

Eccentric Screw Pump as Barrel Emptying Pump

Series AFP

Use

AFP pumps are used for barrel/tank emptying. They deliver low to highly viscous, neutral or corrosive, pure or abrasive liquids, liquids containing gases or which tend to froth including liquids containing fibrous and solid materials.

Principal fields of application

Chemical and petro-chemical industries, the paper and cellulose industries, the soap and fats industry, the paint industry, the food and drinks industry, the plastics industry, the textile industry etc.

Operation

Rotary self-priming positive displacement pump whose pumping elements are formed by the rotating eccentric screw (the rotor) and the fixed stator. In any cross-sectional plane, the elements are in contact with one another at two points, and along the length of the pumping elements these points form two lines of seal. The material contained in the sealed enclosed cavities which are formed as the rotor turns is displaced axially and with complete continuity from the suction to the delivery end of the pump. Despite the fact that the rotor rotates, no turbulence is produced. The constant volume of the enclosed cavities means that there are no pressurizing forces and thus guarantees a low-surge pumping action which is not at all severe on the material being pumped.

Structural design

Pump and drive form a block aggregate. Drive and pressure casing are held together by a quick-set clamping device so that a change of the drive motor is possible within a short period of time without any problems. A separate sealing housing is provided in the pressure casing. Subsequent change-over to other sealing variants is possible.

The drive torque is transmitted to the rotor via a torque rod fixed to the rotor. The bearing of this rotating unit is in the drive. With the elastomer design, the stator is vulcanized into a tube, and with the plastic design, pushed into a suction casing.

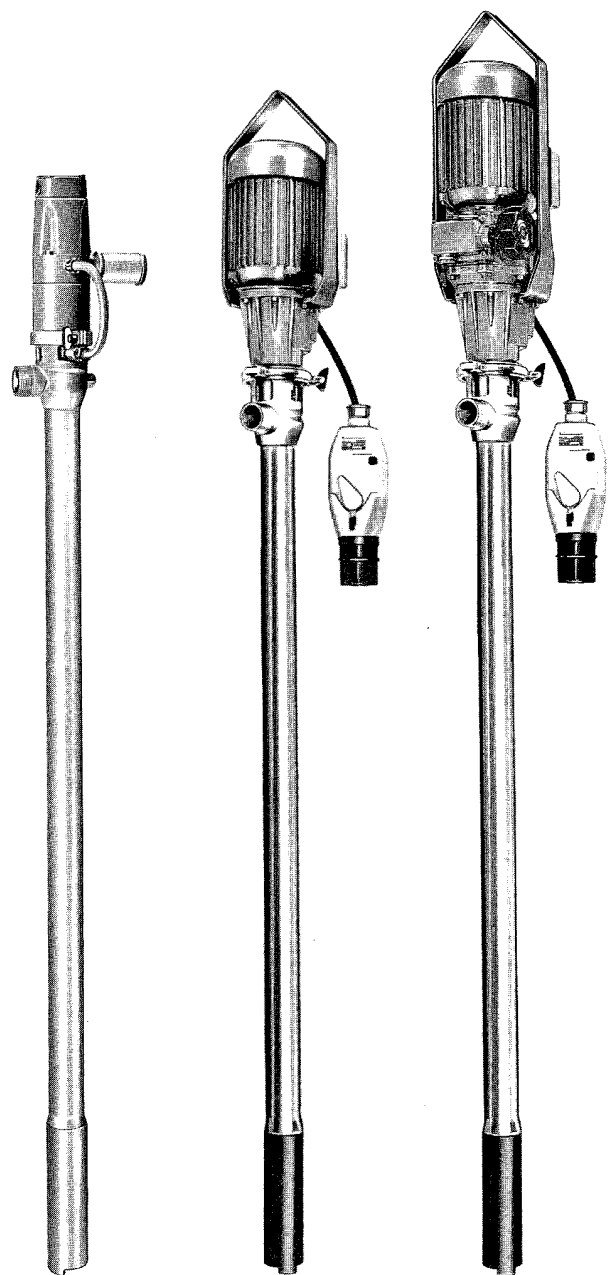
Pressure casing and stator/suction casing are screwed together.

Due to the compact type of construction and the low weight, AFP pumps are handy and can be easily transported.

Shaft seal

By uncooled or cooled (air flow cooling with air motor drive), maintenance-free, non-balanced, single-acting mechanical seal.

The material pairing and the type are adapted to suit the particular operating conditions. For further details, see pages 2, 3, 4, and 7.



AFP with air motor

AFP with geared motor

AFP with variable speed geared motor

Performance data

For the delivery performances, please refer to the individual characteristics on pages 5 and 6.

