the pressure line is connected to the diaphragm pump via an elbow ① (360° swivel) or a connector ② (fixed). - Elbow and connector G 3/8-A

GENERAL ASSEMBLY INSTRUCTIONS

- Always use recommended torque.
- Grease thread lightly.
- Do not use PTFE tape or hemp.
- Follow manufacturer's assembly instructions when using cutting rings or double conical rings.
 - See the following technical product description B.6.50.75-P, page 8 for the use of non-original accessories.



The parts in contact with the fluid in the suction and pressure system should not have a zinc-plated surface <u>nor</u> be made of aluminum if liquids are to be pumped that contain chlorinated hydrocarbons, e.g. trichloro-ethane or methylene chloride.

- There can be metal organic reactions that are explosive and extremely caustic.

START UP

FLUSHING THE DIAPHRAGM PUMP

Since all diaphragm pump are factory-tested with an anti-corrosion liquid after assembly, it is necessary to flush out the remainder of the liquid thoroughly with solvent (flushing agent), as well as any other contaminants that might have entered during installation.



The solvent must be compatible with the fluid to be processed later; we recommend consulting the fluid supplier.

After flushing, the solvent must be removed thoroughly from the equipment.

Air-drying does this.

- Air inlet pressure < 0,7 bar

START-UP DIAPHRAGM PUMP

Because the diaphragm pump works automatically with back pressure, it can only be commissioned (i.e. fluid delivered) when fluid is discharged from the pressure system, e.g. by using the spraying equipment.

Release the compressed air supply to the pressure regulation valve.

- Open pressure regulation valve.

- Ball valve handle parallel to compressed air line

Open the fluid supply.

- Open pressure line (discharge location).

BLEEDING THE PUMP/EQUIPMENT

Any air remaining in the diaphragm pump or the system must be removed completely. Check whether the suction system (suction tube) is immersed in the fluid.

- Open compressed air valve slowly until the diaphragm pump starts (air pressure approx. 0.7 bar).

 Maintain fluid pressure on diaphragm pump < 2.5 bar, until no more air is needed.

PREPARING FOR SPRAYING

Slowly increase the fluid pressure to the maximum level.

Run the diaphragm pump briefly at this level. While doing this, point the spraying equipment into the fluid container – hold at an acute angle to the container wall.

Then set the required operating pressure.

- Diaphragm pump/plant is ready for operation.

LOW AMBIENT TEMPERATURE

When operating the equipment in ambient temperatures of around 10 °C, anti-freeze should be added to the compressed air from a dosing apparatus (compressed air oilier). (We recommend ethylene glycol, diluted, with high-pressure additives).

IMPORTANT INFORMATION CONCERNING START-UP AND OPERATION

Do not run t a very short

Do not run the diaphragm pump without load, unless under supervision and then only for a very short period of time and at a low air input pressure.

Dry operation after the fluid has passed through must be strictly avoided. It will damage or destroy important component parts.



Continuous operation at excessive stroke frequency can accelerate icing of the control system (see technical product description B. 6.50.75-P, page 4) (increased pulsation until diaphragm pump shutdown) and it will reduce service life of the equipment as a result of increased wear.



Do not remove and replace the suction pipe or hose during operation.

- Air will enter into the system, causing irregularities in the coating.

Do not unscrew any parts of the diaphragm pump during operation.

Never immerse a running agitator propeller into a filled fluid container.

- Increase the speed of the immersed agitator propeller only gradually.



Wear personal safety equipment (breathing apparatus, goggles, gloves, etc.), when working with fluids that have a health hazard.



Because of the risk of fluid injection into skin, never place the spraying equipment directly on any part of the body (thumb, flat of the hand, etc.)



Never direct spraying equipment at humans or animals.

OPERATION

The diaphragm pumps run automatically, i.e. during operational shutdown (no fluid drawn out of pressure system) pumping will stop.

The tiniest leak usually caused by lack of tightness (ball valve, pressure retaining valve, spray valve, line connections, etc.) lead to extremely low stroke frequencies and are not acceptable (see technical product description B.6.50.75-P, page 4).

Therefore any leakage point in the fluid pressure system must be detected by making regular checks (by noticing a very slow drop in pressure at the fluid pressure manometer) and then removed.

