

USER INFORMATION

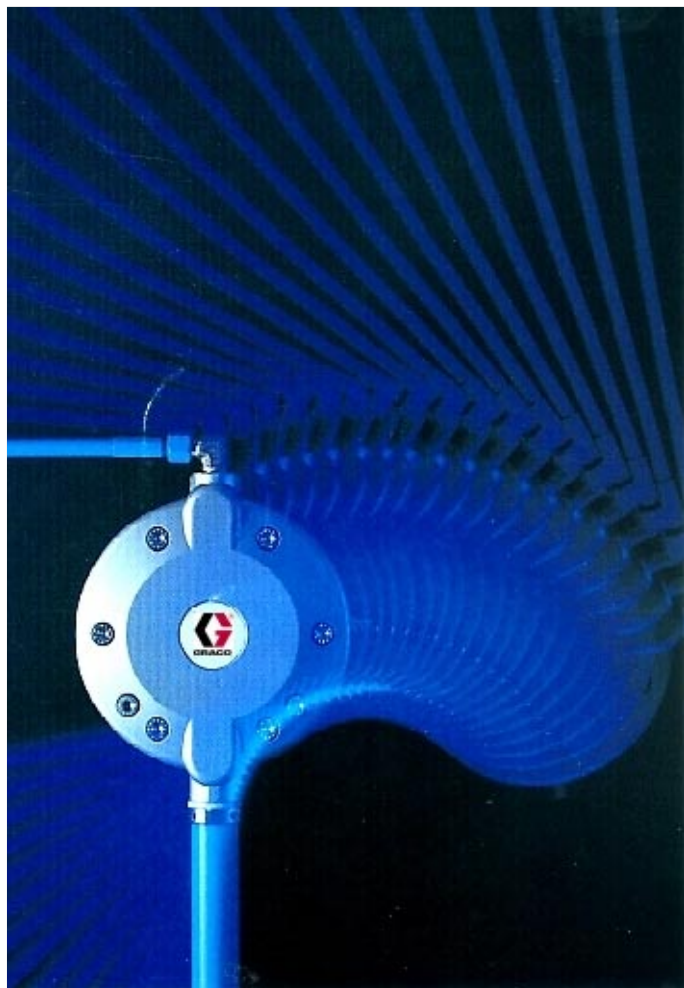
KEEP FOR FUTURE USE

6000302E

Rev. C

B. 6.50.35

001.085-DP



REGULUS® Diaphragm Pump

GRACO N.V.

Industrieterrein "Oude Bunders"

Loc. 2206 - Slakweidestraat 31

3630 Maasmechelen - Belgium

Tel.: 32 89 770 700 Fax: 32 89 770 777



REGULAR TESTING OF THE APPLIANCES

Test certificate No.	Test date	Person responsible	
		Company	Name

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

The operator must ensure that 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 competent person ¹⁾.

The operator must ensure that the test results are properly recorded in writing for every fluid spraying equipment ²⁾ and kept until the next test.

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

¹⁾ A competent person 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⁾ Written records (test results) can, for example, be in the form of test certificates.

³⁾ At the place of use, a copy of the test certificate or a test stamp on the appliance is considered as in compliance with the requirement.

DIAPHRAGM PUMP 001.085-DP

GRACO		
VERFAHRENSTECHNIK GMBH		
D-33647 BIELEFELD		
DRUCKLUFTGETRIEBENE KOLBENPUMPE		
GERÄTE-TYP	REGULUS 001.085-DP	
HERSTELL-NR		
BAUJAHR		
MATERIAL-		
VOLUMENSTROM	MAX	32 l/min
TEMPERATUR	MAX	80°C
ÜBERDRUCK	MAX	8 bar
LUFT-		
EINGANGSDRUCK	MAX	8 bar
ÜBERSETZUNGSVERHÄLTNIS		
°NACH DIN 24 374 TEIL 1		

Fig. 1

The original factory shield is located on the diaphragm pump.
Please compare all specifications and complete, if necessary.

Read and follow the operating and safety
instructions before commissioning!

All important sections in this manual are marked with the following
symbols:



Directions affecting your safety



Important operational directions

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

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Subject to change

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Prepared by 20.04.01 Hilse

Checked 25.04.01 Brink

USER INFORMATION - OPERATING INSTRUCTIONS -

Issued 04.01

B. 6.50.35-B

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CORRECT USE

The diaphragm pump 001.085 DP are exclusively manufactured for common applications in surfacing 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 any 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.

The 001.085-DP diaphragm pump may only be operated, maintained and serviced 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

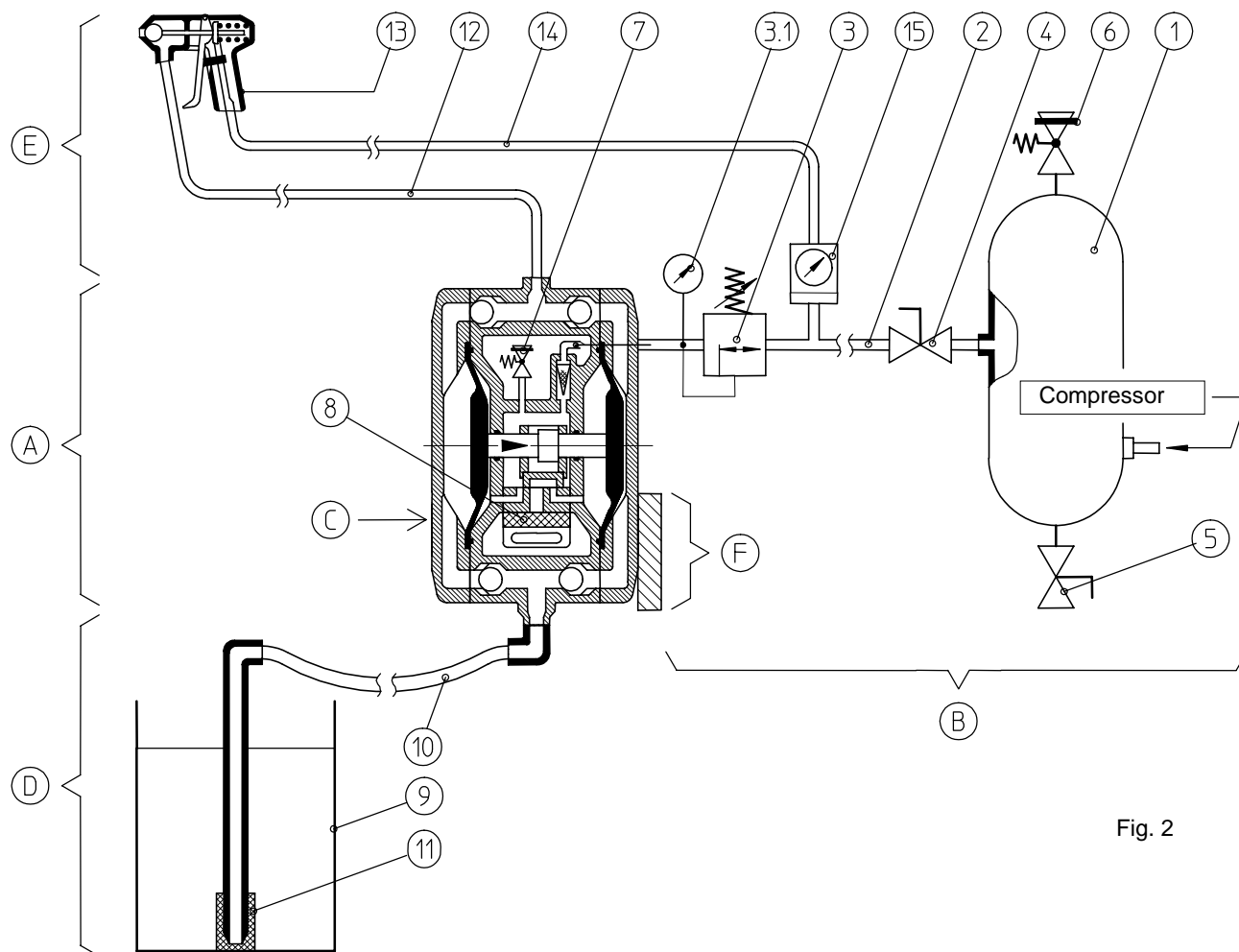


Fig. 2

- | | | |
|-----------------------------------|-------------------------------|----------------------------|
| (A) DIAPHRAGM PUMP | (1) Compressed air container | (8) Silencer |
| (B) COMPRESSED AIR SUPPLY | (2) Pipeline or hose | (9) Fluid container |
| (C) AIR EXHAUST SOUND SUPPRESSION | (3) Pressure regulation valve | (10) Suction pipe |
| (D) FLUID SUCTION SYSTEM | (4) Ball valve | (11) Strainer |
| (E) FLUID PRESSURE SYSTEM | (5) Ball valve | (12) Pressure line |
| (F) APPLIANCE SUPPORT | (6) Safety valve | (13) Spray gun |
| | (7) Safety valve | (14) Air pressure pipeline |
| | | (15) Filter regulator |

DESCRIPTION OF FUNCTIONS

The compressed air is supplied to the diaphragm pump (A) from a pressure tank (1) through a tube or hose line (2) and a pressure-regulating valve (3).

The air supply from the pressure tank to the diaphragm pump can be interrupted by the ball valve (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 valve (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 via the suction line (10) and supplied under pressure to the dispenser (e.g. a spray gun) (12) through the pressure line (hose/tube) (13).

A strainer (11) protects the diaphragm pump against foreign substances which unintentionally entered the fluid.

The atomizing air can be supplied to the spray gun via a branched compressed air line (14), in which a filter regulator (15) is incorporated.

EQUIPMENT COMPONENTS – IMPORTANT INFORMATION

The following components are required in an operational system:

(A) THE DIAPHRAGM PUMP

For a description of diaphragm pump functions, see "Technical Product Description B.6.50.35-P".

(B) THE COMPRESSED AIR SUPPLY

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

- When a compressed air supply needs to be installed, the relevant accident prevention regulations, safety rules and user information must be respected, according to 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 suitable.

- Rated diameter DN 8 or more
- Working pressure = max. mains pressure, preferably ≥ 16 bar)
- Air and ambient temperatures -20° to $+50^{\circ}$ °C
- Free from any substances that may interfere with paint spraying, like silicon

In areas with a danger of explosion, compressed air lines and hose lines must be electrically conductive (to avoid electrostatic charging).

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

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

- Efficient flow rate at 6 bar and 25m/s $> 30 \text{ m}^3/\text{h}$
- Air inlet pressure 10 bar
- Air and ambient temperatures 0° C to 50° C

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

The manometer (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 $+50^{\circ}$ °C
- Damped construction

A shut-off mechanism (e.g. a ball valve) should always be fitted between the pressure-regulating 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 regulator.



Never open and shut the shut off 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 seal connections (malfunctioning of pressure regulation valve - as a result of PTFE or hemp residues in compressed air supply).