- Pump:

Delivery	Q see performance charts pages 5 and 6
Temperature of fluid pumped	t up to 45° C ①
Pump delivery pressure	p _d up to 6 bar
Viscosity	ν = 50.000 mm ² /s
Admissible solid content	60% by volume ③
Grain size	up to 2 mm
Fibre length	up to 25 mm
Max. immersion depth	1100 mm
Min. immersion depth	11mm ④
Min. bung-hole diameter	
Pump size 20.1	51 mm
Pump size 25.1	56 mm
Pump delivery branch	
Male thread according to ISO 228	G 1 ¼

- Air motor:

Performance	1, 1 kW⑤
Air consumption depending upon lead	0,4 up 0,9 m ³ /min
Required air pressure	⑦
Compressed-air connection	
Female thread according to DIN 2999	Rp ½

- Geared motor: ⑥

Performance	0,55 kW
Voltage	230 VΔ/400 V Y
Frequency	50 Hz
Enclosure	IP 54
Speeds	176, 281, 446, 550 1/min

- Variable speed geared motor: ⑥

Performance	0,55 kW
Voltage	230 VΔ/400 V Y
Frequency	50 Hz or 380 V Y
Enclosure	IP 54
Speed ranges	38 up to 232 1/min 61 up to 365 1/min 97 up to 581 1/min

- ① Higher temperatures on request.
- ② Depending upon the fluid to be pumped and pump speed.
- ③ Depending upon the kind and size of the solids.
- ④ Residual liquid height if pump rests on the barrel/tank bottom.
- ⑤ At 6 bar air pressure (flow pressure).
- ⑥ Motors for other voltage, frequency, enclosure, speeds on request.
- ⑦ Refer to characteristics pages 5 and 6.

Materials

Pump:

Denomination	Part No.	Material design
Mechanical seal housing	214	1.4571
Rotor	401	1.4571
Stator	402	acrylonitrile-butadiene rubbers (NBR) ① fluoroelastomer (FPM) ① RCH 1000 ① PTFE ①
Delivery casing	504	1.4571
Suction casing ②	505	1.4571/1.4435

Shaft seal:

Denomination	Material key acc. to DIN 24 960	Material design
Slide material pairing	BV	Hard carbon/ ceramics
Auxiliary gaskets	V M	fluoroelastomer (FPM) ① fluoroelastomer (FPM) PTFE- coated ①
Springs and materials	GG	1.4571

① The materials are adapted to the operating conditions.

② Only with RCH 1000 and PTFE stator.

Drive

The following drives can be provided:

- Air motor with integrated planetary gear. This kind of drive is particularly suited for fluids to be pumped/plants which call for explosion protection.

By changing the air volume, the speed of the motor is infinitely variable, load-dependent (delivery, delivery pressure, viscosity).

A partial flow of the exhaust motor air is run into the mechanical seal housing where it is used to cool the mechanical seal.

By closing a valve (filling pistol), pumps driven by an air motor can be hydraulically braked until stopped.

- Geared motor (non-explosion-proof) with attached protective motor plug.
- Variable speed geared motor (non-explosion-proof) with attached protective motor plug.

The following are integrated in the protective motor plug: Motor protection with thermal release with temperature compensation, electronic display of sense of rotation, phase inverter and operating switch.

- Geared motor (explosion-proof) as well as variable-speed drive (explosion-proof) on request.

For further data on the drives, please refer to the performance data.

Installation

AFP pumps are installed vertically. The inlet on the suction side is designed so that the pumps can rest on the barrel/tank bottom.

Design table for pump size 20.1

Drives shaft seal and stator materials.

The listed material numbers (Ident numbers) must be quoted when ordering.

			DRIVE											
			Pump size 20.1											
			Air motor	Three-phase geared motor				Three-phase variable-speed geared motor						
			176 1/min	281 1/min	446 1/min	550 1/min	38 up to 232 1/min	61 up to 365 1/min	97 up to 581 1/min					
Operating voltage	400 VY	Mechanical seal material (according to DIN 24960)	BVMGG	acrylonitrile-butadiene rubbers (NBR)	151 830									
				fluoroelastomer (FPM)	151 831									
				RCH 1000	123 147									
				PTFE	123 148									
			BVMGG	acrylonitrile-butadiene rubbers (NBR)	-									
				fluoroelastomer (FPM)	151 832									
				RCH1000	123 149									
				PTFE	123 150									
			230 VA	Stator material	BVMGG	acrylonitrile-butadiene rubbers (NBR)		151 833	151 839	151 845	151 851	151 857	151 871	151 885
						fluoroelastomer (FPM)		151 834	151 840	151 846	151 852	151 858	151 872	151 886
	RCH1000					124 001	123 175	123 183	124 009	151 859	151 873	151 887		
	PTFE					124 002	123 176	123 184	124 010	151 860	151 874	151 888		
	BVMGG	acrylonitrile-butadiene rubbers (NBR)				-	-	-	-	-	-	-		
		fluoroelastomer (FPM)				151 835	151 841	151 847	151 853	151 861	151 875	151 889		
		RCH1000				124 003	123 177	123 185	124 011	151 862	151 876	151 890		
		PTFE				124 004	123 178	123 186	124 012	151 863	151 877	151 891		
	BVMGG	acrylonitrile-butadiene rubbers (NBR)				151 836	151 842	151 848	151 854	151 864	151 878	151 892		
		fluoroelastomer (FPM)				151 837	151 843	151 849	151 855	151 865	151 879	151 893		
		RCH1000		124 005	123 179	123 187	124 013	151 866	151 880	151 894				
		PTFE		124 006	123 180	123 188	124 014	151 867	151 881	151 895				
BVMGG	acrylonitrile-butadiene rubbers (NBR)		-	-	-	-	-	-	-					
	fluoroelastomer (FPM)		151 838	151 844	151 850	151 856	151 868	151 882	151 896					
	RCH1000		124 007	123 181	123 189	124 015	151 869	151 883	151 897					
	PTFE		124 008	123 182	123 190	124 050	151 870	151 884	151 898					