It is therefore recommended that the pump is disconnected from the air supply overnight or over the weekend, and that the fluid pressure be lowered by bleeding (after air is disconnected), e.g. by spray gun operation.

Before a long-term shutdown, e.g. before the holidays, paint pumps must be flushed. To prevent paint residue in the pump from hardening, flushing agent should be left in the pump during the shutdown period.

We recommend using a phenol alkyl sulfon acidic ester as the flushing agent.



Consult the fluid supplier concerning the compatibility of the detergent.



Do not use nitro thinners or solvents as flushing agents.

MAINTENANCE AND INSPECTION, REPAIR

MAINTENANCE AND INSPECTION

Diaphragm pumps/systems 003.075-dp require little maintenance



- To avoid increased wear and tear of control components through contaminated air, a strainer (A) is fitted to the air pressure connection of the diaphragm pump. If the stroke frequency decreases over time this should be cleaned.
 - Simply screw out the filter strainer from the compressed air connector to clean it.

The flexing motion of the pump diaphragms leads to fatigue and they are also subject to natural wear.

To avoid diaphragm rupture we recommend regular safety inspections and diaphragm replacement.

- Always replace both diaphragms.

• Condensation water should be discharged daily from the pressure tank, filter or filter regulator when there is no automatic water drainage system in the compressed air supply.



When using anti-freeze (when operating at around 10 °C), replenish it after use. - The anti-freeze must be compatible for the materials in the pump, e.g. NBR.

- Check the performance of the safety valve in the diaphragm pump once a year. Exceed the maximum permissible working pressure slightly (opening pressure up to 1.1 times the permissible working pressure).
- The service life of the hose lines is adversely affected, and thus shortened, by surrounding influences (oxygen in air, temperature, light, etc.), even if correctly used. It is recommended that they undergo regular visual checks and occasional checking of performance. As a precaution, hose lines should be replaced by new ones at intervals set by the operator (after 2 to 3 years).



Do not carry out any dismantling work on a pressurized diaphragm pump.

Monitor diaphragm pumps regularly while in operation!

Abnormal symptoms such as

- major pressure fluctuations
- changes in running sound
- irregular running

are usually signs of advanced wear of the diaphragms or control parts. Timely replacement of the diaphragms will prevent further damage.

• always replace <u>both</u> diaphragms

(See troubleshooting, page 24)

REPAIR



All repairs must be performed by qualified engineers.

Use only genuine replacement parts.

We expressly draw attention to the fact that other replacement parts are not tested and released by us.

The installation and /or the use of such products can under certain circumstances have a negative effect on the pump's properties and affect safety.

Any liability on our part for damage resulting from the use of non-genuine replacement parts is excluded.



Before disassembly, ensure that the compressed air supply to the diaphragm pump is shut off safely, and relieve the pressure of the diaphragm pump.

All parts that are to be re-used should be cleaned thoroughly after dismantling.



Do not damage sealing surfaces; do not throw parts around or hit them; do not use any cutting tools.



Renew all removed seals.

Apply suitable lubricant to all threads and connections before assembling (lightly grease); never use grease containing silicone or vaseline.

When traces of wear can be seen on running or sealing surfaces the components affected must be exchanged.

DIAPHRAGM REPLACEMENT

DISMANTLING

1.





Always remove the right diaphragm (casing side) first.

If the diaphragm is in the retracted position, it must be brought into the extended position (AS) by pressing on the left diaphragm.

In order to prevent the rod (S) turning with the diaphragm when the latter is loosened, the previously removed left cover must be screwed on tightly again.

The left diaphragm (cylinder side) can also only be removed in the extended position (AS).

In order to prevent the rod from turning at the same time, it must be held directly underneath the diaphragm with an openended key (MS) SW 12.

Do not use pliers for holding the rod.

ASSEMBLY

3.

4.



Fig. 21

Screw the right diaphragm (housing side) tightly by hand to the rod.

Do not use any pliers for securing and holding.

Pre-assemble the right housing cover.

- Lightly tighten the cheese head screws crosswise by hand.

Screw the handle (see page 10) to the free end of the rod. Then pull the rod evenly into the left end position.

- Repeat the process until the rod no longer moves back.
- A screwdriver can be used as a lever.