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

- Condensate and residue oil from the compressor are separated mechanically (pressure tank, compressed air filter)
- Lubrication of compressed air not necessary
- Temperature of compressed air 10° C to 40° C

The compressed air must be free from any substances that may interfere with paint spraying, like silicon or oil.

- This also applies to all components of compressed air supply

When the compressed air is used for atomizing the fluid, a filter regulator, branched off from the main compressed air supply (15 in the functional diagram) must be installed upstream.

- Efficient flow rate at 6 bar and 25m/s > 32 m³/h
- Air inlet pressure 16 bar
- Air and ambient temperatures 0° C to 50° C

© AIR EXHAUST SOUND ABSORBER

Without a sound absorber the sound emissions of an air-powered diaphragm pump are damaging to the hearing [> 100 dB(A)].

Every diaphragm pump is therefore fitted with an integrated sound absorber.

As there is a direct relation 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 (70 dB(A))].

For detailed information on the sound pressure level in the corresponding section in the "Technical Product Description B.6.50.35-P", page 04.



Do not use the diaphragm pump without its sound absorbing components.

- The decision to wear hearing protection depends on the operating pressure and the resulting sound level.

④ FLUID SUCTION KIT

The suction connector of the diaphragm pump allows the installation of a pivoting connector ① (in Al model type only in combination with a coupling sleeve); it is also possible to attach a suction tube ② or suction container ③.

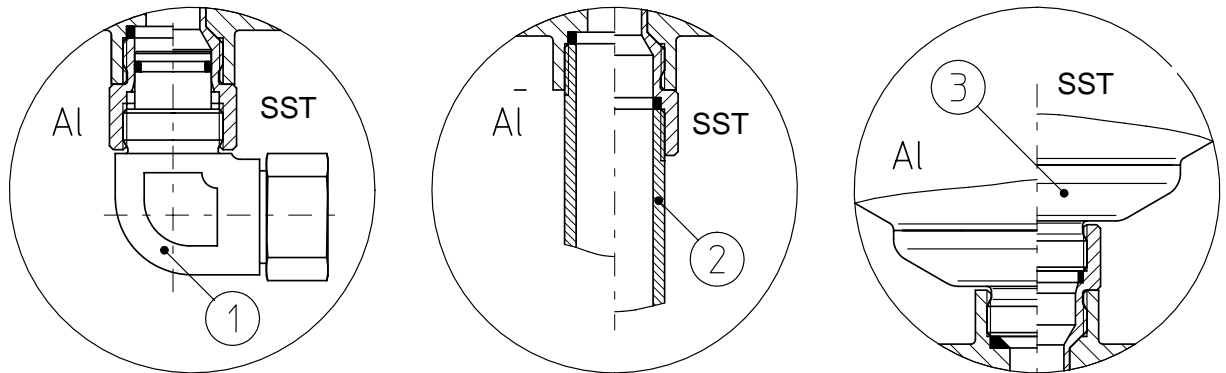


Fig. 3

Use the connector to install a suction assembly or a suction tube.

Suction tubes have threaded ends.

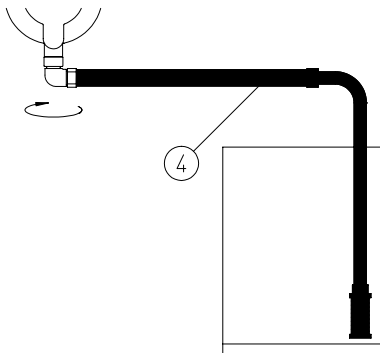


Fig. 4

Most diaphragm pumps are equipped with a connector and a suction assembly ④ (suction hose, tube and suction sieve).

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.

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, that can be identified by an increasing pressure drop during the change of direction (pulsating pressure).

- This can be improved with one of the following measures:
Suction line/suction hose with a larger diameter, shorter suction hose.

Specifications of suction assembly:

- Electrically conductive, maximum permissible resistance $3 \times 10^4 \Omega/\text{m}$ (tested to ISO 8031) or derivation resistance to earth $< 10^6 \Omega$.
(suitable for use in locations with an explosion hazard.)
- The individual parts of the suction assembly 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

For the SST model type, all wetted metal parts of the container of the suction unit are made from austenitic stainless steel (suitable for water-based paints).

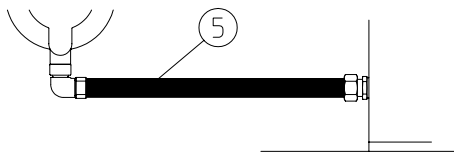


Fig. 5

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 ⑤ must correspond with those of the suction equipment.



Pressure must not be applied to the diaphragm pump on the suction side (pressure in a supply system, e.g. in a ring circuit).

- Damaging essential components

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

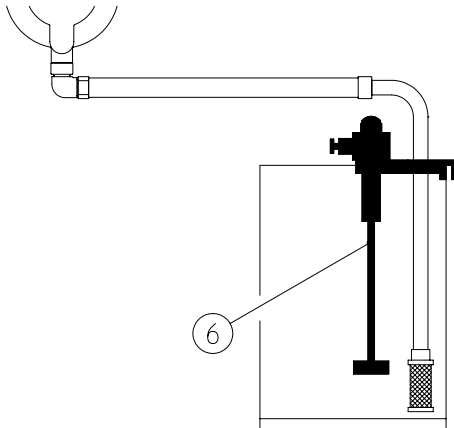


Fig. 6

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

The agitator ⑥ 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.

All immersed parts of the agitator (spindle and propeller) are made from austenitic stainless steel (suitable for water-based paints).

The agitator is pneumatically driven, maximum permissible air inlet pressure: 6 bar.

Speed can be set on the built-in flow control valve. The ideal agitator speed for a particular fluid must be determined by the user.

- The propeller of the agitator is enclosed within an external protection ring.
- Techn. Product Description B.18.10.05-P.

If an agitator of another manufacturer is used, the specifications of this manufacturer apply to installation and operation.

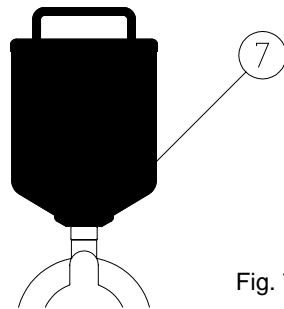


Fig. 7

Diaphragm pumps with a fixed container (7) are particularly useful for smaller quantities of coating agent (e.g. for repair paint jobs).

- All wetted parts of the container are made from stainless steel (suitable for water-based paints).
- Container capacity 5 l.
- Design certification for highly flammable liquids of classes AI and AII is not required, since the container is made entirely from metal.
- The container is suitable for use in areas with explosion hazard, because electrostatic charging cannot occur.

Since the diaphragm pump can be attached anywhere (see Techn. product description B.6.50.35-P, page 06), the suction connection for the container can be pointed upwards.

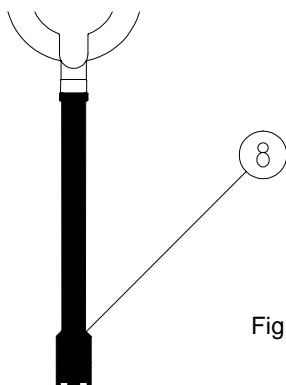


Fig. 8

The suction tube with foot valve (8) is used on diaphragm pumps installed on a stand or on a lifting apparatus.

The back pressure valve installed in the lower end of the suction tube prevents the diaphragm pump from being emptied during a change of the fluid container.

- No additional ventilation necessary.

- Austenitic stainless steel is used for the SST model.
- The built-in strainer has a mesh size of $w = 1$.

⑤ FLUID PRESSURE SYSTEM

The fluid pressure system usually consists of a a hose line and a dispensing unit (spray gun).

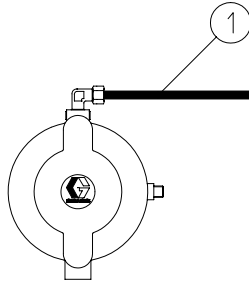


Fig. 9

The hose line ① connects the diaphragm pump with the dispensing unit. In many cases, however, the hose line is screwed to the pressure-regulating valve (Fig. 12).

The connection hose line ↔ diaphragm pump and the connector to the pressure-regulating valve have no seals (sealed screw fittings).

For surface coating applications, the hose line (fluid) must have the following specifications:

- Minimum rated width DN 9.5
- Electrically conductive, max. permissible resistance $3 \times 10^4 \Omega/m$ (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 $+90^\circ\text{C}$ 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 (approx. 15 bar).
- Connection thread usually G3/8.

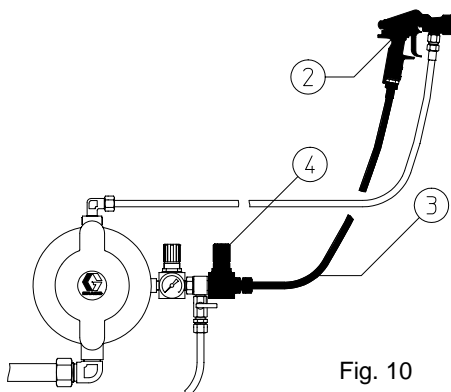


Fig. 10

The nozzle or spray gun ② is installed at the end of the hose line.

The fluid is atomized by means of air. The atomizing is drawn from the compressed air hose line ③ and a second pressure regulating valve (or filter regulator) ④ from the diaphragm pump's compressed air supply.

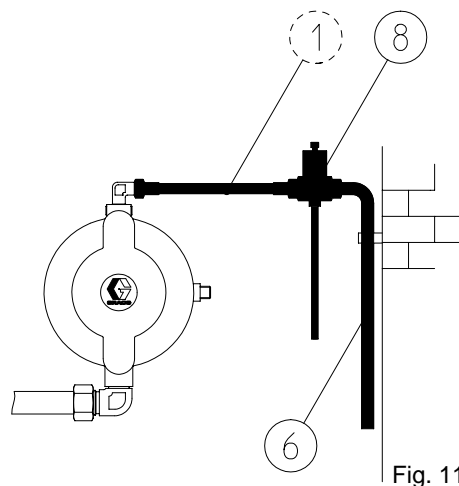
The manufacturer's specifications apply to the nozzle or spray gun.

The user information will also have been provided if we supplied the nozzle/spray gun.

Requirements for the compressed air hose lines (atomizing air):

- Electrically conductive, max. permissible resistance $3 \times 10^4 \Omega/\text{m}$ (tested to ISO 8031).
- Under certain conditions solvent compatible.
- Free from any substances that may interfere with paint spraying, like silicone.
- Max. working pressure 10 bar.
- Connection thread normally M 14x1.

In special cases the fluid pressure connection at the diaphragm pump is connected by a pipeline ⑥. The connection must be flexible (to avoid rupture caused by vibration).



For the rated data for the flexible connection: see hose line ①, page 10.



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 ⑧ in the pressure pipeline (to prevent damage caused by thermal expansion).

