



AH Series

High Pressure Diaphragm Pumps
made of Plastic and Stainless Steel

HIGH PRESSURE DIAPHRAGM PUMPS AH SERIES AT A GLANCE



- Plastic pumps (filter press feeding as typical usage)
- Stainless steel pumps (paint and varnish industry as main field of application)
- Double-acting principle of operation
- Discharge pressure up to 15 bar
- Max. capacities 4 / 10 / 20 m³/h (17 / 44 / 87 gpm)
- Automatic pressure/volume adjustment for filter press feeding
- No control or safety elements required for
 - dry running
 - over pressure
 - speed control
- Safe operation over the entire range of capacity without over pressure risk
- No drives, no rotating parts and no shaft seals
- Running dry capability
- Self-priming
- Easy start-up
- Gentle displacement by compressible drive medium
- Compact dimensions
- Specially developed heavy-duty diaphragms for long service life
- Corrosion-proof and abrasion-proof housings in solid design made of polyethylene
- ATEX conformity of the stainless steel models
- Integrated muffler
- Shock absorbers with female thread on the underside for simple direct installation (AH plastic only)
- Horizontal or vertical position for suction and discharge ports
- Ball valves with insensitivity to solids
- Replaceable ball valves and ball retainers
- Maintenance-free PERSWING P[®] air control system without dead center
- Optional features meeting requirements

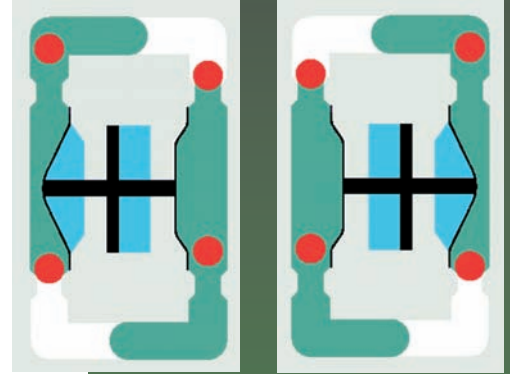


CERTIFICATES

ALMATEC is certified according to DIN EN ISO 9001:2008 and to DIN ISO 14001:2005. The requirements of the DIN EN ISO 9001 are fixed as minimum standard, with the endeavour to obtain a maximum of internal/external customer and supplier satisfaction by constant improvement, advancement and fault prevention in all phases of the value-added chain. In order to underline the relevance of the environmental policy the certification to DIN ISO 14001:2005 took place in the year 2006. Each enterprise in business world has a special responsibility to preserve the natural bases of life. Conscious usage and consumption of any resources, energy, raw as well as auxiliary and operational materials is a substantial component of our corporate culture.

FUNCTIONAL PRINCIPLE

The ALMATEC high pressure diaphragm pump series AH is based on the functional principle of double diaphragm pumps. The basic configuration consists of two external side housings with a center block between them. Each of the side housings contains a product chamber which is separated from the center block by a diaphragm. The two diaphragms are interconnected by a piston rod. Controlled by an air control system, they are alternately subjected to compressed air so that they move back and forth. The pressure booster centered between the diaphragms boosts the drive air pressure to more than twice its original value in the two product chambers. In the first figure, the compressed air has forced the left-hand diaphragm towards the product chamber and displaced the liquid from that chamber through the open valve at the top to the discharge port. Liquid is simultaneously drawn in by the right-hand diaphragm, thus refilling the second product chamber. When the end of the stroke is reached, it reverses automatically and the cycle is repeated in the opposite direction. In the second figure, liquid is drawn in by the left-hand diaphragm and displaced by the right-hand diaphragm.



SPECIAL DEVELOPMENT FOR FILTER PRESS FEEDING

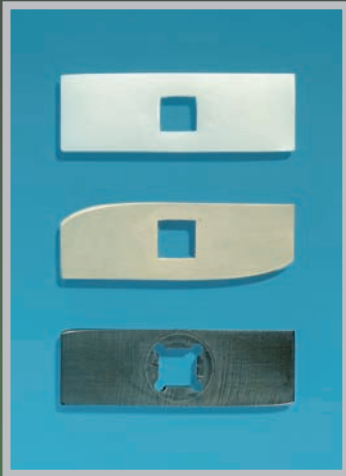
The series AH has been specially developed for feeding filter presses with chemical wastes and special sludge. With a maximum drive pressure of 7 bar, they can build up discharge pressures of up to 15 bar as a result of the internal booster. This yields a ratio of drive pressure/discharge pressure of more than 1:2. As genuine double-acting air-driven diaphragm pumps, the three sizes achieve maximum capacities of 4 m³/h (AH 15), 10 m³/h (AH 25), and 20 m³/h (AH 40). The following values can be quoted as a rough guide to the filter area of the press: AH 15 up to 12 m², AH 25 up to 30 m², and AH 40 up to 60 m². Decisive are the consistency of the sludge, the dry content and the dehydration capability always.