Only apply the screwdriver on the handle side. Do not use any tools with sharp edges

- Risk of damage to the diaphragm space

Tighten the cheese head screws of the right housing cover one by one with the specified tightening torque (see page 22). Repeat the process until all cheese head screws have the same tightening torque.





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5.

Screw the left diaphragm (cylinder side) tightly by hand to the rod.

Install the left housing cover.

- Tighten the cheese head screws crosswise one after the other with the specified torque (see page 22). Repeat the operation until all screws have the same tightening torque.

Replacement diaphragms should be stored in a dry, cool, dust-free, dark location and no longer than 8 months. - Aging.

REPLACING CONTROL DEVICES

- Remove casing plate and insulation mat (opposite to the air connection)
- Unscrew the cylinder screws (1)•
- Remove the plate (2) with flat gasket seal (3)•
- Use two screwdrivers to lift out the sliding • seat (4)
- Remove flat slide (5)•
- Dismantle the retaining ring (6) with pliers • DIN 5256C nominal size Ø12-25
- Screw cylinder screw (1) into the plug (7) and • pull it out, upwards
- Reach into the housing and press out the drive • rod (8) upwards

Assemble in reverse order.



Place the flat seal gasket (3) on the slider seat (4) so that the channels in the slider seat are completely covered, if necessary turn the seal gasket.



REPLACING THE VALVES

- Remove diaphragm cover
- Remove sealing rings ①

Pressure valve

- Pull valve seat 2 out of the housing
- Remove the ball (3)

Suction valve

- Pull ball guide (4) out of the housing
- Remove the ball (3)
- Remove valve seat (5) with O-ring (6)
 - When assembling, first insert the O-ring in the housing and then insert the valve seat

The pressure and suction valves are assembled in the reverse order

ROD REPLACEMENT

- Dismantling diaphragms (see page 19)
- Dismantling control system (see page 20)
- Dismantle/remove housing (cylinder) ①
- Spread the socket (2) with pliers DIN 5254A, nominal size 19 and at the same time pull out the rod (combined piston and rod halves) (3) in the direction of the (3) removed housing from the diaphragm 1 housing (4).
 - The driver (5) remains free back in the diaphragm housing.

Before assembly, the O-rings (6) must be replaced.

Assemble in reverse order.

The exhaust opening in the insulation mat and the slit in the cover plate must be aligned and positioned between the suction connection and air connection.



Fig. 26



B. 6.50.75-B

NO REPLACEMENT OF THE CONNECTION PARTS (FLUID - INLET AND OUTLET)

The bushing 7 -page 21 and the connector 8 -page 21 are glued into the diaphragm housing and corresponding sleeve. The parts cannot be replaced separately.

REPLACING THE SUCTION UNIT

After this, slide the new sealing ring Part No. 75188 097002 on the tube end (4), with the inner metal taper directed to the stop ring (see pages 12 and 13).

THREADED CONNECTIONS

Do not exceed the tightening torque below when tightening screws.

TIGHTENING TORQUES

Ref.	Screw	Tightening torque
1	M 8 – 8.8	12 Nm
2	M 4 – 8.8	3.1 Nm
3	M 8 – 8.8	15 Nm
3	M 8 – 8.8	15 Nm
	I	

B. 6.50.75-B

SHUT DOWN

FOR A SHORT PERIOD

- Shut off the compressed air supply
- Relieve pressure in the diaphragm pump by discharging fluid (e.g. by using the spray gun)

FOR A LONGER PERIOD, BEFORE THE COMPANY HOLIDAY PERIOD

- Flush the diaphragm pump well (if necessary flush before and after)
- Leave neutral flushing solvent in the diaphragm pump
- Shut off the compressed air supply
- Relieve the pressure of the diaphragm pump by discharging fluid, e.g. by engaging the gun

FOR A LONG PERIOD

- Flush the diaphragm pump thoroughly
- Pump the flushing solvent out of the diaphragm pump
- Briefly run the diaphragm pump <u>empty</u> at the lowest air pressure level
- Disengage the air supply connection to the diaphragm pump (unscrew)

