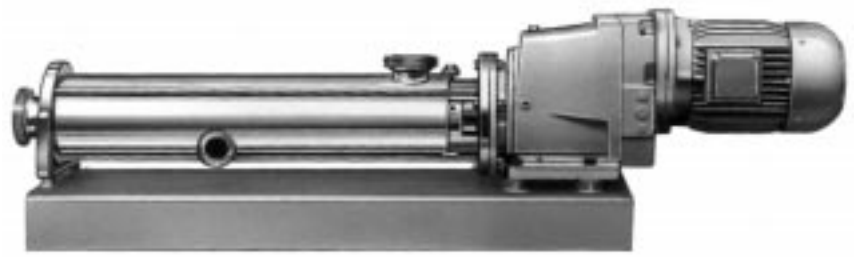
Eccentric block-type screw pumps of CIP design

Available in accordance with US 3-A sanitary standards

Series ACNBP



Adapted to practically used modern cleaning processes – CIP flushings – the ACNBP series provides a pump type which, without being dismantled, can be cleaned by way of through-flushing (during standstill) absolutely free from residues and thus bacteria.

For a pump with open joints to be completely cleaned and drained, it can be temporarily switched in during the flushing process.

If silicone stators with uniform elastomer wall thickness are used, the pump may remain in operation during the whole flushing process.

For the structural design, particular attention was paid to that the liquid pumped flows properly through the entire internal pump chamber. Rest areas without the flow of product which may result in deposits during the pumping process were avoided.

In addition to the corresponding design of the pump interior, all components coming into contact with the liquid such as shaft seals and pin joints are installed and designed so that they are properly cleaned during through-flushing.

Materials and surface quality of the components wetted by the product are adapted to the increased demands for cleanliness.

Thus, the ACNBP series provides pumps meeting all requirements regarding a CIP type according to today's state of the art.

Application
For pumping low to high-viscosity, pure, neutral or aggressive liquids, liquids containing gases or tending to froth, also with fibrous and solids content.

Principal fields of application
Dairies, beverage industry, meat and fish processing, sweets industry, fruit and vegetable processing, other foodstuff industry, pharmaceutical and cosmetics industry.

Operation
Self-priming rotary positive displacement pump whose pumping elements are the rotating eccentric screw (rotor) and the fixed stator. In any cross-sectional plane, the two are in contact with one another at two points, and along the length of the conveying elements, these points form two sealing lines. 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 discharge side of the pump. **Despite the fact that the rotor rotates, no turbulence is produced. The constant chamber volume assures an extremely gentle low-surge pumping action.**

Structural design/type
Discharge casing, stator, suction casing and lantern are held together by corrosion-resistant, easily removable casing connecting screws (tie rods).

For all sizes, the suction/discharge and flushing connections are of particularly large design.

Due to a horizontal clearance-volume-free bottom of the discharge branch, complete draining is possible at this point.

The suction casings and, in case of branch position H, the discharge casing are designed with a flushing/drain connection tangentially arranged at the underside of the casing (other connection arrangements are possible).

The metallic pump components in contact with the liquid are micro-ground, all outer surfaces are polished.

The stator which is vulcanized into a tubular or shell casing (uniform elastomer wall thickness) is provided with external collars vulcanized to both ends which provide a safe seal of the suction and discharge casing thus preventing any corrosion.

The stator shell proper is in principle protected against corrosion from the outside by means of an additional stainless steel shell which can be designed for cooling purposes (special variant).

Via an easily dismountable driver pin, the drive torque is transmitted onto the hollow shaft and from there, via the coupling rod, onto the rotor. The coupling rod terminates at both ends in special pin-type universal joints which can easily be flushed and cleaned. As a special variant, pin-type joint connections are possible which are encapsulated by collars, liquid-tight.

Shaft seal
By means of uncooled, maintenance-free, non-balanced or balanced, single-acting mechanical seal which is supplied with or without quench. O-ring seat for stationary seal ring of the CIP type. Mounting spaces for mechanical seals correspond to DIN 24 960 (short type).

Seal faces and types are adapted to the respective operating conditions.

For further details, see pages 5, 6 and 7.

Advantages: The shaft seals are arranged in the suction chamber so that they are completely flushed by the liquid pumped; therefore, optimum cleaning possibility.

Bearing
The bearing of the drive/hollow shaft is in the reinforced bearings of the geared motors or variable-speed gears which, at the same time, absorb the axial forces occurring.