Air driven diaphragm pumps have a number of characteristic advantages for filter press feeding. Conventional displacement pumps with electric drive and control elements do not have these properties which are specific to the design of the pumps and which include run dry capability, good controllability and a gasketless mechanical design, to mention but a few. Operating against closed discharge is possible. There are no drives, no rotating parts, and no rotary shaft seals. The compressible drive medium permits gentle delivery with attenuated pressure peaks. Start-up is simple and the space required is considerably less than in the case of piston-actuated diaphragm pumps or progressive cavity pumps.

ALMATEC high-pressure diaphragm pumps of series AH can be ideally combined with filter presses, as the automatic pressure/volume adjustment clearly shows. At the beginning the low filter resistance causes delivery of a large volume, so that the empty filter press is rapidly filled. The rising filling level causes the volume to reduce automatically until the required standstill is reached (= volume 0) at the maximum permitted pressure without any control elements or safety elements protecting against dry running and excess pressure or speed control. Unlike mechanically driven diaphragm pumps, the AH pumps then stop and do not consume any further energy. This built-in control feature permits operation over the complete range of delivery volumes without any risk of excess pressure.



WEAR-RESISTANT HOUSING MATERIAL AND SOLID DESIGN



All wetted housing parts are made of ultra-high-molecular-weight low pressure polyethylene (PE UHMW) in heavy solid design. PE competes with PP (polypropylene) which is frequently used in the manufacture of pumps. Thermally and chemically speaking, there are virtually no differences between these two. However, the similarity ends where the mechanical properties are concerned: trials based on the sand-slurry method have shown that the abrasion resistance of the PE (upper material sample) is 7 times higher than that of PP (middle material sample) and even 1.6 times higher than that of steel (lower material sample). It is certainly also more wear-resistant than, for example, cast iron or aluminium. Polyamide (PA) is used for the center blocks. It is characterized by its exceptionally high mechanical strength.

The cheek construction with twelve housing bolts as the sole fastening elements forms a solid basic unit with the fewest possible seals and joins. Recessed housing bolts covered with PE caps and spring washers on large stainless steel discs reduce the surface pressure. The suction and discharge ports are made in solid design and equipped with flanges to DIN or ANSI (option) standards. Their position can be varied, depending on the application in question, thus permitting both horizontal and vertical connection.

OTHER SPECIAL FEATURES

ALMATEC high-pressure diaphragm pumps are equipped with specially developed heavy-duty diaphragms with integrated metal core for a long service life. The service life is extended once more by a supporting disc on the air side. The diaphragms are made of either EPDM, NBR or PTFE/EPDM-compound.

The metal-free, pneumatically pilot-operated PERSWING P[®] air control system ensures accurate reversal of the main piston and is characterized by low noise levels. Only two moving parts ensure that there is absolutely no dead center. It does not require maintenance, operates without any lubrication whatsoever and is made up of no more than four different parts. The complete cartridge can be replaced easily. The patented PERSWING P[®] is a precision control system and therefore requires clean, oil-free compressed air to ensure its optimal function.

The easy replaceable ball valves and ball retainers have been specially designed to make them particularly suitable for high pressures. They are insensitive to solids. The ball valves are available in the materials EPDM, NBR, and PTFE. The heavy-duty muffler in the center block is made of expanded PE. Noise is absorbed in two cascaded stages.

OPTIONAL EQUIPMENT

Stroke counting (code C): A sensor is installed in the center block to count the strokes. The diaphragm movement is scanned without contact by this sensor. The issued sensor pulses can be output to existing detectors or to a stroke counter (can also be supplied). When the preset value is reached, the stroke counter outputs a signal which can then be processed further, for instance in order to shut down the pump via a solenoid valve (available also in a pneumatic version).