TROUBLESHOOTING				
BREAKDOWN ANALYSIS				
Component group	Nature of defect	Defect symptoms	Possible cause	Remedy
Compressed air supply	Pump doesn't start and drop in fluid pressure	Heavy leakage	Defective fitting	Replace defective fitting
		Narrowing of cross section	Hose line pinched, dirty fittings	Check lines
Diaphragm pump	Irregular operation, stroke frequency drop, pump stalls	Flat slide defective, driver rod seals defective	Wear	Replace worn parts, check compressed air strainer
		Icing	Air too humid, stroke frequency too high, ambient temperature too low	Remove ice, change operating conditions
	Air escapes continually from air exit aperture	Flat slide or sliding seat defective	Foreign body has gained access	Renew defective part, check compressed air filter
	Stalls during operation	Diaphragm rupture	Load limit exceeded, service life exceeded	Replace both diaphragms, clean diaphragm pump
	Doesn't stop when fluid line is blocked	Suction or pressure valves defective	Wear, foreign substances have entered system	Replace defective parts, check strainer in suction unit
	Doesn't start	Fluid in diaphragm pump hardened	Insufficiently flushed before long-term shutdown	Clean diaphragm pump
Fluid suction unit	Pump dos not start, pressure fluctuations	Strainer clogged, max. suction height exceeded, hose or seal defective	Fluid contaminated, installation of diaphragm pump incorrect, i,improper	Clean strainer, check tech. Specifications, replace defective parts
Fluid pressure system	Pump does not start, stalls during operation	Hose line pinched, spray gun clogged	Improper handling, fluid contaminated	Check hose line, clean spray gun

F22.060.02, issued on 07.99

NOTES SELF-CHECK

When diaphragm pumps/systems 003.075-DP are operated unsupervised, dangerous situations may be avoided with the automatic self-check feature.

A stop device is particular suitable for this, as it interrupts (cuts off) the compressed air supply to the diaphragm pump when the set limit is exceeded (e.g. due to excessive stroke speed caused by rupture of the line).

GUIDELINES AND DIRECTIVES TO COMPLY WITH

The European and national directives as well as national regulations and specifications currently in force are binding for the installation, starting up and operation of the diaphragm pump 003.075-DP.

USER INFORMATION

The user information (operating instructions) contains all necessary information about the correct use of 003.075-DP diaphragm pumps/equipment.

The Technical Product Description and the Replacement Parts List are standard parts of every operating manual. For organizational reasons they are issued as separate documents.

GRACO

DIAPHRAGM PUMP 003.075-DP

Air-powered, double-action diaphragm pump for liquid materials, particularly for use in locations with explosion hazards.

DESCRIPTION OF DIAPHRAGM PUMP

The diaphragm pump consists of the diaphragm housing ① with a compressed air control system (slide control system) ②, the cylinder unit ③, the diaphragms ④ the housing covers ⑤, the suction ⑥ and pressure valves ⑦ as well as the suction ⑧ and pressure connections ⑨. The diaphragms divide the operational chambers into

The rods (10) and (11) connect the diaphragms with each other. The ring piston (12) of the cylinder unit is located between the rods.

During operation the air chambers of the diaphragms and of the cylinder unit are filled with air at an alternate basis by the flat slide (13), that is driven by the rod.

The fluid is sucked into one of the two fluid chambers through a suction valve. At the same time the fluid is pushed from the other fluid chamber into the pressure system (14). This process is repeated alternately as long as fluid is delivered/removed. When the pressure system is closed, the forces

balance each other and the diaphragm pump stalls. Once fluid is removed from the pressure system, the pump starts automatically. Even minor leakage will be replenished. A safety valve (15) incorporated in the diaphragm pump prevents the maximum permissible air inlet pressure being exceeded. The strainer (16) in the air inlet (17) ensures that any contamination from the compressed air system does not enter the pump's control system. The integrated sound absorption system (18) dispenses the need for separate sound absorption.