BVMGG

124 008

Material design see page 2

Material No. (Ident No.)

Design table for pump size 25.1 see page 4

Design table for pump size 25.1

Drives, shaft seal and stator materials.

The listed material numbers (Ident numbers) must be quoted when ordering.

			DRIVE										
			Pump size 25.1										
			Air motor	Three-phase geared motor				Three-phase variable-speed geared motor					
				176 1/min	281 1/min	446 1/min	550 1/min	38 up to 232 1/min	61 up to 365 1/min	97 up to 581 1/min			
Operating voltage	400 VY	Mechanical seal material (according to DIN 24960)	Stator material	BVVGG	acrylonitrile-butadiene rubbers (NBR)	123 191							
					fluoroelastomer (FPM)	123 192							
					RCH 1000	123 193							
					PTFE	123 194							
				BVMGG	acrylonitrile-butadiene rubbers (NBR)	-							
					fluoroelastomer (FPM)	123 195							
					RCH1000	123 196							
					PTFE	123 197							
				BVVGG	acrylonitrile-butadiene rubbers (NBR)		124 016	123 234	123 246	124 028	151 907	151 921	151 935
					fluoroelastomer (FPM)		124 017	123 235	123 247	124 029	151 908	151 922	151 936
			RCH1000		124 018	123 236	123 248	124 030	151 909	151 923	151 937		
			PTFE		124 019	123 237	123 249	124 031	151 910	151 924	151 938		
	BVMGG		acrylonitrile-butadiene rubbers (NBR)		-	-	-	-	-	-	-		
			fluoroelastomer (FPM)		151 899	151 901	151 903	151 905	151 911	151 925	151 939		
			RCH1000		124 020	123 238	123 250	124 032	151 912	151 926	151 940		
			PTFE		124 021	123 239	123 251	124 033	151 913	151 927	151 941		
	BVVGG		acrylonitrile-butadiene rubbers (NBR)		124 022	123 240	123 252	124 034	151 914	151 928	151 942		
			fluoroelastomer (FPM)		124 023	123 241	123 253	124 035	151 915	151 929	151 943		
			RCH1000		124 024	123 242	123 254	124 036	151 916	151 930	151 944		
			PTFE		124 025	123 243	123 255	124 037	151 917	151 931	151 945		
BVMGG	acrylonitrile-butadiene rubbers (NBR)		-	-	-	-	-	-	-				
	fluoroelastomer (FPM)		151 900	151 902	151 904	151 906	151 918	151 932	151 946				
	RCH1000		124 026	123 244	123 256	124 038	151 919	151 933	151 947				
	PTFE		124 027	123 245	123 257	124 049	151 920	151 934	151 948				

BVMGG

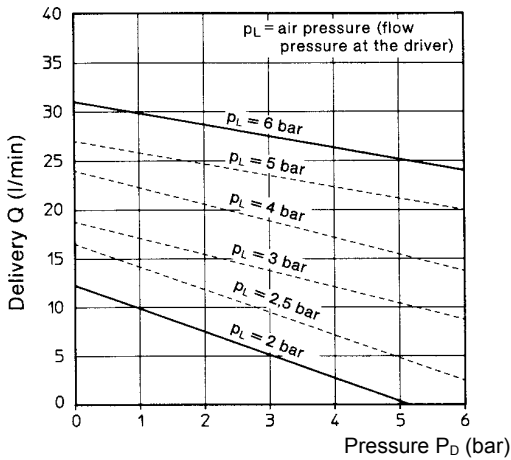
124 027

Material design see page 2

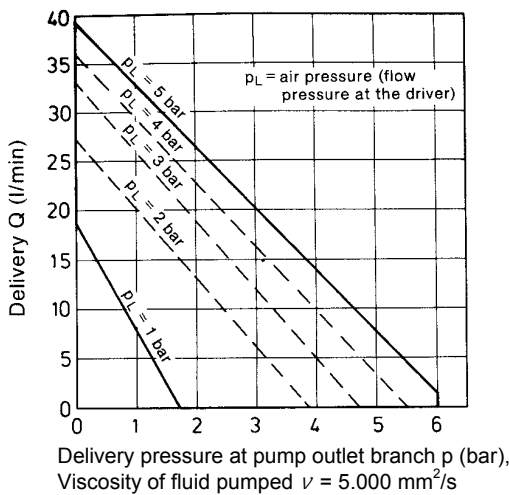
Material No. (Ident No.)