Diaphragm monitoring (code D): A sensor installed in the pump muffler detects all liquids which occur because of a diaphragm damage.



STAINLESS STEEL DESIGN (AH-S)

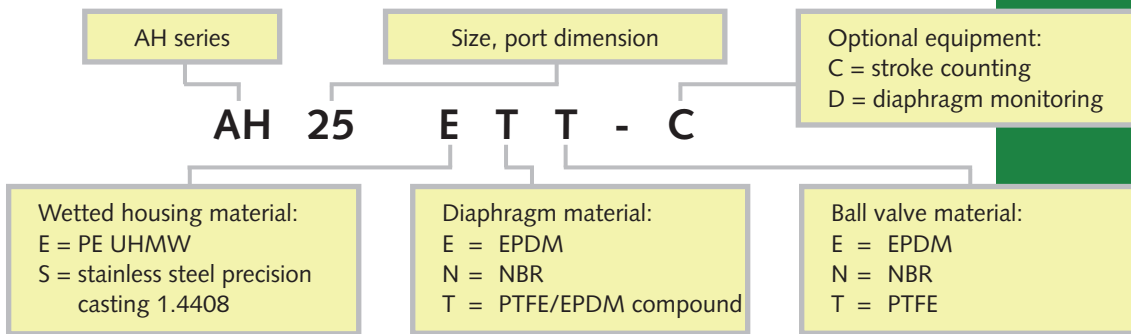
In addition to the described plastic models ALMATEC high pressure diaphragm pumps are available in stainless steel also. The pump sizes AH 20 S and AH 32 S achieve a max. capacity of 4 and 8 m³/h and a discharge pressure of 15 bar. Due to their ATEX conformity the pumps can be used in explosion-proof areas and for inflammable liquids.

The wetted housing parts are made of a rust and acid resistant stainless steel precision casting, manufactured in a lost-wax process. This sophisticated casting method yields a smooth and tight surface with increased resistance to corrosion. The housing parts are additionally glass-bead blasted and pickled. When developing the shape of the product chambers particular attention was paid for soft changes of direction, smooth flows and no dead corners. Free turnable suction and discharge ports enable a variable connection configuration. The non-wetted center blocks are made of conductive polyethylene (AH 20) respectively of aluminum (AH 32).

A typical field of application for the ALMATEC high pressure diaphragm pumps made of stainless steel is the paint and varnishes industry. In modern varnishing systems air-operated diaphragm pumps are frequently used for the transport of the paint. In this process a central paint supply with one pump only is increasingly common. The required pressures are naturally higher than using single pumps. Often the plants are designed for all-purpose using, meaning the plant should be able to varnish all current paints. Thereby, every change of the paint requires a complex cleaning process. Conventional units need many rinsing processes to avoid the mixture of the different paints. This costs time and a bulk of cleaning fluid. Additionally the ATEX conformity has a significant importance. ALMATEC high pressure diaphragm pumps considerably reduce the needed time and the consumption of the cleaning fluid. This leads to a quicker availability, an increase of the production periods and hence to an improvement of the operability and efficiency of the plant with less costs for cleaning agent.