As all drives are only supplied with reinforced bearings, it is assured that the allocated pumps can always be fully run within their permissible operation limits.

Drive
Non-explosion-proof or explosion-proof geared motors or variable-speed gears can be provided for the drive. For possible types of drives, see pages 10 and 11. For the corresponding technical characteristics and dimensions, see separate information sheet 19-54-0000-025-3.

The fact that the mating dimensions of all types of drives are identical within one pump size is of a material advantage. As a result hereof, subsequent conversion to a different type or size of drive is easily possible.

Technical characteristics
Flow rates, permissible speed ranges and drive powers required can be taken from the performance chart on page 3 or from the separate individual pump characteristics.

Flow rate	Q	l/min	up to	480
Temperature for liquid pumped	t	°C ①	up to	100
Differential pressure				
single-stage, sizes 25 to 550	Δp	bar	up to	6
single-stage, sizes 100 to 380	Δp	bar ②	up to	12
two-stages, size 12 to 380	Δp	bar	up to	12
Pump discharge pressure	p_d	bar ③	up to	12
Suction obtainable	p_s	bar ④	up to	0,95
Viscosity		η mPa·s ④	up to	150.000
Permissible solids content		Vol.% ④	up to	60

The mentioned performance data are to be considered as a product and performance abstract only. The particular operating limits can be taken from the quotation or order acknowledgement.

Permissible particle sizes and fibre lengths:

Pump size	12	25	50	100	200	380	550
max. particle size mm	2	3	3	3,8	5	6,8	6,8
max. fibre length mm	35	42	42	48	60	79	79

Increases in the solids content and particle size require a reduction of the pump speed.

Installation
ACNBP pumps are installed horizontally. If vertical installation is requested, contact the factory.

The special advantages of the ACNBP series at a glance:

- **Pumps of CIP design (CLEANING IN PLACE) with flushing connection.**
- **Open, flushable joints (sleeve encapsulation possible).**
- **Sealing by mechanical seal, with or without quench. The shaft seal is arranged in the suction casing so that it is fully covered by the flow of the liquid pumped/flushing liquid.**
- **Pump completely of stainless steel (including lantern).**
- **Stators of bright foodstuff design (various material qualities) with uniform or non-uniform wall thickness.**
- **When using silicone stators with uniform elastomer wall thickness, the pump may remain in operation during the entire flushing process.**
- **The following is achieved with stators with uniform elastomer wall thickness:**
  - **– lower starting and operating torques,**
  - **– a lower power consumption,**
  - **– smooth operation and a low-pulsation delivery.**
- **Discharge casing designed horizontal at the underside (asymmetrical). The suction casing and, in case of branch position H, the discharge casing with a tangentially arranged flushing/drain connection at the underside of the casing. Thus, perfect emptying of the casings is possible.**
- **Stator covered with stainless steel pipe, thus, heating or cooling is possible at this point.**

① The permissible temperature of the liquid pumped moreover depends on the elastomers used, the kind of the liquid pumped and the attached drives.