Performance charts, pump size 20.1
 Temperature of the fluid pumped 20°C

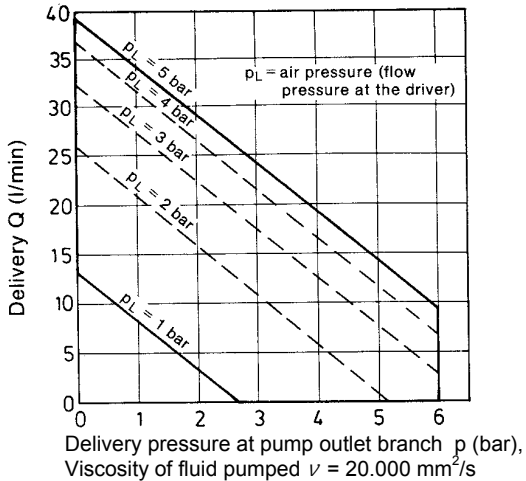
Stator: Elastomers
 Drive : Air motor



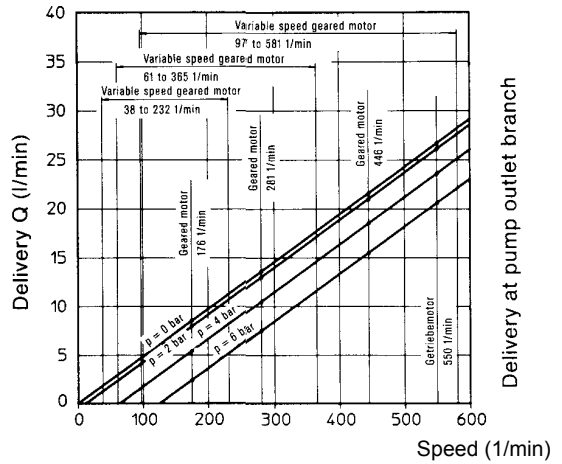
Stator: Plastic material
 Drive: Air motor



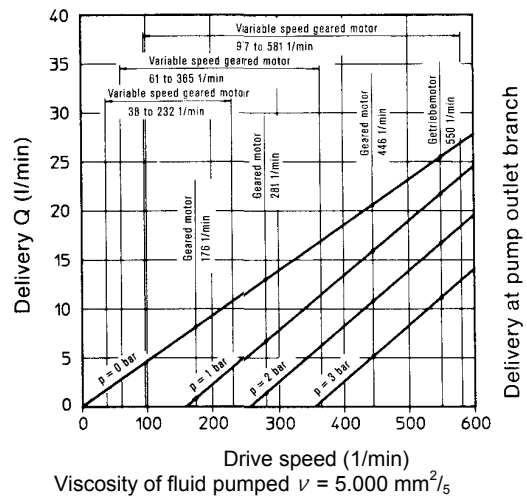
Stator: Plastic material
 Drive: Air motor



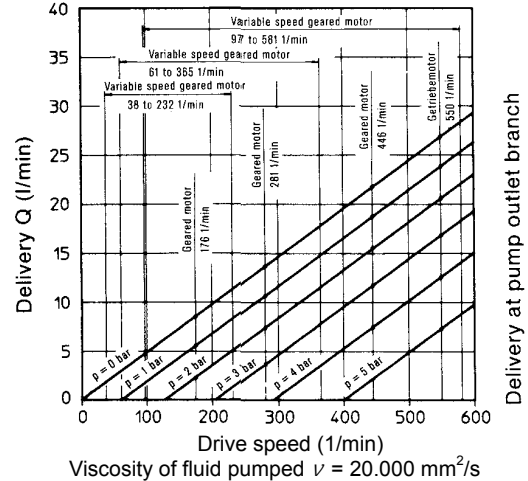
Stator: Elastomers
 Drive: Geared motor, variable speed geared motor



Stator: Plastic material
 Drive: Geared motor, variable speed geared motor

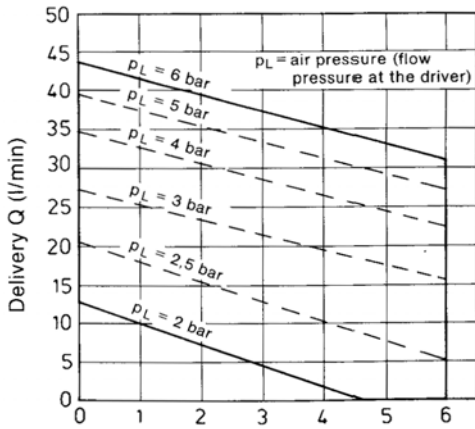


Stator: Plastic material
 Drive: Geared motor, variable speed geared motor



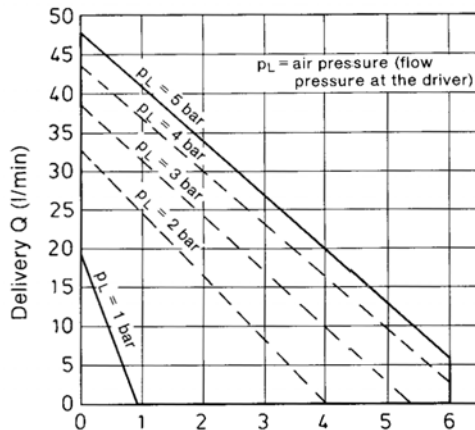
Performance charts, pump size 25.1
 Temperature of the fluid pumped 20°C