CODESYSTEM

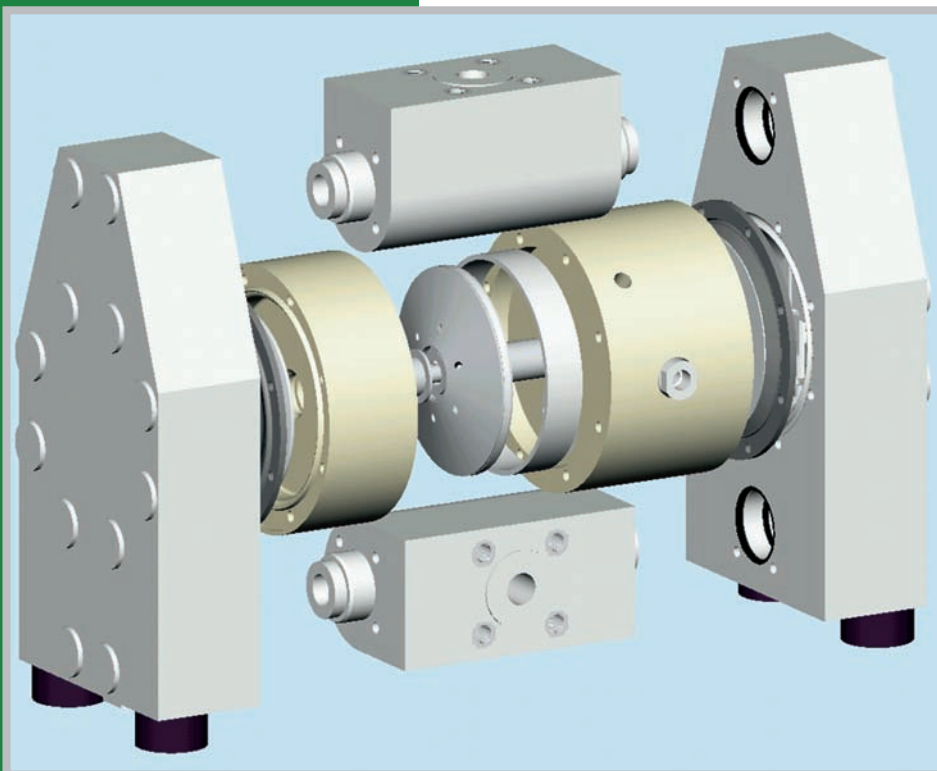


SPARE PART KITS

Spare part kits S for pumps of the AH series are compiled for single-shift operation (8 hours per day). These kits ensure that the correct replacement parts are always available in the required quantities. This helps to avoid production stoppages and ensures that the ALMATEC pumps are always ready for action. Besides, it is cheaper to buy spare parts as a kit than individually.