Fig. 11

If the fluid pressure has to be changed frequently and as reproducibly as possible, it is worth fitting a mechanically or pneumatically operated pressure regulating valve ⑨. It is recommended to fit the pressure regulating valve directly to the diaphragm pump.

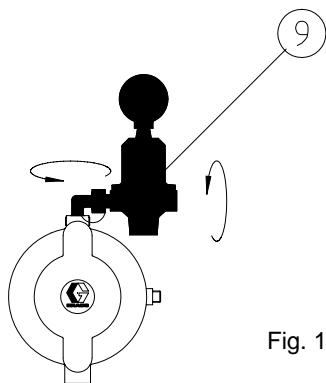


Fig. 12

- Can be adjusted horizontally or vertically.

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

The user information is provided if the pressure regulator has been provided by us (catalog 09.2001).

F APPLIANCE SUPPORT

The support devices for diaphragm pump 001.085-DP are:

Stand, fluid container cover, pump cart, lifting trolley (mechanical), lifting trolley (pneumatic), lifting devices (pneumatic).

Most diaphragm pumps are secured to the wall of a building or to a machine frame without any special aids.

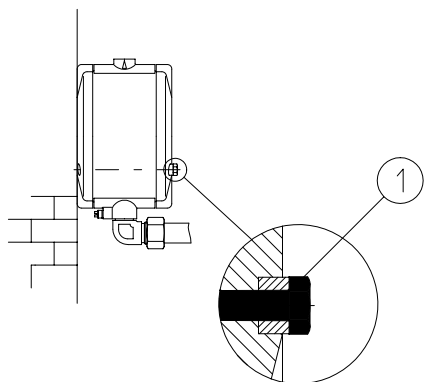


Fig. 13

The bore holes and the screw length must be in accordance with the manufacturer's instructions if plugs are used to secure the pump to a wall. If plugs and corresponding screws are supplied by us, they comply with the Technical Product Description B.17.90.01-P.

Spacers are required when hex head screws ① are used to fasten the diaphragm pump (supplied with the wall fixing kit).



Tighten the diaphragm fastening screws only fingertight without any particular effort (tightening torque approx. 8 Nm).

Do not extend the tool (tube, rod) in any way.

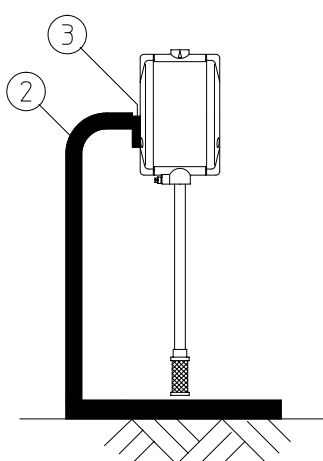


Fig. 14

Use the stand ② to mount the diaphragm pump on even floor surfaces.

The diaphragm pump with suction tube and stand assembly allows a rapid change of the fluid container. It can be lifted, or shifted to a different location when changing the container.

It should be noted here that the area should be stable and as flat and level as possible (inclination < 10°) ist.

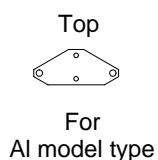
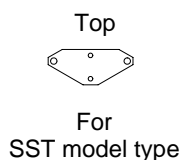


Fig. 15

The bracket ③ can be positioned in different ways as a compensation for the length of the suction tube, depending on pump design.

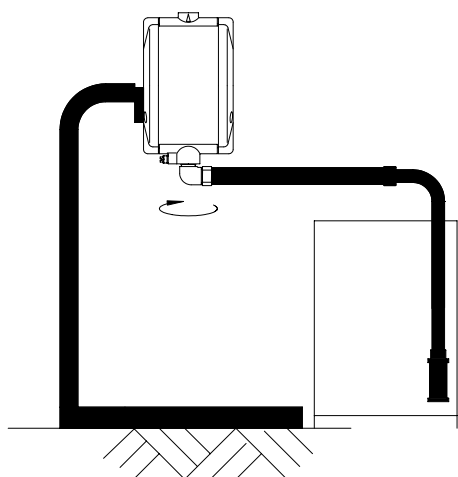
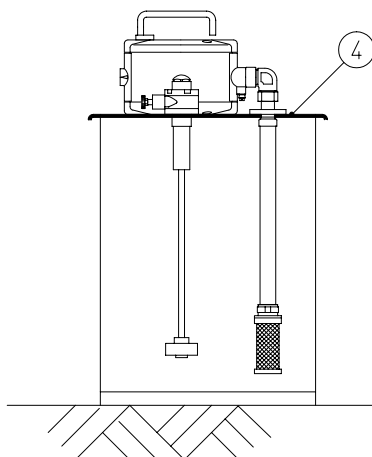


Fig. 16



Do not leave complete "diaphragm pump with suction tube and stand" assemblies standing free; they must be secured to the floor.

The supplied plugs and screws comply with the Technical Product Description B.17.90.01-P.



The container cover ④ is placed on the container rim without fasteners. The diaphragm pump is mounted horizontally on the container cover. The suction hose is immersed in the fluid through the container cover. To change the container, simply lift up the assembly using the handle.

Fig. 17

If an agitator is used in the equipment, the directive on flammable liquids (VbF) prohibits the use of highly flammable class AI and All fluids.

This directive does not apply if at the place of work (i.e. in the container) AI or All class liquid is only kept in such quantity as is sufficient to continue work.

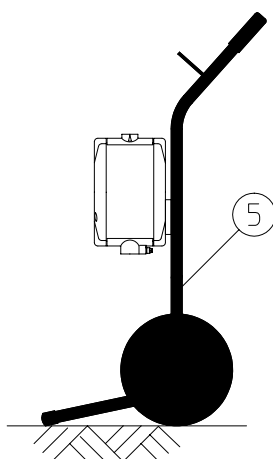


Fig. 18

The pump carts ⑤ have a two-wheel undercarriage. Their function is the same as that of a sack trolley.

- While in idle position, the load holder is located in front of the wheels, in running position directly behind.

Since the trolley wheels cannot be locked, the floor surface must incline as little as possible (inclination < 10°).

Fully equipped pump carts are not constructed to be put down vigorously with a lifting tool.

The wheels are not electrically conductive. This means that in hazardous locations, zone 1, the pump carts can only be used when specific measures are taken. The carts can be used safely in zone 2, however.

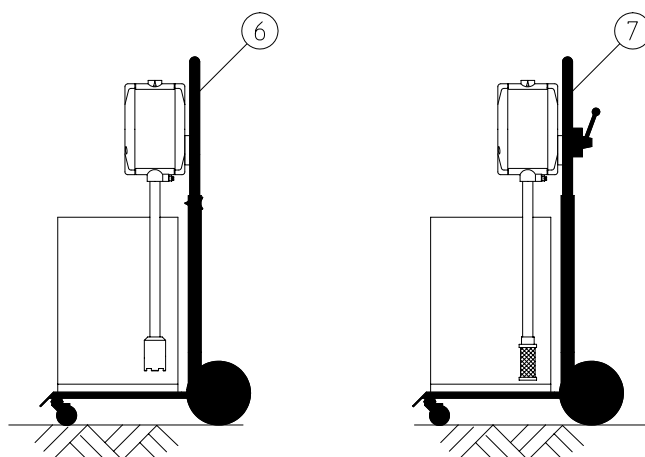


Fig. 19

The lifting trolleys ⑥ and ⑦ have four wheels. The undercarriage is designed as a supporting base for one container (30 l max.).

The floor surface on which the pump trolleys are moved must incline as little as possible (inclination < 10°).

Fully equipped lifting trolleys are not constructed to be put down vigorously with a lifting tool.
The wheels are not electrically conductive.
Regarding the way they are used, the same applies as for the pump trolleys.

With the mechanical lifting trolley ⑥, lifting, maintaining the load in an elevated position and lowering to starting position is done manually.

- The screw with the star-shaped handle mounted on the side is used for clamping.



Fast lowering (dropping) can be prevented by manual force.

Travel of lift 400
Load carrying capacity approx. 40 kg

As for the pneumatic lifting trolley ⑦, lifting, maintaining the load in an elevated position and lowering to starting position are effected by means of a pneumatic hand lever valve.

- Hand lever up = lift and hold
- Hand lever down = lowering into starting position

A built-in compressed air throttle valve prevents rapid lifting and lowering motion.

Travel of lift 400
Load carrying capacity approx. 40 kg
Working air pressure max. 7 bar
Pressure line DN 6

The label on the right is affixed to the pump carts and trolleys,
and refers to the guidelines to be respected.

Follow VBG 23,
ZH 1/200

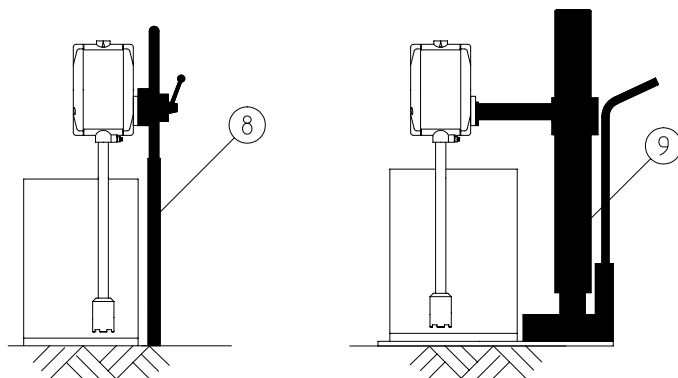


Fig. 20

Like the stands and the lifting trolleys, pneumatic lifting devices are used for rapid container change.

The lifting apparatus ⑧ corresponds to the pneumatic lifting trolley with regard to functions
- (lifting apparatus identical in construction).

The lifting apparatus ⑨ is a one-pillar design (vertical lifting cylinder). The advantage of this design is its horizontal swiveling capability.

- The diaphragm pump can be swiveled from the empty container to the full container.

Lifting, maintaining the load in an elevated position and lowering to starting position is effected by means of a hand lever valve mounted on the side.

A built-in air flow adjustment valve prevents rapid lifting and lowering motion.

- Travel of lift 430 mm
- Boom load max. permissible 21 kg (load application point 300 mm from the cylinder axis)
- Air pressure 0.3 bar to 1.5 bar
- Pressure line DN 6
- Mounting of diaphragm pump, also with "container cover with agitator".



The elevator must be secured to the floor. The supplied screws and plugs comply with the Technical Product Description B.17.90.01-P.

If a diaphragm pump with container cover and agitator is affixed to the lift, the directive on flammable liquids prohibits the use of this assembly for highly flammable liquids class A I and A II (agitator design not approved).

The directive does not apply if at the place of work (in the container) A I or A II-liquid is only kept in such quantity as is sufficient to continue work.

- The agitator corresponds to that on page 8.