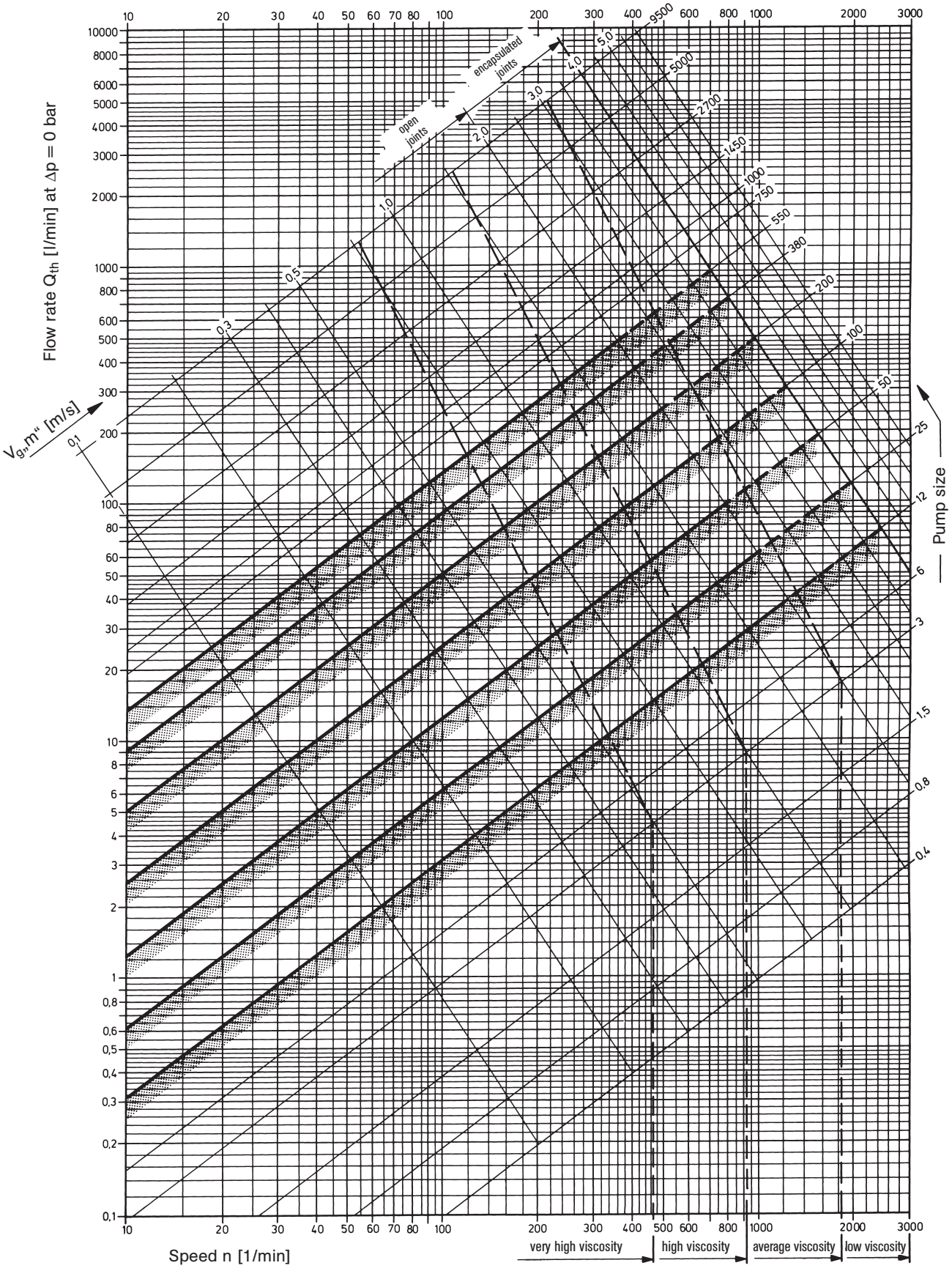
② Stator with uniform elastomer wall thickness.

③ Depending on the sense of rotation and inlet pressure.

④ Depending on the liquid being pumped, pump speed and pump size.