Stator: Elastomers
 Drive: Air motor



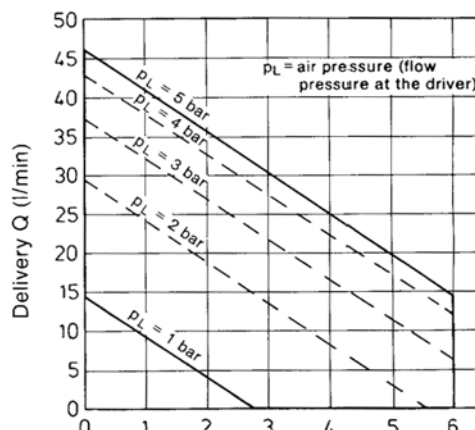
Delivery pressure at pump outlet p (bar)
 when handing water

Stator: Plastic material
 Drive: Air motor



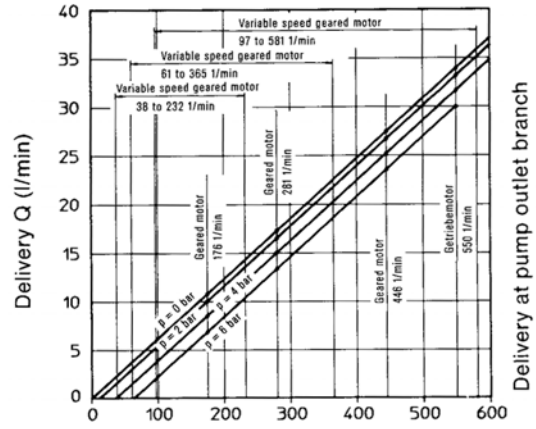
Delivery pressure at pump outlet branch p (bar),
 Viscosity of fluid pumped $\nu = 5.000 \text{ mm}^2/\text{s}$

Stator: Plastic material
 Drive: Air motor



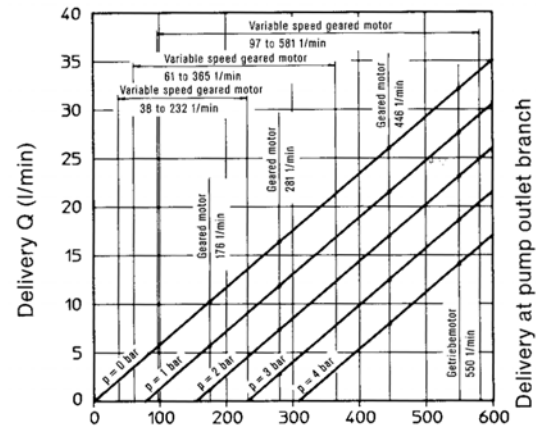
Delivery pressure at pump outlet branch p (bar),
 Viscosity of fluid pumped $\nu = 20.000 \text{ mm}^2/\text{s}$

Stator: Elastomers
 Drive: Geared motor, variable speed geared motor



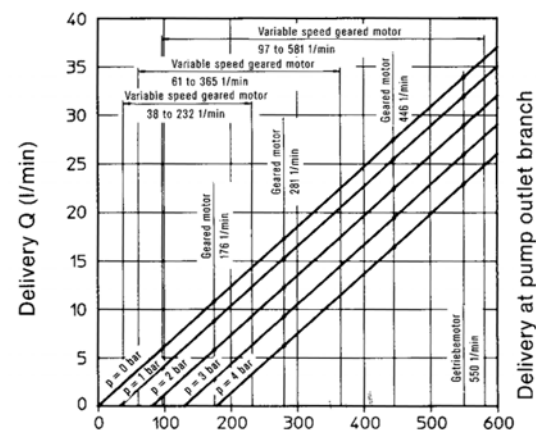
Drive speed (1/min)
 Fluid pumped: Water