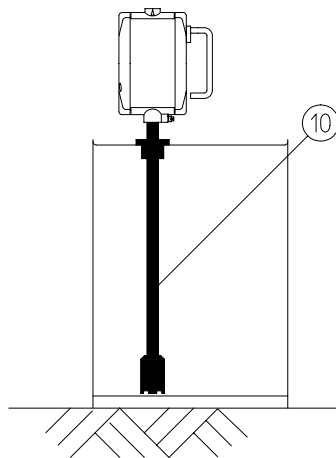


Fig. 21

In the bung drum model the suction tube with foot valve, is immersed in the fluid through the opening in the bung drum cover ⑩ (see page 9).

The bung sleeve closes the opening and prevents the diaphragm pump from tipping over.

Do not place the diaphragm pump in a bung drum without a cover.

- Danger of tipping over when the 30l container is nearly empty.

LIST OF TOOLS





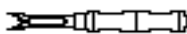
				
Hexagon socket offset screw key DIN 911	Open-end spanner DIN 895	Flat pliers DIN 5248	Pliers DIN 5256 C	Grip Part No. 70630 002002
SW 3, SW 6	SW 19	Length 140	For retaining ring Ø 12 – 25	Special tool

Fig. 22

Open-end spanner DIN 895

SW 17 Compressed air hose line (compressed air supply)

SW 30/36 Connector to suction assembly

SW 22 Hose line DN8, G 3/8 (fluid pressure system)



Use suitable tools in areas with explosion hazard
(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 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.

GROUNDING



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

The earthing 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 by e.g. 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 ↔ diaphragm pump,

Suction line ↔ diaphragm pump,

Pressure line ↔ diaphragm pump

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

- See pages 5, 8, 10 and 11

COMPRESSED AIR LINE

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

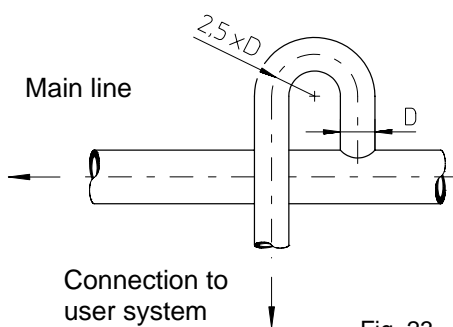


Fig. 23

When a branch line has to be installed from an existing compressed air line, it should connect above the line axis.

In the case of bends in metal air pipes these should be selected with a bend radius of the pipe axis not smaller than 2.5 x the pipe outside diameter.

- Plastic lines in locations with explosion hazards must have a conducting resistance to earth $< 10^6 \Omega$.

COMPRESSED AIR CONTROL VALVE (PRESSURE REGULATION VALVE), MANOMETER AND BALL VALVE

- See page 5

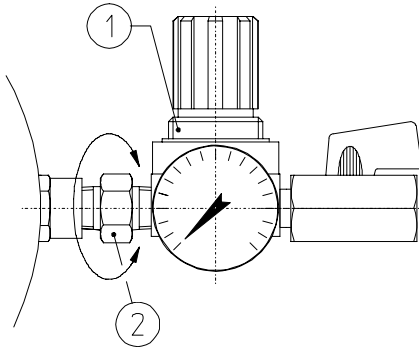


Fig. 24

If 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 ②
- Adjust pressure regulation valve
- Lighten union nut

FLUID SUCTION SYSTEM

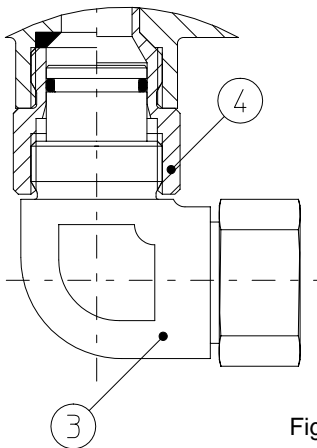


Fig. 25

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

(The connector ④ must have been installed for diaphragm pumps in the AI model).

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 assembly 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

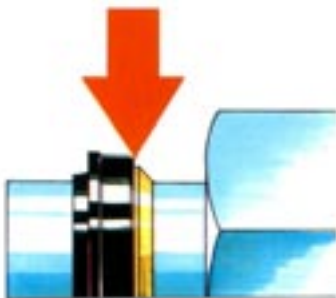


Fig. 26

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

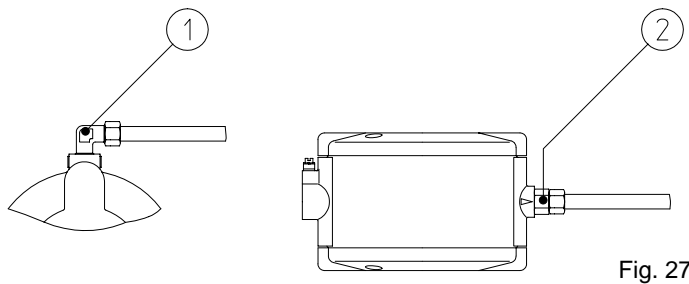
Reassemble after loosening; apply the same torque as the first time.

Use the connector as a hold.

When the suction assembly has already been fitted to the connector, this unit must be installed first, e.g. to the wall, before the diaphragm pump is installed.

FLUID PRESSURE SYSTEM

- See pages 10 and 11



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.6.50.35-P, page 08 for the use of non-original accessories.



Only use the stainless steel (SST) model when liquids that contain chlorinated hydrocarbons (halogenated hydrocarbons), e.g. trichloro-ethane or dichloromethane, are to be pumped.

- See Technical Product Description B.6.50.35-P, page 02 and 03.

The wetted parts in the suction and pressure system may not have a galvanized surface nor contain aluminum parts.

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

START UP

FLUSHING THE DIAPHRAGM PUMP

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.



Any detergent used must be compatible with materials to be used later; we recommend consulting your material supplier.

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

This is done by air-drying.

- Air inlet pressure < 0,5 bar

START-UP DIAPHRAGM PUMP / PLANT

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).

AERATING (BLEEDING) OF APPLIANCE / PLANT

Any air remaining in the diaphragm pump and in the system must be removed completely.

Check whether the suction system (suction tube) is immersed in the fluid, or the cup is filled with fluid. Operate the spraying equipment.

- Open compressed air valve slowly until the diaphragm pump starts (air pressure approx. 0.5 bar).

- Maintain fluid pressure on diaphragm pump < 1 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 it 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 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 material 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. 6.50.35-P, page 04) (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.



Never place the spraying equipment directly on any part of the body.



Never direct spraying equipment at humans or animals.

OPERATION

The diaphragm pumps run automatically, i.e. during operational shutdown (no material 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.6.50.35-P, page 04).

Therefore leakages in the fluid pressure system must be detected and removed by making regular checks (for very slow drop in pressure using a fluid pressure manometer).

It is also 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, "ASE" phenol, 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, REPAIRS

MAINTENANCE AND INSPECTION

Diaphragm pumps / systems 001.085-dp require little maintenance.

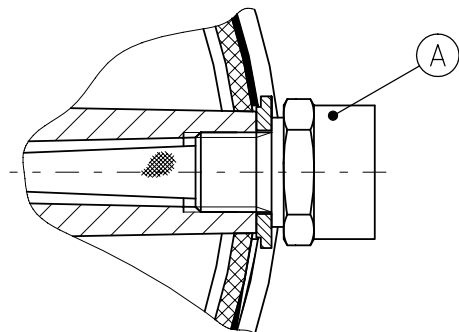


Fig. 28

- To avoid increased wear and tear of control components through contaminated air a filter (A) is fitted on 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 in heavily used pumps 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 with 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 operated. 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.

Regularly watch the diaphragm pump during operation!

Abnormal symptoms such as

- large fluctuations in pressure, changes in running noise and irregular operation are usually an indication of progressive wear of the diaphragms or control parts. Replacement of the diaphragms in good time will prevent any damage.

- Always replace both diaphragms.

(See troubleshooting, page 29)

REPAIR



All repairs must be performed by qualified engineers.



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 material has passed through must be strictly avoided. It will damage or destroy important component parts.

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

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



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

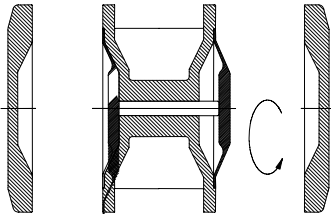


When traces of wear can be seen on running or sealing surfaces the components affected must be exchanged.

DIAPHRAGM REPLACEMENT

DISMANTLING

1.

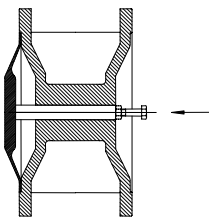


Loosen and remove all cylinder screws and remove both housing covers.

Hold the left diaphragm, remove the right diaphragm by hand.

Fig. 29

2.

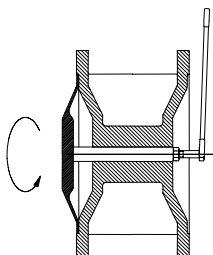


Screw in screw M8 into the rod, lock with the check nut.

Press the left diaphragm with the rod into the opposite end position.

Fig. 30

3.



Loosen the screw using spanner SW 13.

Remove the diaphragm by hand.

Fig. 31

ASSEMBLY

4.

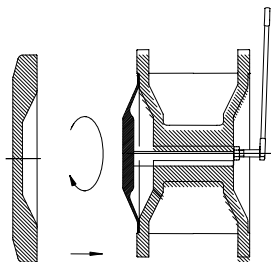


Fig. 32

Screw the left diaphragm firmly to the rod.



Do not use any pliers for securing and holding

Pre-assemble the housing cover.

- Lightly tighten the cylinder screws crosswise by hand.

5.

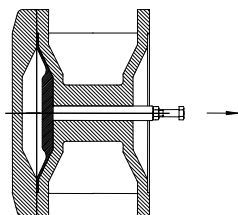


Fig. 33

Pull the rod at the screw evenly into the right end position.

Retighten the cylinder screws of the left housing cover in turn with the specified torque (see page 28). Repeat the process until all screws have the same torque.

Loosen the check nut, remove the screw.

6.

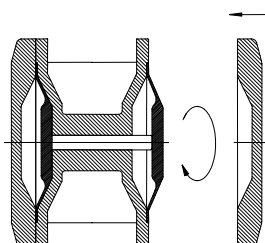


Fig. 34

Screw the right diaphragm firmly by hand to the rod.

Install the right housing cover.

- Tighten the cylinder screws crosswise and then in turn with the specified torque (see page 28). Repeat the process until all screws have the same torque.



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

REPLACING CONTROL DEVICES

- Remove a housing cover, lining plate and insulation mat (opposite to the air connection).
- Unscrew the cylinder screws ①.
- Remove the plate ② with flat gasket seal ③.
- Lift out sliding seat ④ using two screwdrivers.
- Remove flat slide ⑤.