Subject to change

Prepared by	15.12.00	Hilse	
Checked	15.12.00	Brink	
F22.060.01, issued on 07.99			

USER INFORMATION	
- TECHN. PRODUCT DESCRIPTION	-

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Fig. 1

Issued 05.01 B. 6.50.75-P

79996 001015-01

SUITABILITY, FLUID (-viscosity), USE

TASK, BEHAVIOR	SUITABILITY	PROCESSING OF	SUITABILITY
Supply application		Oil, diesel fuel, heating oil,	
Conveyance	++	Emulsions	++
Careful conveyance	Δ	Paint, containing solvent	++
Dosing	Δ	Water laquers	++
Suction behavior		Dispersions	++
Automatic suction	++	Latex	++
Tendency to		Print colors	Δ ?
Adhere, stick	Δ	Hardening agent	++
Deposits	Δ	Solvent	+ Δ
Foam	<u> </u>	Alcohol	+ Δ
Coagulate	-	Water, waste water	++
Crystallizing	-	Soap, cleaning agent	++
		Clay sludge, lime sludge	Δ ?
MATERIAL		Glazing	+ Δ
Kinematic viscosity in mm ² /s		Natural and synthetic	
up to 500	++	water and solvent-based	
500 up to 750	+ Δ	resins	+
over 750	Δ up to ?	Wood preservatives	++
Solids content		Fiber material, cellulose	-
None	++	Sludge, masn, paste	-
Low to 1%	+	Adhesive	?
Medium. 1 to 10%	$+\Delta$	LISE	
Over 10%	Δ ?	Area with explosion bezorda	
Over 50%	-		
Gas content		1 2G	++
Very low	++	REMARK	
Low	+	Please consult us	
High	Δ	in the case of	
Dehevier		aggressive (caustic)	
Benavior		fluids.	?
Corrosivo	++		
Abrasive		++ very suitable + suita	able
Caustic		Λ suitable under - unsu	uitable
Toxic		certain conditions	
Flammable danger classes AL ALL		2 Application must be test	ed
Trianinabio, danger diasses Al, All,			<u>.</u>

¹⁾ Open system, grounded, constantly monitored, air supply shut off when not in operation.

²⁾ Explosions-protected operating agents for general industry, use in zone 1; areas in which explosive gasses, vapors, mist, air mixtures are present. Surface temperature of the pump max. 50° C (unheated fluid).

Materials containing chlorinated hydrocarbons (halogenated chlorinated hydrocarbons) e.g. trichloroethene or methylene chloride, react with aluminum or galvanised parts producing metal-organic compounds. These compounds are explosive and extremely caustic.

TECHNICAL DATA KEY TO DESIGNATION DIAPHRAGM PUMP 003 . 075 - D P Pressure rating Appendix (Additional specification) 003 = 3:1 Type of drive: pneumatic Fluid volume flow Type of drive: pneumatic in cm³/stroke Action: double-action oscillating

PRODUCT RANGE

Diaphragm pump Material ¹⁾		Article no. (basic version)	
003.075-DP	SST (1.4571)	79082 040002	

¹⁾ area in contact with liquid

For detailed information on various models, accessories and product Nos. see sales documentation. DATA

Eluid volume flow max	26 l/min	(froe discharge)		
Fluid volumes	150 cm [°] /double	(PT10.006)		
Compressed air	dry, not	(moisture compressed air with high stroke		
	lubricated	frequency and high pressure leads to		
		cing of the control system – increased pulsation until standstill)		
Compressed air temperature	15 to 45°C			
	$\mathbf{O} = \mathbf{E} + \mathbf{e} + \mathbf{e}^{2}$			
Minimum air inlet pressure	0,5 bar -	(provides suction with wet valves, with dry valves 0.7 bar)		
Air inlet pressure max. perm.	7 bar			
Ratio	3:1 ²⁾	(theoretical)		
Operating pressure max. permissible	20.8 bar 2)	(static, dynamic 18.5 bar)		
Fluid temperature	10 to 80°C			
Kinematic viscosity	see page 2			
Suction height with pump empty	see page 7			
Suction height with filled system	6.5 m	(water)		
Load change (stroke) diaphragm min.	4.5 Million	(continuous operation full load,		
		see page 04)		
o				
Never pre-pressure the pump.				
DH = Double stroke ²⁾ Diaphragms retracted				

Max. per	Max. permissible stroke frequency in DH/min				
Continuous operation		Intermittent operation			
- Full load	- Partial load	- Full load	- Partial Ioad		
65	85	100	120		

Min. permissible stroke frequency (uninterrupted delivery)

1 double stroke in 15 min¹⁾

¹⁾ Increased pulsation operating state is caused by leakage and should be avoided.