Stator: Plastic material
 Drive: Geared motor, variable speed geared motor



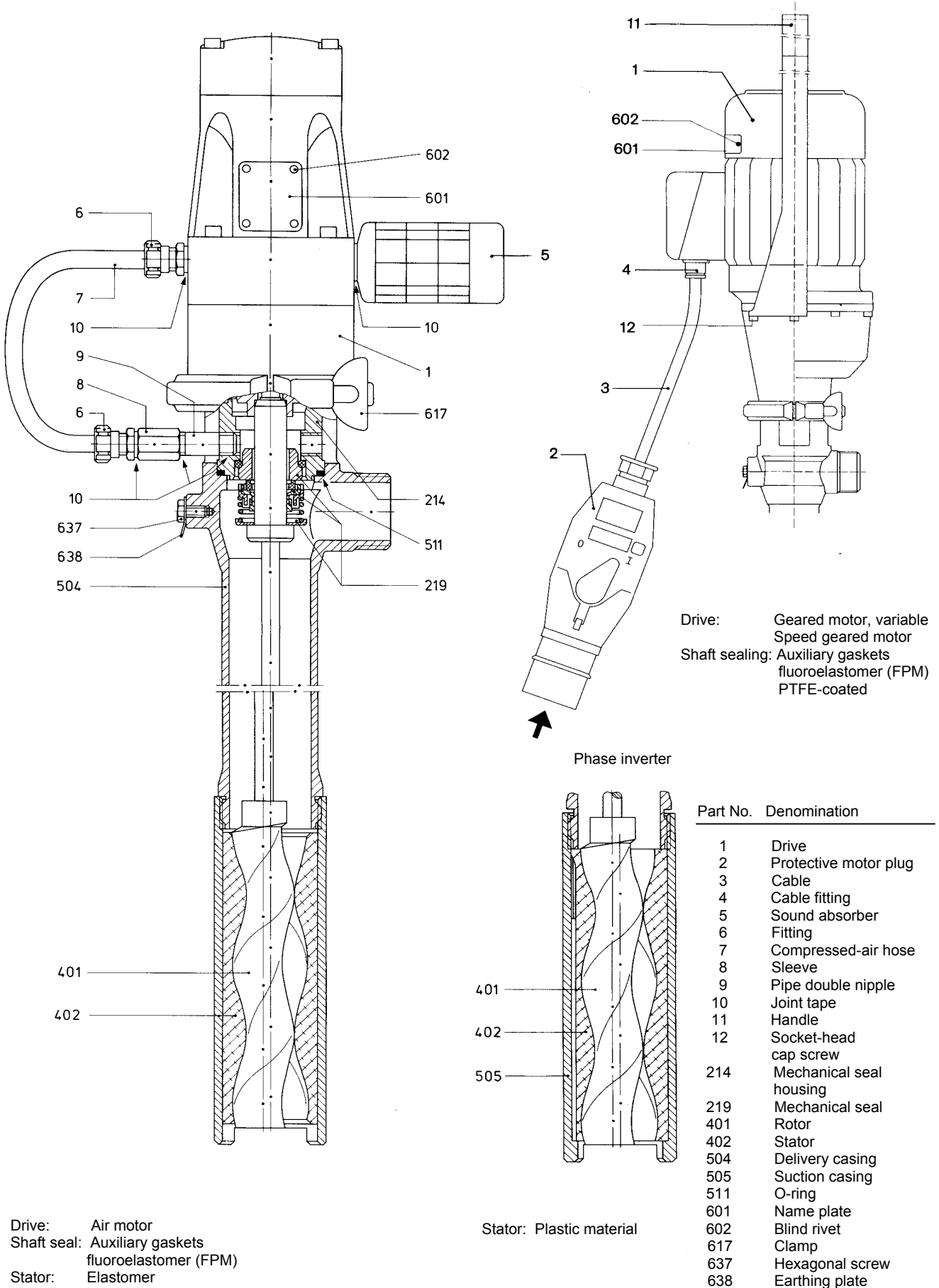
Drive speed (1/min)
 Viscosity of fluid pumped $\nu = 5.000 \text{ mm}^2/\text{s}$