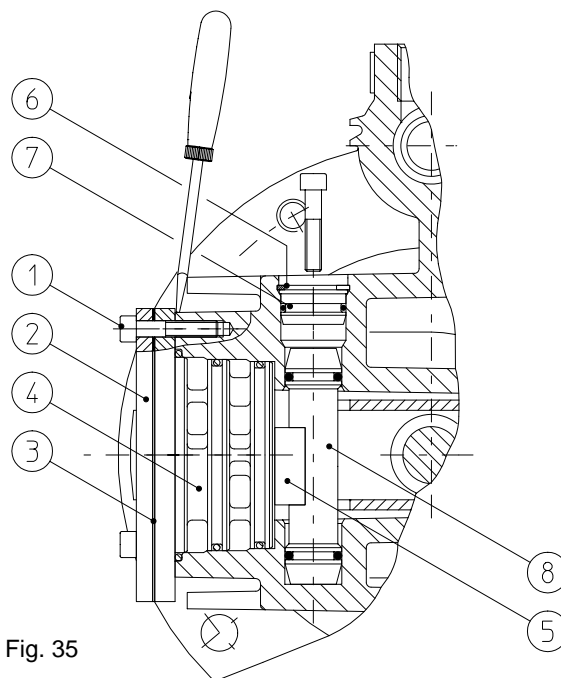


Fig. 35

- Dismantle 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 gasket seal (3) on the slide seat (4) in such a way that the channels in the slide seat are completely covered
- turn the flat gasket seal if necessary.



The hole (9) in the sliding seat (4) aligns with the arrow (10) on the housing.

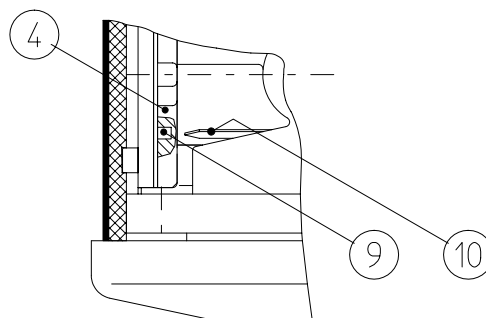


Fig. 36

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 place the O-ring in the housing and then insert the valve seat.

Assemble the pressure and suction valves in the reverse order.

ROD REPLACEMENT

- Remove the diaphragms (see page 24).
- Remove the control system (see page 25).
- Pull off washers (8) using flat pliers – DIN 5248.

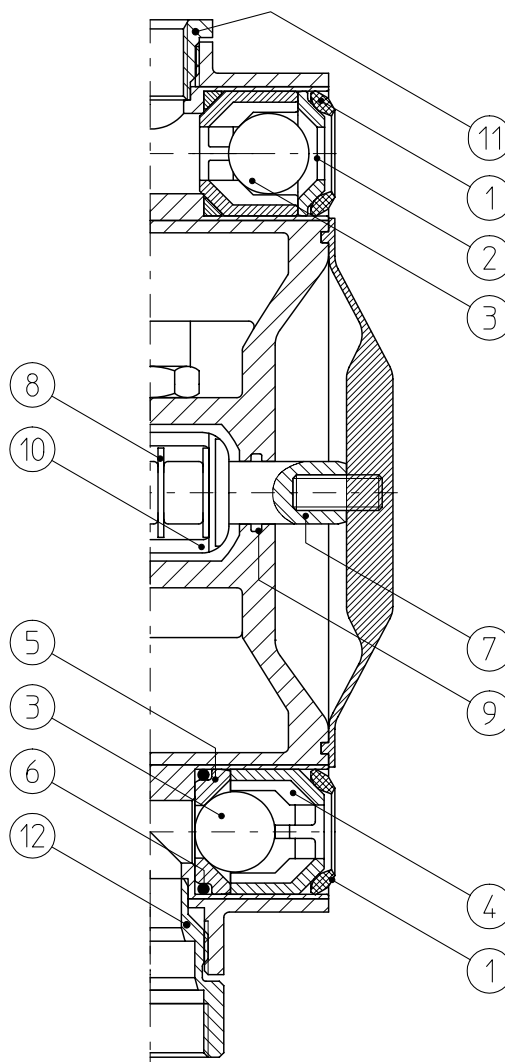


Fig. 37

- Pull rod out of housing sideways
 - Always replace the O-ring (9) with the rod. The carrier (10) is now uncovered

Assemble the pressure and suction valves in the reverse order.

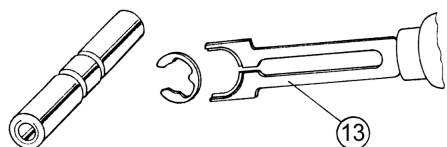


Fig. 38

A special tool is required to mount the safety washers on the rod - a "grip (13)" (see List of Tools).



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

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



In the SST version, the sleeve (11) – page 26 – and the connector (12) – page 26 – are joined to the diaphragm housing with adhesive. The parts cannot be replaced individually.

REPLACING THE SUCTION UNIT

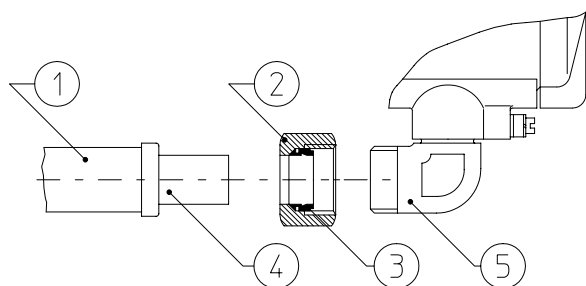


Fig. 39

When the suction unit (1) must be replaced, the union nut (2) must be replaced along with it.

- Union nut with sealing ring,
Part No. 75089 100002.

If the sealing ring (3) is defective, it can be pulled off the free tube end (4) after loosening the union nut.

After this, slide the new sealing ring on the tube end (4), with the inner metal taper directed to the stop ring – Sealing ring, Part No. 75188 097002.

For assembling the suction system and assembly control see page 18.



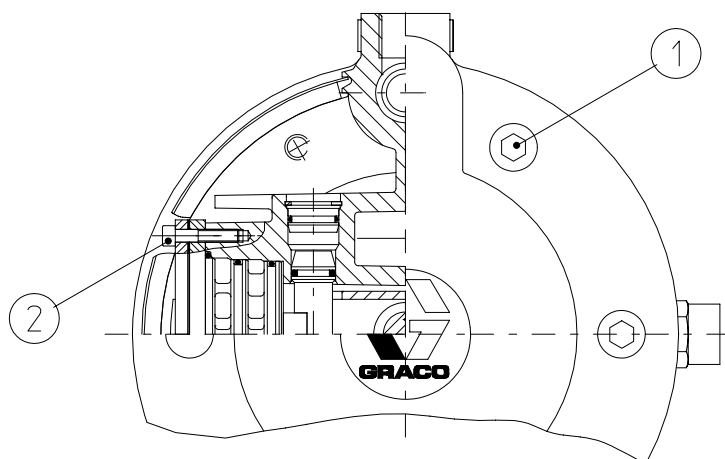
Fig. 40

THREADED CONNECTIONS



Do not exceed the tightening torques below when tightening screws.

TIGHTENING TORQUE



Ref.	Screw	Tightening torque
1	M 8 – 8.8	8 Nm
2	M 4 – 8.8	3,1 Nm

Fig. 41

SHUT DOWN

FOR A SHORT PERIOD

- Shut off the compressed air supply.
- Relieve the pressure of the diaphragm pump by removing all fluid, e.g. by engaging the gun.

FOR A LONGER PERIOD, FOR THE COMPANY HOLIDAY PERIOD

- Thoroughly flush the diaphragm pump (if necessary flush before and after).
- Leave neutral flushing liquid in the diaphragm pump.
- Shut off the compressed air supply.
- Relieve the pressure of the diaphragm pump by removing all flushing liquid, 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 empty 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 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	Compressed air too moist, stroke frequency too high, local-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 does not start, pressure fluctuations	Strainer clogged, max. suction height exceeded, hose or seal defective	Fluid contaminated, installation of diaphragm pump incorrect, improper	Clean strainer, Check tech. Specifications, replace defective parts
Fluid pressure system	Pump does not start, stalls during operation	Hose line kinked Spray gun clogged	Improper handling, fluid contaminated	Check hose line, Clean spray gun

NOTES

SELF-CHECK



If diaphragm pumps / systems 001.085-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 the national regulations and specifications currently in force are binding for the installation, starting up and operation of the diaphragm pump 001.085-DP.

USER INFORMATION

The user information (operating instructions) contains all necessary information about the proper use of 001.085-DP diaphragm pumps / systems.

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.

DIAPHRAGM PUMP 001.085-DP

Air-powered, double-action diaphragm pumps 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 the compressed air control (slide control) (2), the diaphragms (3), the housing covers (4), the suction (5) and pressure valves (6) as well as the suction (7) and pressure connection (8).



Fig. 1

The diaphragms divide the operational chambers into an air chamber on the housing side, and a fluid chamber at the cover side. The rod (9) connects the diaphragms with each other.

During operation the air chambers are filled with air on an alternate basis by the flat slide (10), that is driven by the rod, causing the diaphragms to perform suction and pressure strokes.

The fluid is sucked into one of the two fluid chambers through a suction valve. At the same time, the fluid is forced from the other fluid chamber into the pressure system (11), through the pressure valve. 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 the pump is supplied again with fluid from the pressure system, it starts automatically. Even minor leakage will be replenished.

A safety valve (12) incorporated in the diaphragm pump prevents the maximum permissible air inlet pressure from being exceeded. The filter screen (13) in the air inlet (14) ensures that any contamination from the compressed air system does not enter the pump's control system.

The integrated silencer (15) ensures that a separate silencer is not necessary.

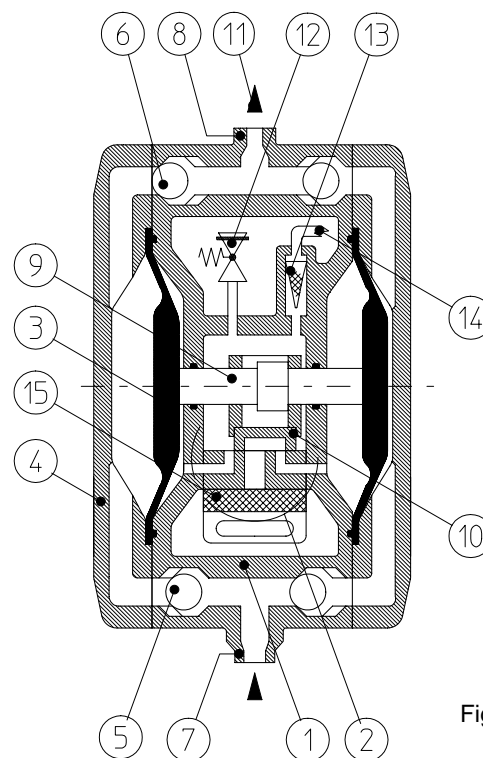


Fig. 2

Subject to change

Page 1 to 8

Prepared by 20.04.01 Hilse

Checked 25.04.01 Brink

USER INFORMATION - TECHN. PRODUCT DESCRIPTION -

Issued 04.01


B. 6.50.35-P

SUITABILITY, FLUID (-viscosity), USE

TASK, BEHAVIOR	SUITABILITY
<u>Supply application</u>	
Conveyance	++
Careful conveyance	Δ
Dosing	Δ
<u>Suction behavior</u>	
Automatic suction	++
<u>Tendency to</u>	
Adhere, stick	Δ
Deposit	Δ
Foam	+
Coagulate	-
Crystallizing	-

MATERIAL	
<u>Kinematic viscosity</u> in mm ² /s	
up to 500	++
500 up to 750	+Δ
over 750	Δ up to ?
<u>Solids content</u>	
None	++
Low to 1%	+
Medium, 1 to 10%	+Δ
Over 10%	Δ?
Over 50%	-
<u>Gas content</u>	
Very low	++
Low	+
High	Δ
<u>Behavior</u>	
Neutral	++
Corrosive	++
Abrasive	Δ
Caustic	Δ
Toxic	++
Flammable, danger classes AI, AII, AIII	++ ¹⁾

PROCESSING OF	SUITABILITY
Oil, diesel fuel, heating oil,	
Emulsions	++
Paint, containing solvent	++
Water laquers	++
Dispersions	++
Latex	++
Print colors	Δ?
Hardening agent	++
Solvent	+Δ
Alcohol	+Δ
Water, waste water	++
Soap, cleaning agent	++
Clay sludge, lime sludge	Δ?
Glazing	+Δ
Natural and synthetic	
Water- and solvent-based	
resins	+
Wood preservatives	++
Fiber material, cellulose	-
Sludge, mash, paste	-
Adhesive	?