When using the diaphragm pump for painting applications, only use operating agents (compressed air) that are free of substances affecting the wetting properties of the paint (e.g. silicone).

* Static air inlet pressure

The stroke frequency as a function of flow rate v					
v = 0,4 m/s v = 0,7 m/s v = 7			v = 1	,5 m/s	
Stroke frequency in double strokes/min	Volume flow in I/min	Stroke frequency in double strokes/min	Volume flow in l/min	Stroke frequency in double strokes/min	Volume flow in I/min
16	2.4	28	4.3	60	9.1

SOUND EMISSION

As the working places cannot be anticipated the highest possible sound level is shown.

CONSTRUCTION MATERIALS

OF WETTED PARTS

Ref.	Description	Material
1	Diaphragm	TFM
2	Housing cover	1.4571
3	Ball	1.4125
4	Valve seat	1.4305
5	Profile sealing ring	PA
6	Ball	POM
7	Ball guide	POM
8	O-ring	FPM

Ref.	Description	Material
9	Coupling sleeve	1.4571
10	Sealing washer	POM
11	Seal	POM
12	Seal	POM
13	Sealing washer	POM
14	Sleeve	1.4571
15	Sleeve	1.4571
16	Connector	1.4571

DIMENSIONS, SCREW CONNECTION THREADS, RATED DIAMETER OF CONNECTIONS, MOUNTING POSITION

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Attachment position	Suction height (pump empty, wet valves)	Different attachment position, note	Suction height (pump empty, wet valves)
A	1.5 m	Rotated around axis X-X 90°, cylinder down (corresponds to attachment position D)	2.5 m
В	1.5 m	Rotated around axis X-X 90°, cylinder down (corresponds to attachment position D)	2.5 m
С	1.5 m	Rotated around axis Y-Y 90° (corresponds to attachment position B)	1.5 m
D	2.5 m	-	-
E	-	Attachment position not permissible	-
F	1.5 m	-	-
G	1.5 m	-	-

<u>NOTES</u>

ACCESSORIES

The original accessories – see user information B. 6.50.75-A – have been tested and verified by us. We expressly draw attention to the fact that other accessories have not been tested and released by us.

The attachment and/or use of such products can therefore under certain circumstances have a negative effect on the properties of the diaphragm pump and affect safety.

We accept no liability for any damage resulting from the use of non-original accessories.

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DIAPHRAGM PUMP NO. 003.075-DP

Replacement part set, diaphragm		agm Part No. 79978 908211		3211
Ref.	Number	Description		
80	2	Diaphragm	D 123	
270	4	Profile sealing ring	17.2 x 28.2 x 5.4	

Replacement	eplacement parts kit, seals - control Part No. 79978 908104		Part No. 79978 908104
Ref.	Number	Description	
90	1	Carriage complete	-
110	1	Plug complete	D 16
140	1	Flat slide	24 x 19
150	1	Valve seat	-
160	2	O-ring	42 x 2 B
170	1	O-ring	48 x 2 B
180	1	Flat seal washer	72 x 58 x 0,5
270	4	Profile sealing ring	17.2 x 28.2 x 5.4
275	1	Retaining ring	17 x 1

Replacement parts kit, valves Part No. 79978 089		Part No. 79978 089001	
Ref.	Number	Description	
250	4	Ball	18 mm
255	2	Profiled ring	20 x 27.9 x 4.6
260	2	Valve seat	D 12
270	4	Profile sealing ring	17.2 x 28.2 x 5.4
280	2	O-ring	22 x 3 B
290	2	Valve seat	D 12
300	4	Ball guide	Ball 18

Replacement parts kit, rod		Part No. 79978 908212	
Ref.	Number	Description	
20	3	O-ring	14 x 2 B
35	1	O-ring	115 x 2.5 B
60	1	Rod	D14 L143.5
70	1	O-ring	107 x 3 B
100	2	O-ring	10.82 x 1.78
120	1	O-ring	13 x 1.5 B
160	2	O-ring	42 x 2 B
170	1	O-ring	48 x 2 B
180	1	Flat seal washer	72 x 58 x 0.5
270	4	Profile sealing ring	17.2 x 28.2 x 5.4