Stator: Plastic material
 Drive: Geared motor, variable speed geared motor



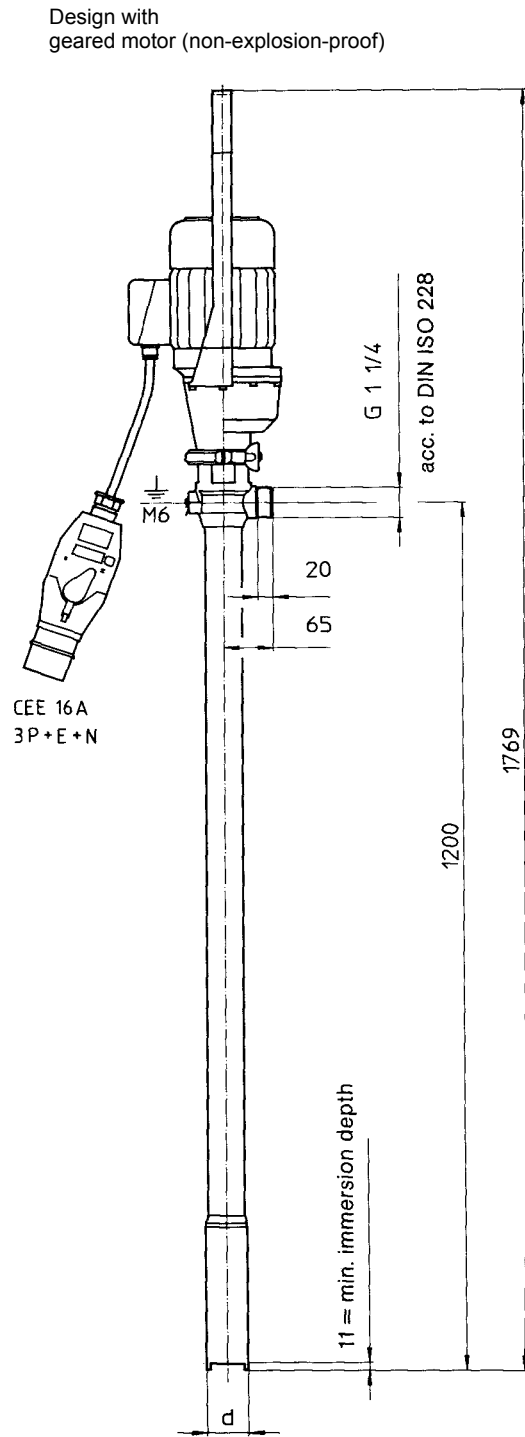
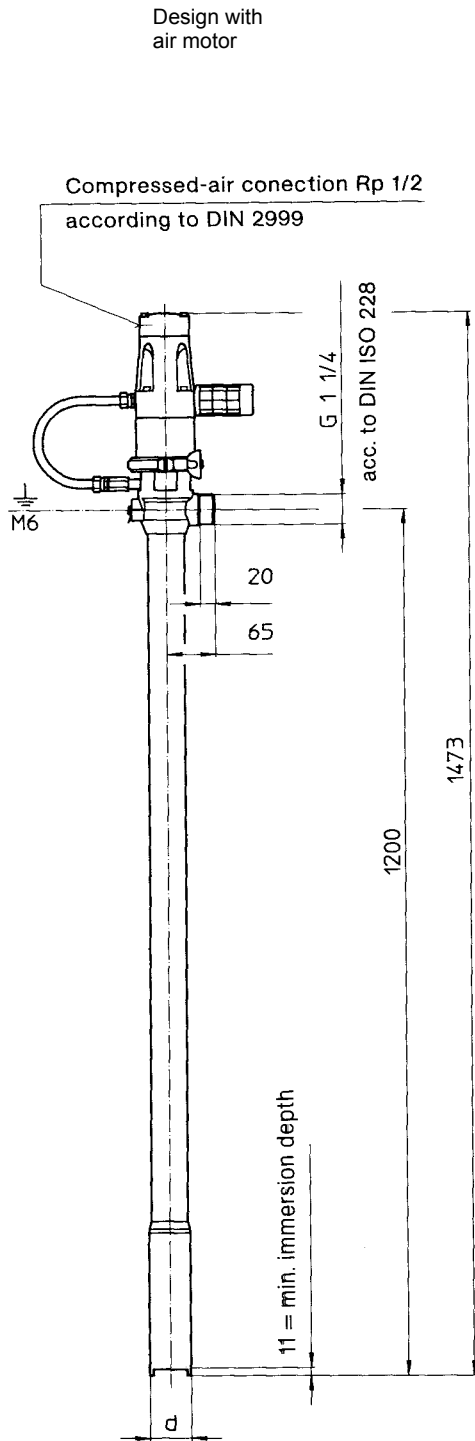
Drive speed (1/min)
 Viscosity of fluid pumped $\nu = 20.000 \text{ mm}^2/\text{s}$

Sectional drawing and parts list



Series AFP

Pump dimensions, weights



Pump size	Diameter d	Weight in case of drive by	
		Air motor approx. kg	Geared motor approx. kg
20.1	50 ± 0,5	9,5	18,4
25.1	55 ± 0,55	10,0	18,9

