

**ALMATEC Pneumatic Diaphragm Pump
AD 6
Operating and Installation Instructions**



ought to be studied before installing the pump

The ALMATEC Maschinenbau GmbH is certified as a modern, quality-orientated enterprise according to DIN EN ISO 9001:2000. Before release for dispatch, any pump has to undergo an extended final control.

Before starting operation of the pump, it must be ensured that the pump materials are sufficiently resistant to the material to be pumped. All housing parts, diaphragms and valves exposed to the medium are made of PTFE-TFM (housing nut made of PVDF).

Operation in explosion-proof areas and for inflammable liquids (Reg.-No. PTB: 03 ATEX D004)

For inflammable liquids as well as for applications in explosion-proof areas, only pumps with housings and fittings in conductive plastic materials may be used. The AD 6 with the housing material PTFE-conductive meets this requirement. With the exception of being used as submersible pump, the AD 6 has to be grounded. All housing parts are connected, therefore it is not necessary to ground single parts. Piping systems and product connections have to be grounded separately. To avoid ignition hazards the formation of dust deposits on the pumps must be prevented. In explosion proof areas repair working only after careful inspection of the practicability and only with appropriate tools. The "X" in the following marking stands for the max. operating temperature, which is 100°C for the AD 6.



Technical data	AD 6
Dimensions (mm): diameter height	78 150
Nominal width of connections:	
suction port	R 1/2
discharge port	R 1/4
air inlet	R 1/8
air exhaust	R 1/4
Weight (kg)	1,2
Max. size of solid particles (mm)	1
Suction head, dry (mWC)	3
Suction head, wet (mWC)	9
Max. driving and operating pressure (bar)	7
Max. operating temperature (X) (°C)	100
Max. viscosity (cP)	1000
Max. sound pressure level at full load acc. to DIN 45635 part 24, depending on the operating data of the pump [dB (A)]	71

Installation and operation

The four available connection points are identified by letters: S = suction port, D = discharge port, Z = air inlet and A = air exhaust.

Two different connection kits are available as accessories. The "connection kit, sampling" comprises an inlet strainer for the suction port and hose connections for air inlet, air exhaust and discharge port. The "connection kit, laboratory" comprises hose connections for suction port, discharge port and air inlet. In general, the pump has to be connected load free. Neglecting this causes leakage and maybe even damages. Before connecting the pump, take the yellow blind plugs out of the ports. The connections of the AD 6 have slightly tapered threads. Use threadseal only sparingly.

To facilitate the installation and maintenance shut off valves should be installed right before and after the pump. The nominal width of the connection pipes has to be chosen in accordance to the connections of the

pump. A smaller piping can cause cavitation (suction line) as well as a loss of performance (suction and discharge line). In case the pipe is too big, the dry suction capacity of the pump can decrease. Seal the suction line diligently; hosepipes should be suitably armoured. A suction line continuously rising will prevent the formation of air locks in the line which would affect the suction lift.

Before installation make sure that the air supply pipe is free of solids. To supply the pump with driving air sufficiently, the pipe diameter should match the size of the air inlet. Take care that no dirt or particles can intrude into the pump during the connection, as these can accumulate inside the pump and can cause malfunctions. The integrated air control system *PERSWING P®* is a precision-control that requires oil-free, dry and clean compressed air for optimal function.

The pressure of the driving air has to be limited to the amount required to meet the performance needed. Excessive pressure increases both the air consumption and the wear of the pump. The pump is regulated by tuning the flow rate of the air. An empty pump has to be driven slowly (e.g. via a needle-valve). The pump starts automatically.

ALMATEC pneumatic diaphragm pumps are self-priming when dry, thus it is not necessary to fill the suction line of the pump. The suction lift capacity of a liquid-filled pump, however, is much higher. The pump is appropriate for running dry during slow operation. Dry running at high stroke frequency causes premature wear. The maximum permissible stroke frequency during nominal performance is 800 per minute. The pumps can briefly (up to max. one hour) be operated against a closed discharge line. Throttling on the suction side may damage the pump.