USE	
Area with explosion hazards	
 II2G ²⁾	++

REMARK	
Please consult us in the case of aggressive (caustic) fluids.	?

++ very suitable + suitable
Δ suitable under - unsuitable
certain conditions
? application must be tested

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 gas, vapor, mist, air mixtures are present. Surface temperature of the pump max. 50° C (unheated fluid).

Materials containing chlorinated hydrocarbons (halogenated chlorinated hydrocarbons)



e.g. trichloethene 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 001 . 085 - D P

Pressure ratio

001 = 1:1

Fluid flow volume

in cm³ / stroke

085 = 085 cm³/stroke

Additional detail

E.G. W = Wall Model

G = Container model

F = Mobile model

H = Lift model

S = Model on stand

Type of drive: pneumatic

Action: double-action oscillating

PRODUCT RANGE

Diaphragm pump	Material ¹⁾	Part no. (basic version)
001.085-DP	Al	79082 007002
	SST (1.4305)	79082 008003

¹⁾ wetted area

For detailed information on various models, accessories and part Nos. see sales catalog 02.5008.

DATA

Fluid volume flow max.	32 l/min	(free discharge)
Fluid volumes	170 cm ³ /double stroke	(PT10.006)
Compressed air	dry, not lubricated	(moisture compressed air with high stroke frequency and high pressure leads to icing of the control system - increased pulsation until standstill)
Compressed air temperature	15 to 45°C	
Minimum air inlet pressure	0.5 bar ²⁾	
Air inlet pressure max. perm.	8 bar	
Ratio	1:1 ²⁾	
Operating pressure max. perm.	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, page 4)



Never pre-pressure the diaphragm pump.

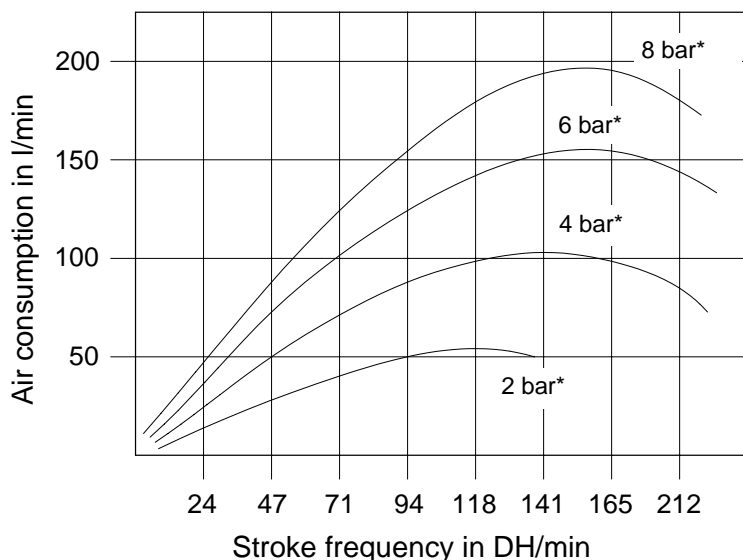
DH = Double stroke

²⁾ diaphragms retracted

Max. permissible stroke frequency n DH/min			
Continuous operation		Intermittent operation	
- Full load	- Partial load	- Full load	- Partial load
100	140	160	220

Min. permissible stroke frequency
(uninterrupted delivery)
1 double stroke in 15 min ¹⁾

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

Fig. 3

Stroke frequency as a function of the flow rate v							
v = 0.4 m/s		v = 0.7 m/s		v = 1.5 m/s		v = 3.0 m/s	
Stroke frequency in DH/min	Volume flow in l/min	Stroke frequency in DH/min	Volume flow in l/min	Stroke frequency in DH/min	Volume flow in l/min	Stroke frequency in DH/min	Volume flow in l/min
16	2.7	28	4.7	60	10.2	120	20.4

SOUND EMISSION

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

Measurement spacing

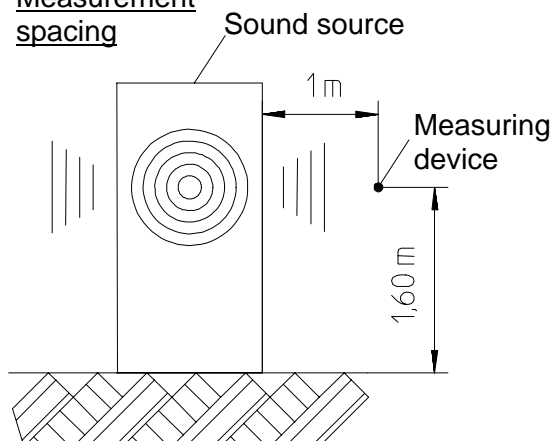


Fig. 4

Sound pressure in dB(A) at 50 DH/min	Air inlet overpressure in bar			
	2	4	6	7
	72	76	78	80

A warning sign is attached to the diaphragm pump.



Fig. 5

CONSTRUCTION MATERIALS

OF WETTED PARTS

Ref.	Description	Material	
		SST models	Al models
1	Diaphragm housing	-	Al
2	Diaphragm	PTFE	
3	Housing cover	1.4308	Al
4	Ball	1.4125	-
5	Valve seat	1.4305	
6	Profile sealing ring	PA	
7	Ball	POM	
8	Ball guide	FPM	
9	O-ring	FPM	
10	Coupling sleeve	1.4305	-
11	Sealing washer	POM	
12	Sleeve	1.4305	-
13	Sleeve	1.4305	-
14	Connector	1.4305	-

SST models

Al models

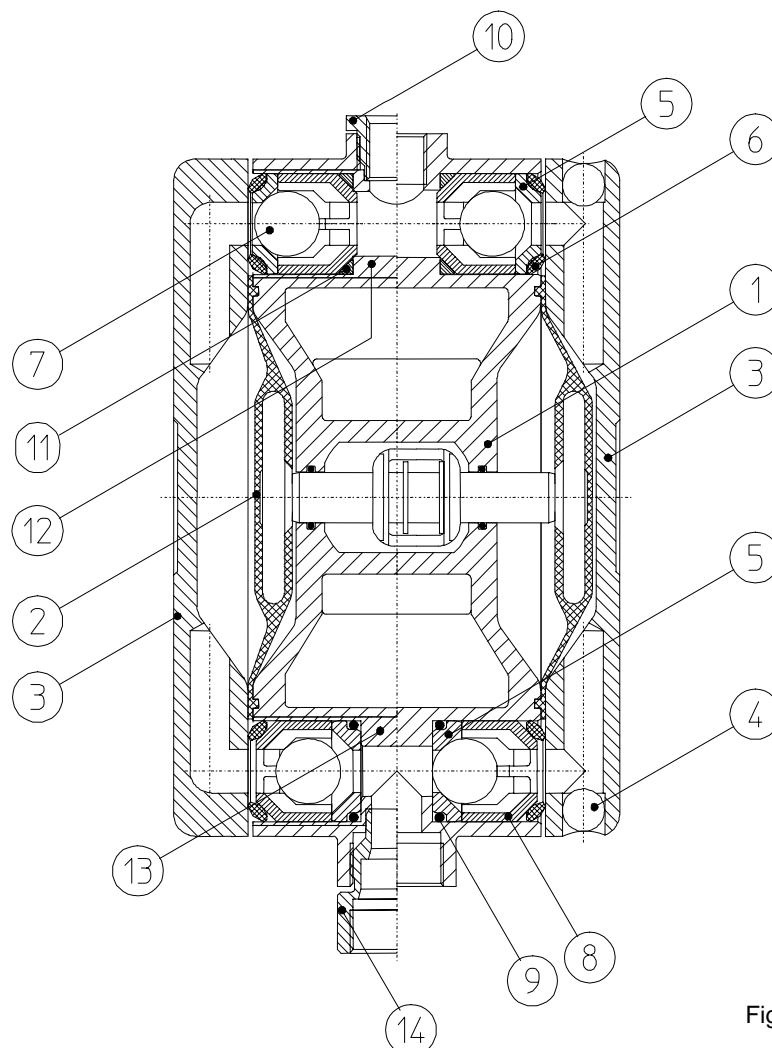
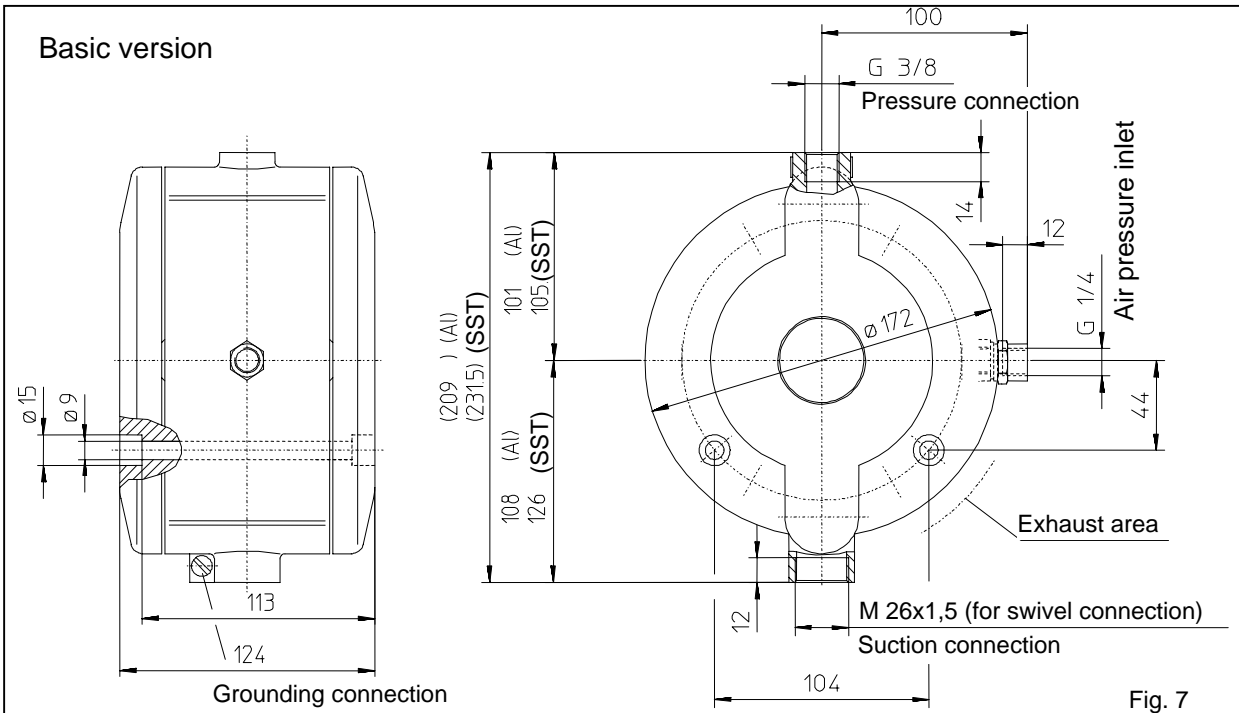