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REPLACEMENT DIAPHRAGM PUMP REPLACEMENT ACCESSORIES

Diaphragm pump, standard model

Accessories

	Ref	Description	Material	Notes	Part No.
Air pressure inlet	1001	Pressure regulation	-	R 3/8	77631 012002
	1002	Ball valve coupling	-	PN 50 R 3/8-G3/8	77601 013002
	1003	Nipple	-	8 R 3/8 tap. – M22x1.5	76639 208001
	1004	Connector	SST	8 – G3/8	76640 005001
Grounding	1011	Ground wire	-	Length 8m	73483 001011
Suction connection	1021	Connector	SST	M26x1,5 x G3/4	77741 131002
	1022	Adapter union	SST	GE22 – ZLM-ED	75204 010004
	1023	Suction hose	SST	30I container with filter	78848 020006
	1024	Suction hose	SST	200I container with	78848 020007
	1025	Suction hose	SST	D22 L1000	77848 035009
	1026	Suction hose	SST	D22 L1600	77848 035010
Pressure connection	1031	Ball nipple	SST	G3/8 disconnectable 77254 0080	
	1032	Bracket	SST	8 – G3/8 flexible	77214 017003
Mounting the gun	1041	Hexagonal screw	-	M8 x 211	77002 011002
	1042	Bracket	-	-	76650 031001
	1043	Bracket	-	-	76650 032001
	1044	Cheese head screw	-	M8 x 16	74006 092033

b) Connection thread M22 x 1.5
c) - two

a)

- d) Can be 2
- e) Can be 4

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f) Replacement washer, Item ID. 75188 097002 for Pos. 1021 and 1022

Connection - thread G3/8

g) Replacement O-ring, Part No. 74186 026020 for Ref. 1021

m ID. 75188 097002	Order Example Please lay out each order as follows: Description	Re	ef.	Part No.
t No. 74186 026020	Diaphragm Pump No. 003.075-DP	00	2	79082 040002
				Page 1 of 1
USE	R INFORMATION		Issued	12.00
- REPLACEMENT EQUIPMENT/ACCESSORIES -			B.	6.50.75-A

Consult the complete GRACO catalogue for other accessories

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Note

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GRACO STANDARD WARRANTY

GRACO warrants all equipment manufactured by GRACO and bearing its name, to be free from defects in material and workmanship on the date of sale by an authorized GRACO distributor to an end user. With the exception of any special, extended, or limited warranty published by GRACO; GRACO will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by GRACO to be defective.

This warranty only applies when the equipment is installed, operated and maintained in accordance with GRACO 's written recommendations.

This warranty does NOT cover for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non- GRACO component parts. Nor shall Graco be liable for malfunction, damage or wear caused in such a way.

Nor shall GRACO be liable for malfunction, damage or wear caused by the incompatibility of GRACO equipment with structures, accessories, equipment or materials not supplied by GRACO, or improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by GRACO.

This warranty is conditioned upon the repaid return of equipment claimed to be defective to an authorized GRACO distributor for verification of claimed defect.

If the claimed defect is verified, GRACO will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid.

If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation. THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

GRACO's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above.

The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available.

Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO does not extend its warranty to accessories, appliances, materials or components which are sold by GRACO but are not manufactured by GRACO and makes no guarantee, however implied, with regard to the brand capability and suitability for a certain purpose.

These parts sold by GRACO but not manufactured by Graco (such as electric motors, pressure switches, hoses, etc.) are covered by the warranties of the respective manufacturers. GRACO will provide reasonable support to the buyer in enforcing any warranty claim.

IN NO EVENT CAN GRACO BE MADE LIABLE FOR INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES WHICH ARISE FROM THE SUPPLY OF APPLIANCES BY GRACO UNDER THE CONDITIONS GOVERNED BY THESE PROVISIONS, OR THE SUPPLY, PERFOR-MANCE OR USE OF ANY PRODUCTS OR OTHER GOODS WHICH ARE SOLD UNDER THE CONDITIONS GOVERNED BY THESE PROVISIONS, WHETHER AS THE RESULT OF BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE ON THE PART OF GRACO OR FOR ANY OTHER REASON.

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