TECHNICAL DATA

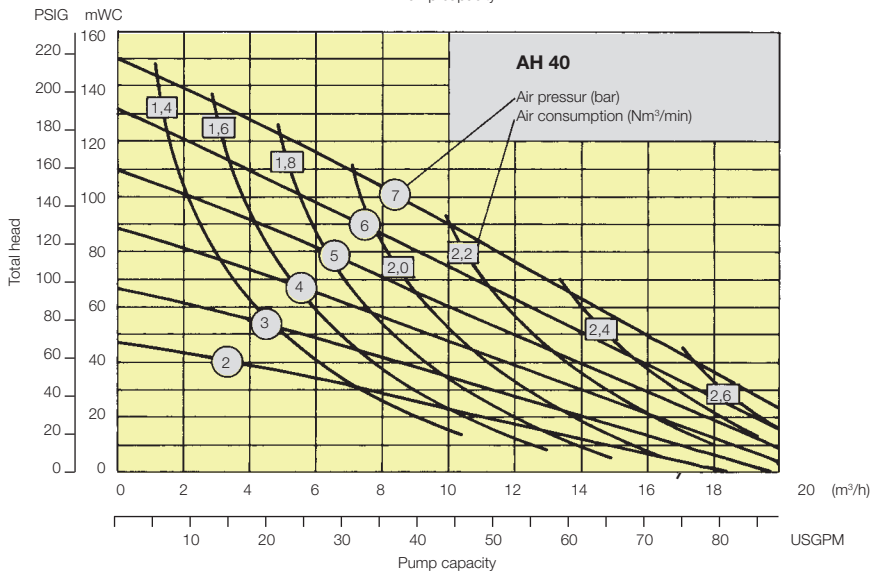
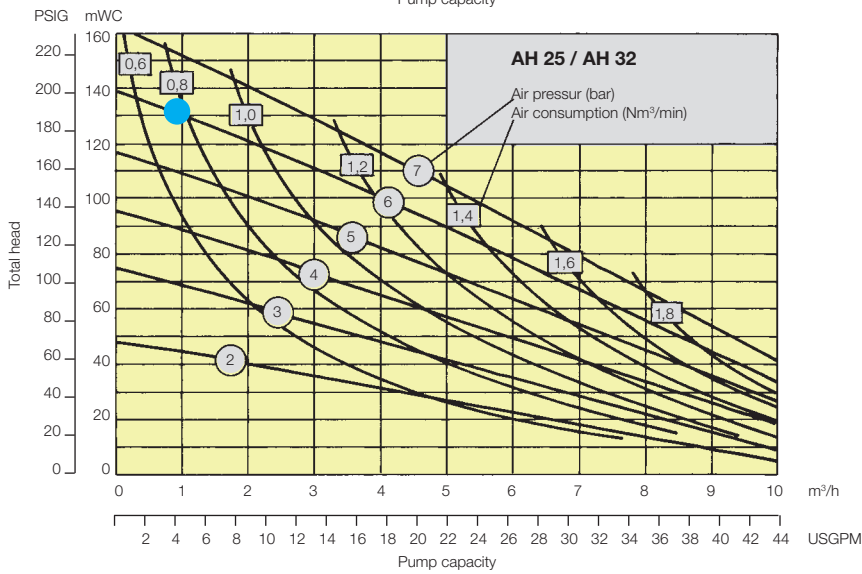
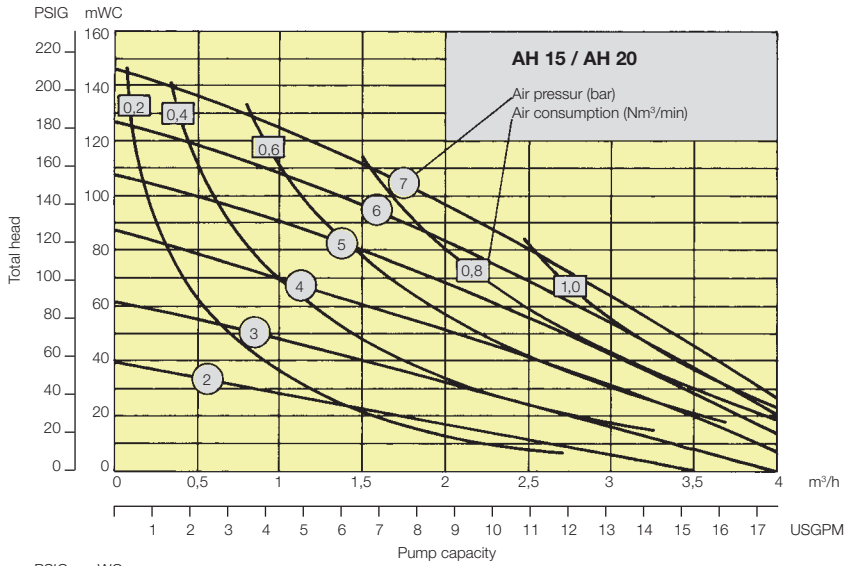
Size	AH 15 E	AH 25 E	AH 40 E	AH 20 S	AH 32 S
Dimensions mm (in.): width	282 (11.1)	382 (15.0)	490 (19.3)	220 (8.7)	324 (12.8)
depth	179 (7.0)	256 (10.1)	296 (11.7)	162 (6.4)	229 (9.0)
height	323 (12.7)	406 (16.0)	539 (21.2)	243 (9.6)	327 (12.9)
Flange connections, DIN or ANSI / *BSP	15 (1/2")	25 (1")	40 (1-1/2")	* 3/4"	* 1 1/4"
Air connection BSP	1/4"	1/2"	1/2"	1/4"	1/2"
Weight kg (lbs)	11 (24)	30 (66)	58 (127)	8.5 (19)	28 (62)
Max. particle size of solids mm (in.)	4 (0.16)	5 (0.20)	8 (0.31)	9 (0.35)	12 (0.47)
Suction lift, dry mWC (ft):					
EPDM/NBR ball valves	2 (6.6)	3 (9.8)	3.5 (11.5)	–	–
PTFE ball valves	1 (3.3)	1.5 (4.9)	2 (6.6)	2 (6.6)	2 (6.6)
Suction lift, wet mWC (ft)	9.5 (31.2)	9.5 (31.2)	9.5 (31.2)	9 (29.5)	9 (29.5)
Max. driving and operating pressure bar (psig)	7 (100)	7 (100)	7 (100)	7 (100)	7 (100)
Max. operating temperature °C (°F)	70 (158)	70 (158)	70 (158)	80 (176)	80 (176)



Example for reading the performance charts on the next page (blue dot at the AH 25 chart):
To transport a quantity of 1 m³/h against 130 mWC (or 13 bar), an operating pressure of 6 bar is needed. The air consumption amounts to 0,8 Nm³/min.

PERFORMANCE RANGE

The following data refer to water at 20°C / 68°F (referring to DIN EN ISO 9906).





The Specialists for Air Operated Diaphragm Pumps

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