- Installation, operation, and maintenance by qualified staff only.
- Pressure tests of the plant a pump is included in may only be carried out with the pump disconnected from the pressure on both ports or by using the pressure the pump develops while operating. The load of a pressure in the plant may damage the pump.
- Pneumatic diaphragm pumps must not be operated with a positive suction pressure.
- Depending on the conditions of operation, the liquid conveyed might escape from the pump through the air exhaust in case of a diaphragm rupture.
- The relevant effective security advises have to be respected.
- Pools of liquid which appear in the near outer area of the pump have to be inspected on danger potential, if necessary safety measures are to be taken.
- Chemical and biological reactions in the product chamber of the pump (mixture of different substances) and the freezing of the liquid have to be avoided.
- Especially when deliver critical liquids, wear parts, like diaphragms, should be replaced within a preventive maintenance.
- The use of non-original ALMATEC spare parts and structural changes lead to the lapse of the warranty immediately. When operating such a pump, damages of properties and/or persons cannot be excluded.
- Before starting to disassemble the pump, take care that the pump has been emptied and rinsed. Further the pump has to be cut off from any energy on the air and product side. If the pump is being deported from the plant, a reference about the delivered liquid has to be attached.
- The relevant additional security advises ought to be respected, if the pump has been used for aggressive, dangerous or toxic liquids.
- The operation of the pump with nitrogen as driving gas is possible. In closed rooms a sufficient ventilation must be provided.

Disassembly and assembly advises

The AD 6 is of simple mechanical design. Special tools are not required for assembly or disassembly. The part numbers are specified in the spare parts list.

Unscrew housing nut [7] (right-hand thread) and then draw the front housing [1] off the rear housing [2]. Remove the O-rings, product channel [3]. Draw the air control system out of the rear housing [2] together with the diaphragms [10]. Unscrew both diaphragms [10] from the air control system. Unscrew suction valve [4] from the middle of the rear housing [2]. Screw out the plug [5] with a screwdriver and finally unscrew discharge valve [4]. The suction and discharge valves [4] in the front housing [1] must be removed accordingly.

The parts are basically assembled in reverse order to that described above. The following points apply additionally. The product valves [4] must be screwed in straight and with care. In order to ensure optimum operation of the pump, it is also essential to ensure that the product valves [4] are screwed in to precisely the specified depths. The two suction valves [4] must be screwed in to a depth of 2.5 mm as measured from the level surface or flush with the ends of the bevels. The discharge valve [4] in the front housing [1] must be screwed in to a depth of 12 mm and that in the rear housing [2] to a depth of 18 mm. Then screw in the plugs [5]. The two diaphragms [10] must be screwed onto the air control system until a slight resistance can be felt. Lightly moisten the O-rings [12] and carefully press the air control system with diaphragms [10] into the rear housing [2]. Before putting the pump back into operation, the tightness of the pump has to be checked.

Spare parts list

Item	Piece	Description	Material	Part number
1	1	Front housing	PTFE-TFM conductive	1 06 010 65
2	1	Rear housing	PTFE-TFM conductive	1 06 011 65
3	2	O-ring, product channel	Kalrez®	9 06 614 79
4	4	Check valve	PTFE-TFM	1 06 013 69
5	2	Plug	PTFE	1 06 017 60
6	1	Lock pin	PVDF	1 06 016 50
7	1	Housing nut	PVDF	1 06 012 50
8	2	O-ring, housing nut	FKM	9 65 616 74
9	1	Shaft	PETP	1 06 230 84
10	2	Diaphragm	PTFE-TFM	1 06 031 69
11	2	O-ring, diaphragm	TFA/Silicon	9 35 615 63
12	6	O-ring, end caps	NBR	9 36 504 71
13	2	End cap, cpl.	PETP	1 06 251 84
14	1	Main piston, cpl.	PETP	1 06 254 84
15	1	Muffler	PE	1 06 244 51
16	1	Cable pin	PTFE conductive	1 06 086 65