Fig. 6

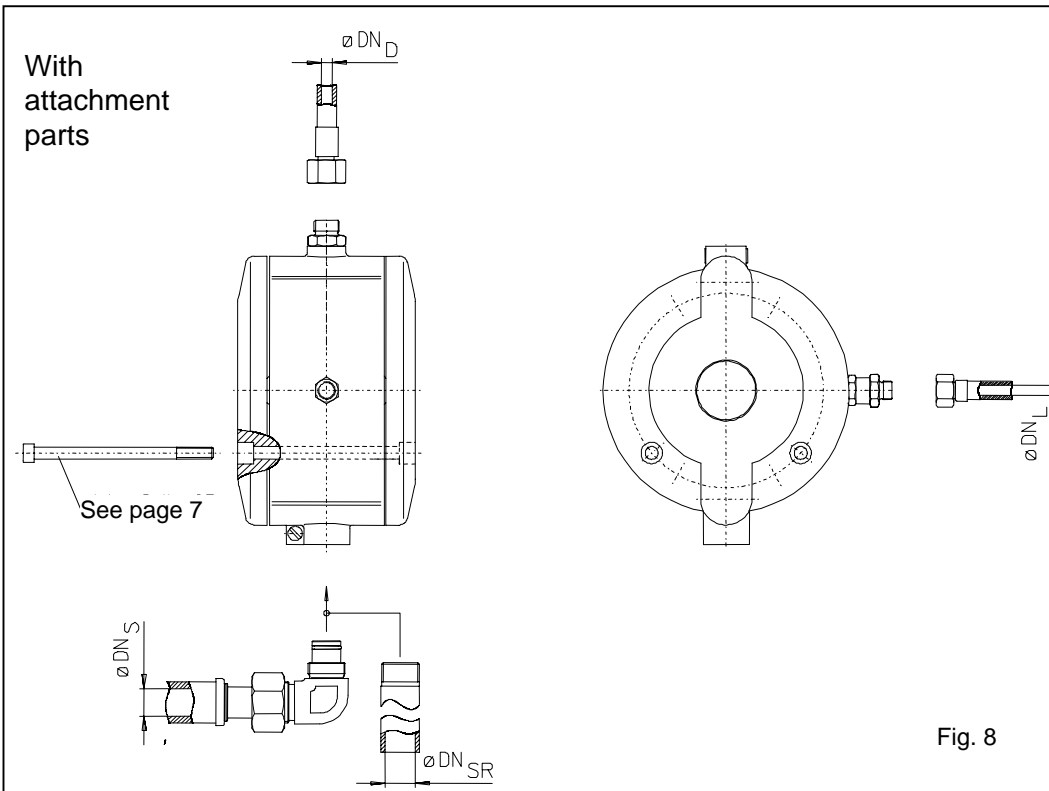
DIMENSIONS, SCREW CONNECTION THREADS, RATED DIAMETER OF CONNECTIONS, MOUNTING POSITION



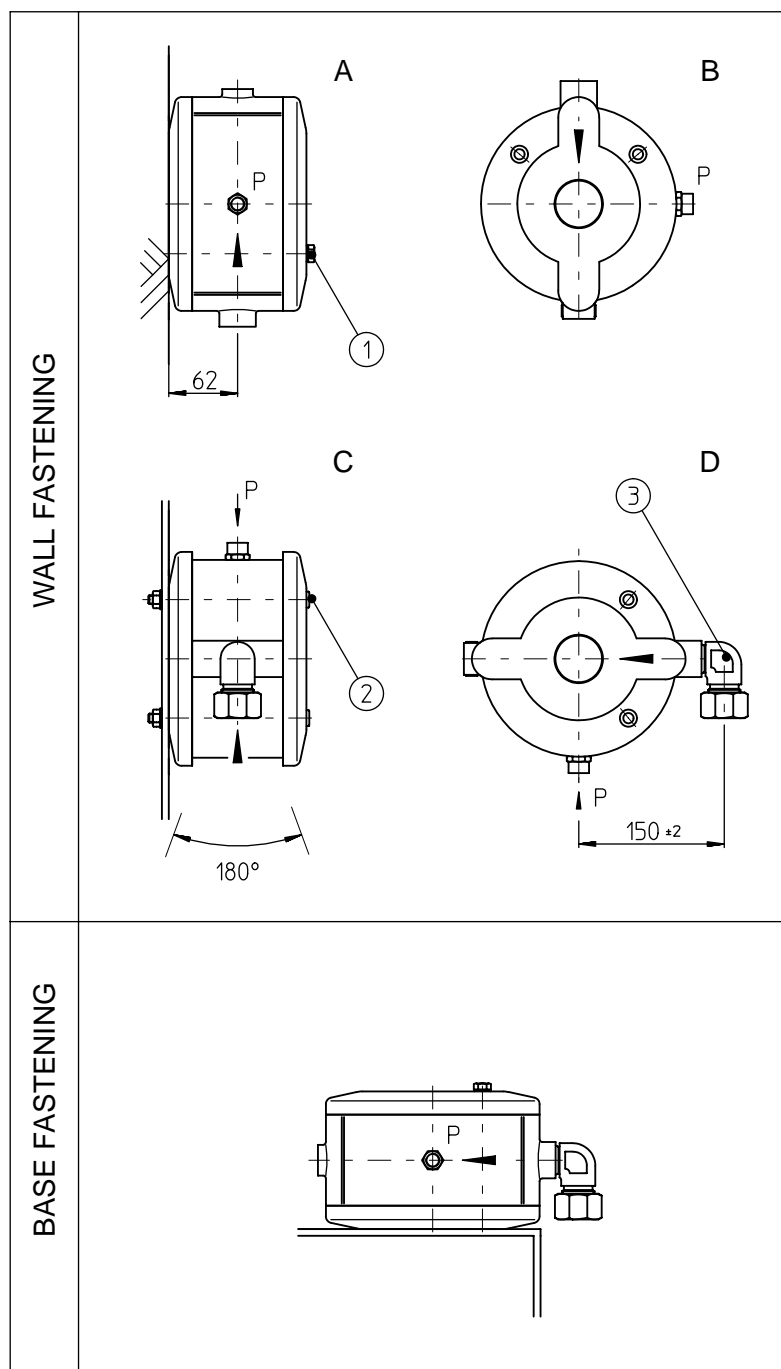
Air pressure pipeline	DN_L	\geq	8
Fluid pressure line	DN_D	\geq	9.5
Fluid suction line	DN_S	\geq	19
Suction tube	DN_{SR}	\geq	21

Elastic connections

Diaphragm pump - compressed air system,
Diaphragm pump - fluid container/
Fluid line necessary



ATTACHMENT POSITION



- ① Accessory kit,
(wood screw, plug).
Part no. 79977
082003.
 - ② Cylinder screw M8x130,
Part No. 74006 095033
For attachment to a
machine wall
(2 x required).
 - ③ Connection piece,
M26x1.5 x G3/4A,
Part No. 77741 131002
(swivel 180°).
- Flow direction
- P Compressed air connection

Fig. 9

Attachment position	Suction height (pump empty, valves wetted) in m	Different attachment position, remark
A	2.5	
B	-	Only in connection with suction cup ≤ 5l
C	2.5	Verify the swivel range of the suction connection
D	2.5	Verify the swivel range of the suction connection
E	3.5	Verify the swivel range of the suction connection

NOTES

ACCESSORIES

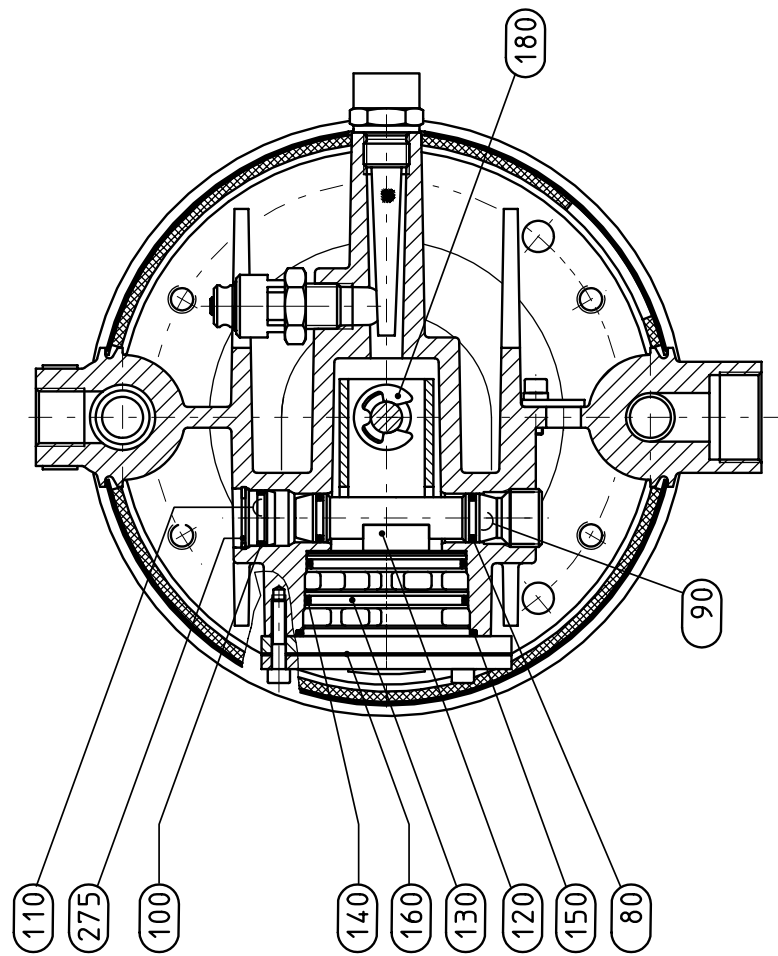
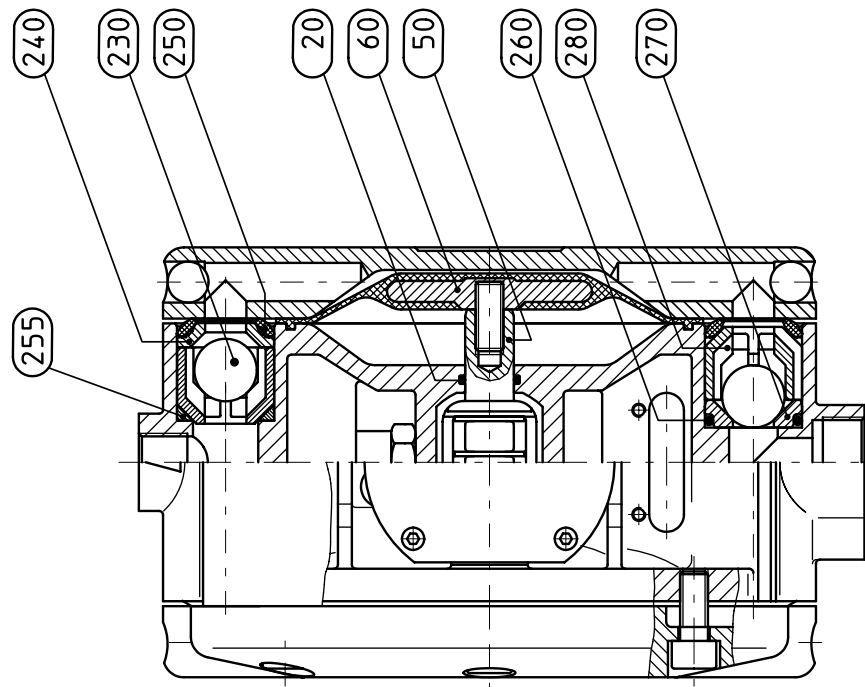
The original accessories – see user information B. 6.50.35-A – have been tested and verified by us.