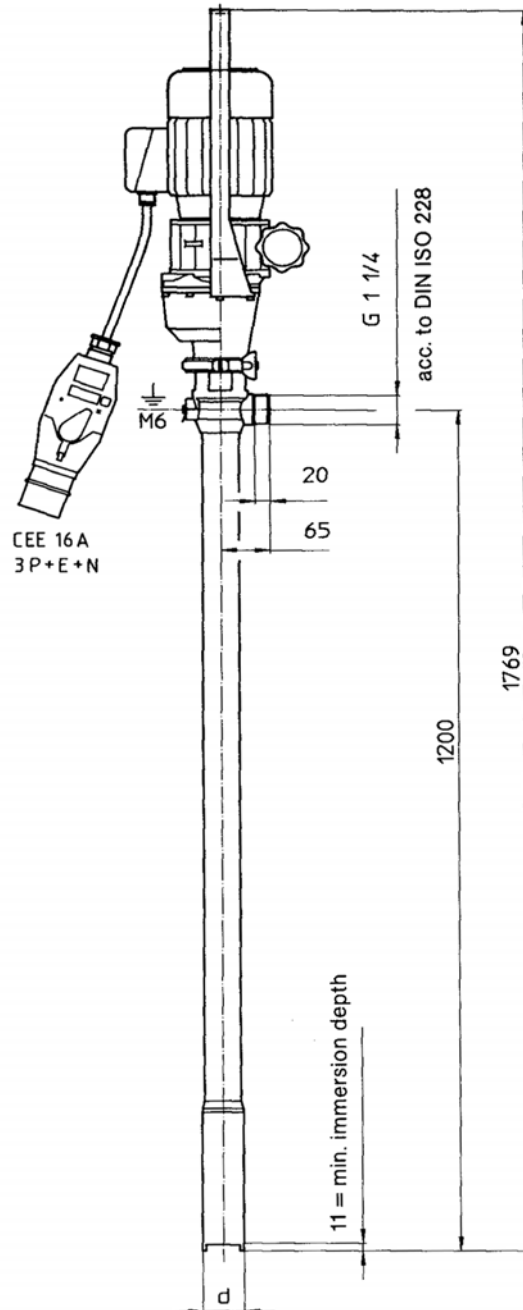
Series AFP

ALLWEILER



Pump dimensions, weights

Design with
variable speed geared motor
(non-explosion-proof)



Pump size	Diameter d	Weight in case of drive by variable speed geared motor approx. kg
20.1	50 ± 0,5	23,4
25.1	55 ± 0,55	23,9

Range of eccentric screw pumps	Series	Number of stages	Maximum output at $\Delta p = 0$ bar		Maximum del. pressure bar	Maximum viscosity mPa·s
			m ³ /h	l/min		
	AE.E-ID	1,2	450	7500	10	300.000
	AE.N-ID	1,2	290	4850	12	270.000
	AEB.E-IE	1,2	174	2900	6	300.000
	AEB.N-IE	1,2	111	1850	12	270.000
	AED.E-ID	1	720	12000	8	250.000
	AED.N-ID	2	450	7500	16	225.000
	AEDB.E-IE	1	258	4300	6	250.000
	AEDB.N-IE	2	174	2900	12	225.000
	AE.N...-RG	1,2,4	21	350	20	1.000.000
	TECFLOW	1	186	3100	4	200.000
	SEZP	1,2	21	350	10	1.000.000
	SHP	2,4	110	1830	24	270.000
	SNZP	1,2	45	750	12	1.000.000
	SNZBP	1,2	45	750	12	1.000.000
	SSP	1,2	48	800	12	150.000
	SSBP	1,2	48	800	12	150.000
	SETP ^①	1,2	140	2350	10	300.000
	SETBP	1,2	40	670	10	150.000
	SEFBP	1	40	670	6	150.000
	SMP	1	40	670	6	150.000
	SMP2	1	5,5	92	6	11.500
	AFP	1	2,8	47	6	50.000
	ANP	2	2,5	42	12	20.000
	ANBP	2	2,5	42	12	20.000
	ASP	2	2,5	42	12	20.000
	ASBP	2	2,5	42	12	20.000
	ADP	3	0,6	10	12	20.000
	ADBP	3	0,6	10	12	20.000
	ACNP	1,2	29	480	12	150.000
	ACNBP	1,2	29	480	12	150.000

^① Special versions for higher pressures available.

Peristaltic range	Series	Maximum output		Maximum del. pressure bar	Maximum viscosity mPa·s
		m ³ /h	l/min		
	ASL	2,4	40	4	100.000
	ASH	60	1000	15	100.000

Macerator range	Series	Maximum throughput m ³ /h	Generated delivery head m
	AM ... S-1	80 at 3 % solids	3
	ABM ... S-1	80 at 3 % solids	3
	AM ... I-1	160 at 3 % solids	-
	ABM ... I-1	80 at 3 % solids	-

Accessories

Pump accessories: Stator setting devices, electrical heaters, bridge breakers.

Drivers: Electric motors, geared motors, variable speed transmissions, reduction gearboxes, internal combustion engines, pneumatic and hydraulic drives.

Transmission components: Couplings, V-belt transmissions, toothed belt transmissions, other types of transmission.

Base plates: Standard and special versions, wheeled trolleys, mounting flanges.

Safety arrangements: Bypass lines with safety or regulating valves, systems to guard against dry running (conductive, capacitive, thermal etc.).

Other accessories: Electrical, hydraulic and pneumatic control arrangements, filter systems, metering equipment, seal liquid and circulating systems for shaft seals, valves, flanges, flexible pipes.

Subject to technical alterations.



ALLWEILER GmbH
Werk Bottrop

Postfach 200123 · 46223 Bottrop
Kirchhellener Ring 77-79 · 46244 Bottrop
Germany

Tel. +49 (0)2045 966-60
Fax +49 (0)2045 966-679
E-Mail: service-ge@allweiler.de
Internet: http://www.allweiler.com

The stated performance data are to be understood only as an outline of performance of our products. For exact limits of application please refer to the quotation and acceptance of order.