Connection kits

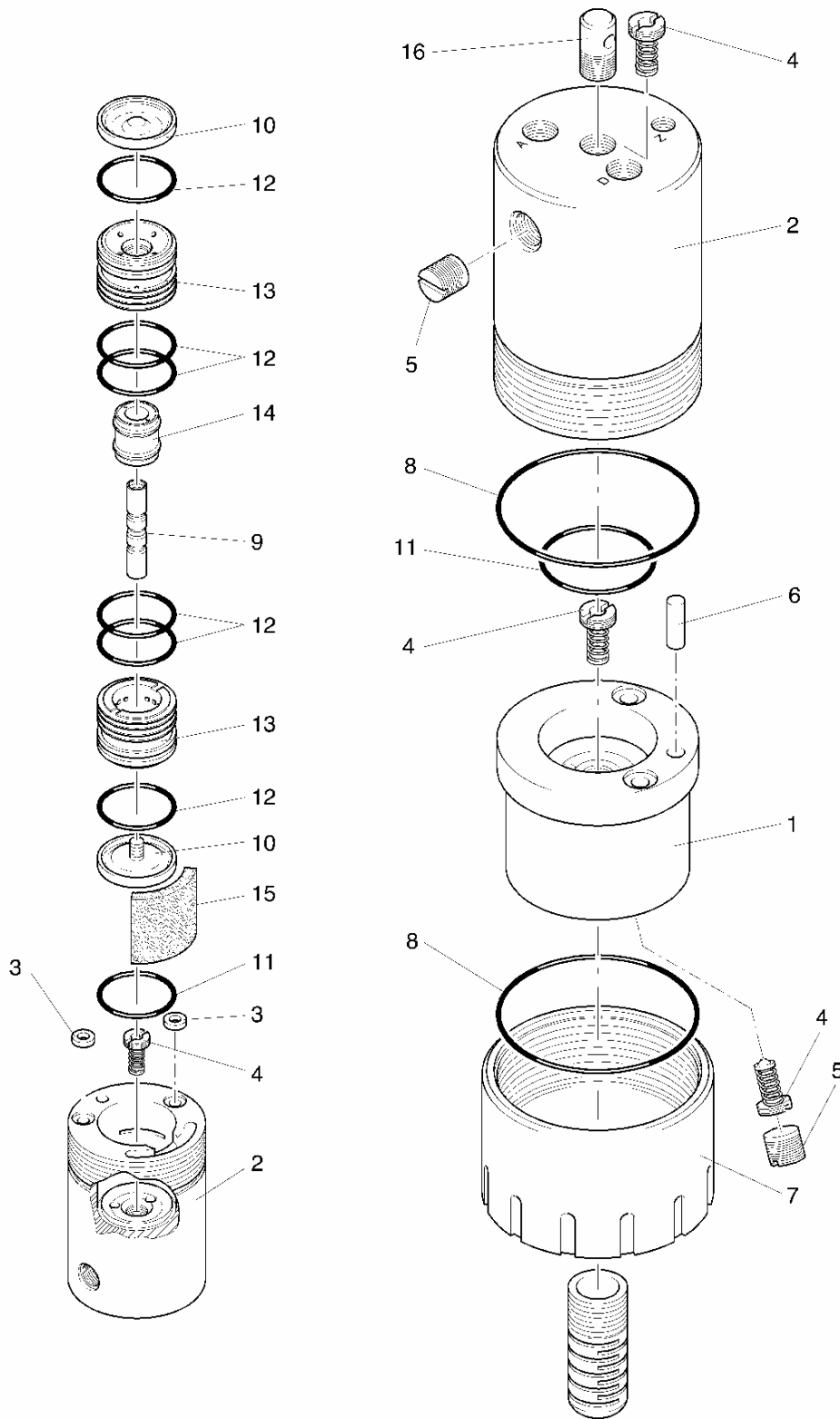
Piece	Description	Material	Part number
1	Connection kit, sample pulling, consisting of: Inlet strainer Hose connection, air inlet, for hose 6/4 Hose connection, air exhaust, for hose 10/8 Hose connection, discharge port, for hose 10/8	PTFE PVDF PVDF PVDF	AS6P
1	Connection kit, laboratory, consisting of: Hose connection, suction port, for hose 10/8 Hose connection, discharge port, for hose 10/8 Hose connection, air inlet, for hose 6/4	PVDF PVDF PVDF	AS6L

Spare parts, connection kits

Piece	Description	Material	Part number
1	Inlet strainer	PTFE	1 06 068 60
1	Hose connection, air inlet, for hose 6/4	PVDF	1 06 265 50
1	Hose connection, air exhaust, for hose 10/8	PVDF	1 08 265 50
1	Hose connection, discharge port, for hose 10/8	PVDF	1 08 265 50
1	Hose connection, suction port, for hose 10/8	PVDF	1 06 365 50

The serial number of the pump is required when ordering spare parts!

Exploded view



Subject to change without notice, 2007/01

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