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 under certain circumstances have an adverse 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.

DIAPHRAGM PUMP 001.085-DP



Note protection mark in accordance with DIN 34

Prepared by 11.04.01 Hilse		USER INFORMATION REPAIR PARTS SET	Page 1 of 2	
Checked 11.04.01 Brink			Issued 04.01	B. 6.50.35-EO

DIAPHRAGM PUMP NO. 001.085-DP

Replacement part set, diaphragm			Part No. 79978 908103	
Ref.	Number	Description		
60	2	Diaphragm	D 123	
250	4	Profile sealing ring	17.2 x 28.2 x 5.4	

Replacement parts kit, seals - control			Part No. 79978 908104	
Ref.	Number	Description		
90	1	Drive rod assembly	-	
110	1	Plug assembly	D 16	
120	1	Flat slide	24 x 19	
130	1	Valve seat	-	
140	2	O-ring	42 x 2 B	
150	1	O-ring	48 x 2 B	
160	1	Flat seal washer	72 x 58 x 0.5	
250	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 089001	
Ref.	Number	Description		
230	4	Ball	18 mm	
240	2	Valve seat	D 12	
250	4	Profile sealing ring	17.2 x 28.2 x 5.4	
255	2	Profiled ring	20 x 27.9 x 4.6	
260	4	O-ring	22 x 3 B	
270	2	Valve seat	D 12	
280	4	Ball guide	Ball 18	

Replacement parts kit, rod			Part No. 79978 908107	
Ref.	Number	Description		
20	2	O-ring	14 x 2 B	
50	1	Rod	D14 L72	
80	2	O-ring	10.82 x 1.78	
100	1	O-ring	13 x 1.5 B	
140	2	O-ring	42 x 2 B	
150	1	Flat seal washer	48 x 2 B	
160	1	Flat seal washer	72 x 58 x 0.5	
180	2	Lock washer	9	
250	4	Profile sealing ring	17.2 x 28.2 x 5.4	

**REPLACEMENT DIAPHRAGM PUMP
ACCESSORIES**

(Sales catalogue 02.5008-except)

Diaphragm pumps, standard models

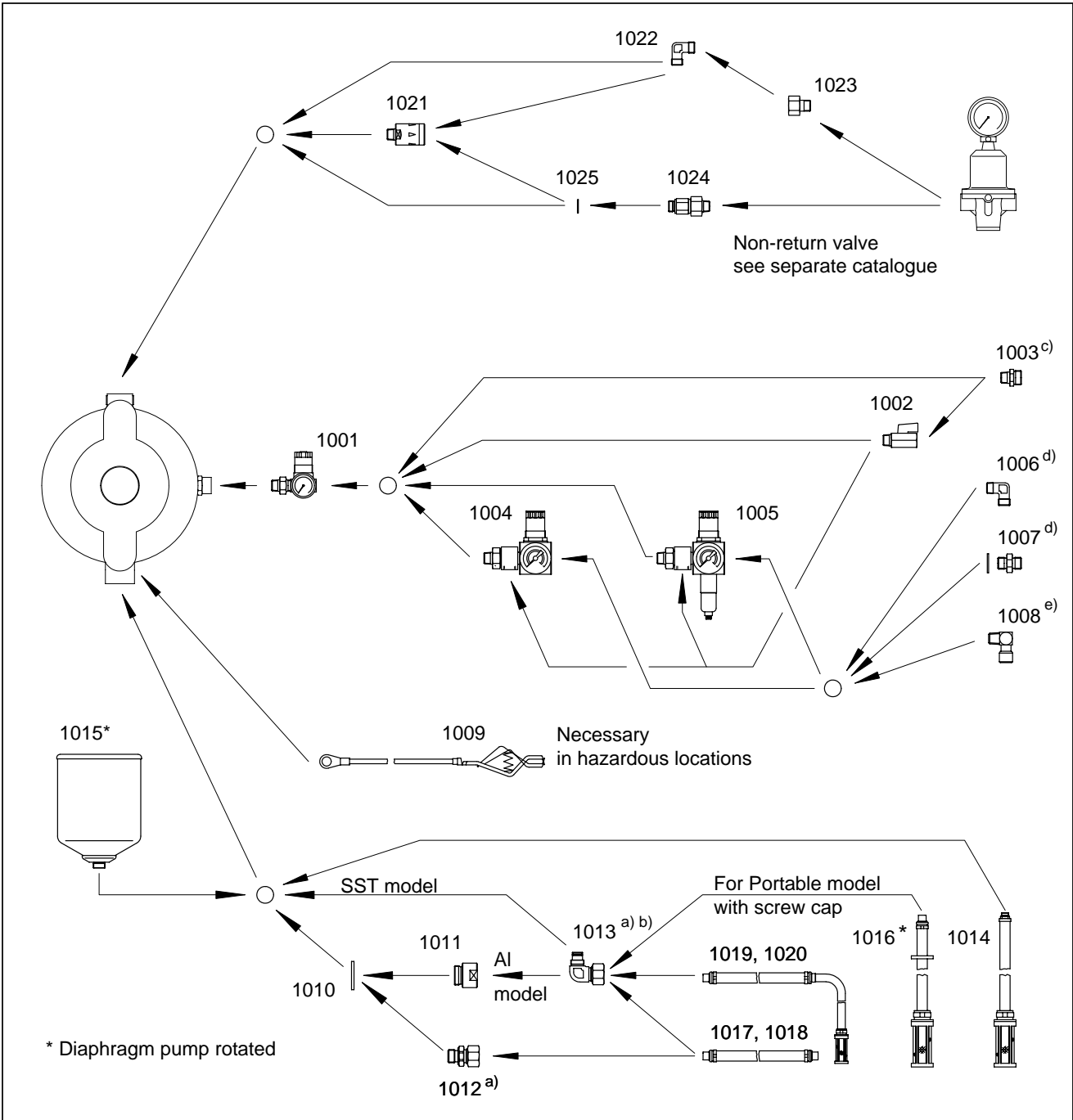


Diaphragm
pump no. 001

- without accessories

Ref.	Model	Weight (kg)	Part No.
002	AI	4	79082 007002
003	SST (1.4305)	7	79082 008003

Accessories



Note protection mark in accordance with DIN 34

Subject to change

Page 1 of 2

Prepared by 15.03.01 Hilse	USER INFORMATION - REPLACEMENT EQUIPMENT -	Issued 03.01
Checked 15.03.01 Brink		B. 6.50.35-A

	Ref	Description	Material	Notes	Part No.
Air pressure inlet	1001	Pressure regulation	-	R ¼	77631 014002
	1002	Ball valve coupling	-	PN15 R ¼ – G ¼	77601 005002
	1003	Nipple	-	8 R ¼ tap. – M22x1.5	76639 204001
	1004	Air pressure inlet	-	R ¼ for gun	77522 010002
	1005	Air pressure inlet	-	R ¼ for gun, with filter	77522 005002
	1006	Angular union	-	R ¼ tap. – M14x1	75214 006002
	1007	Nipple	-	6 - M14x1 – G ¼	76639 014001
	1008	Plug	-	R ¼ tap. – 8	75202 001008
Grounding	1009	Ground wire	-	Length 8m	73483 001011
Suction connection	1010	Seal	PA 6	15 x 24 x 4	76188 014002
	1011	Connector	CrSt	G20 – M26x.5	76641 115002
	1012	Adapter union	SST	GE22 – ZLM-ED	75204 010004
	1013	Connector	SST	M26x1.5 x G3/4A	77741 131002
	1014	Suction tube	SST	30l container/M26x1.5	78808 018002
	1015	Cup, cpl.	SST	5l – M26x1.5	77683 055002
	1016	Suction hose	SST	D22 30l container	77848 021002
	1017	Suction hose	SST	D22 L1000	77848 035009
	1018	Suction hose	SST	D22 L1600	77848 035010
	1019	Suction hose	SST	30l container with filter	78848 020006
	1020	Suction hose	SST	200l container with	78848 020007
Pressure connection	1021	Check valve	SST	DN10 G3/8	77588 003001
	1022	Bracket	SST	8 – G3/8 flexible	77214 017003
	1023	Ball nipple	SST	G3/8 disconnectable	77254 008003
	1024	Detachable union	SST	R3/8 tap. – G3/8	77240 005002
	1025	Seal	PA 6	A 14 x 18	74188 012050

- a) Replacement washer, Item ID. 75188 097002 for Ref. 1012 and 1013
- b) Replacement O-ring, Part No. 74186 026020 for Ref. 1013
- c) Connection thread M22 x 1.5
- d) Connection thread M14 x 1
- e) For hose DA 8

Order Example

Please lay out each order as follows:

Description	Ref.	Part No.
Diaphragm Pump No. 001.085-DP	002	79082 007002

See complete GRACO catalogue for other accesories.

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.

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, PERFORMANCE 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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