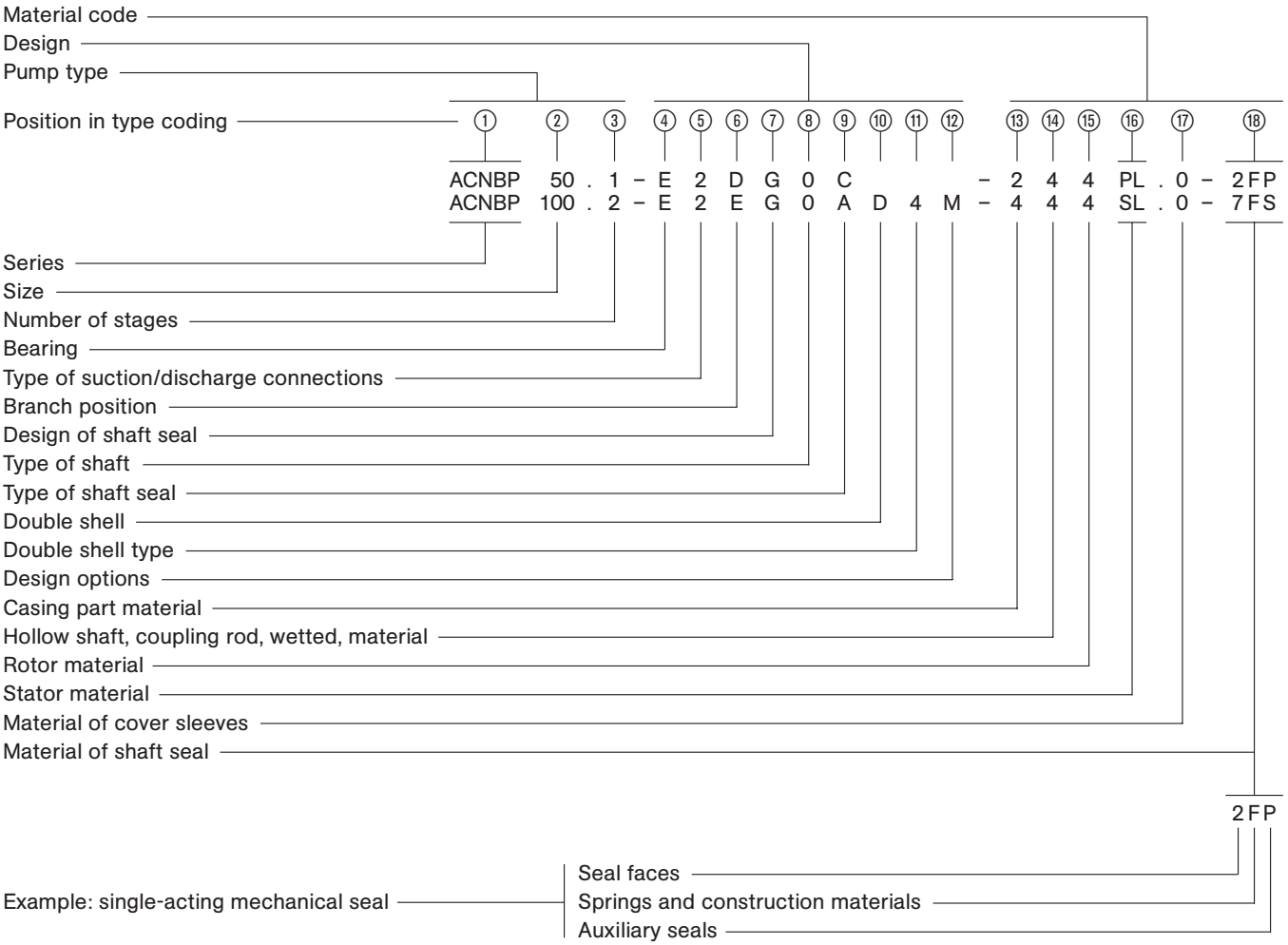
Performance chart

For a rough selection of the pump size and speed as a function of the required flow rate and the nature of the liquid to be pumped. vg„m“ = mean sliding speed of rotor in stator.



Sizes of ACNBP series. Information on performance ranges not covered by the ACNBP series can be found on the back cover of this brochure or in the separate brochures dealing with the other series. For exact performance data, see the individual pump characteristics.

Type coding



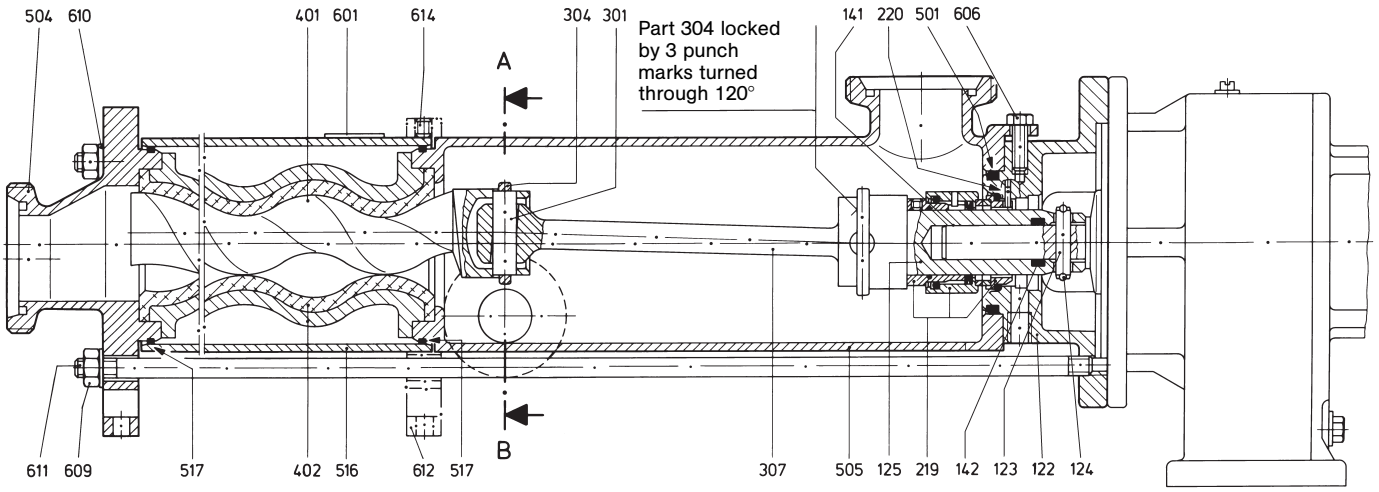
Explanatory notes on the type coding:

Position in type coding	Designation	Design
①	Series	ALLWEILER eccentric screw block-type pump of the CIP design. As a variant of the aseptic design.
②	Size	Possible sizes: 12, 25, 50, 100, 200, 380, 550 The numbers indicate the theoretical flow rate in l/min at n = 400 r.p.m and $\Delta p = 0$ bar
③	Number of stages	1 = single-stage up to 6 bar (up to 12 bar, sizes 100–380 with stator with uniform elastomer wall thickness) (size 12 available only two-stage) 2 = two-stage up to 12 bar (size 550 available only single-stage)
④	Bearing	E = external bearing in the drive aggregate
⑤	Type of suction/ discharge connections	2 = Threaded connection – according to dimensional drawing pages 8 and 9 X = Special-type suction and/or outlet connection, e.g.: Connections for inch system of units such as ISO 2852, IDF standard, ACME 3A, APV-RJT, Mâcon, SMS, Clamp (ISO 2853), Tri-Clamp

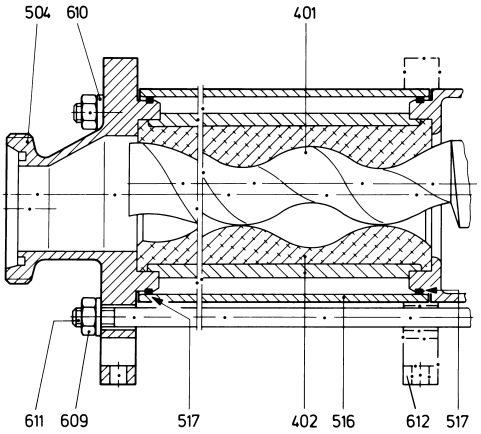
⑥	Branch position	A, B, C, D, E, F, G, H – Arrangement see dreawing on page 10.
⑦	Design of shaft seal	G = Mechanical seal
⑧	Type of shaft	0 = Shaft with wear sleeve
⑨	Type of shaft seal	A = Mechanical seal, single-acting, balanced, direction-independent, spring not in contact with the product, auxiliary seals of elastomer B = as for A, however, with additional quench C = Mechanical seal, single-acting, non-balanced, direction-dependent, single spring, auxiliary seals of elastomer D = as for C, however, with additional quench X = Special-type mechanical seal
⑩	Double shell	D = Double shell for heating or cooling
⑪	Double shell type	4 = Stator (only unpressurized) X = Special type for further double shells
⑫	Design options	Stators with non-uniform elastomer wall thickness (all qualities): N, M, H, T – Rotor with thermal expansion clearance as a function of the temperature of the liquid pumped Stators with uniform elastomer wall thickness (all qualities): D, E, F, R – Rotor with thermal expansion clearance as a function of the temperature of the liquid pumped Y = Rotor ductile hard-chrome plated G = Stator with uniform elastomer wall thickness (possible from size 100) X = Other designs, e. g. encapsulated joints
⑬	Casing part materials	2 = 1.4301 4 = 1.4404 X = Special materials
⑭	Hollow shaft, coupling rod, wetted, material	4 = 1.4571 X = Special materials, e. g. also for joint parts
⑮	Rotor materials	4 = 1.4571 X = Special materials, e. g. other metals, plastics
⑯	Stator materials	PL = Perbunan, light P = Perbunan N YL = Hypalon, light Y = Hypalon SL = Silicone, light X = Special materials, e. g. plastics, elastomers, metals
⑰	Material of cover sleeves (special variant)	PL = Perbunan, light P = Perbunan N YL = Hypalon, light Y = Hypalon O = No cover sleeves, standard CIP joints X = Special materials
⑱	Material of shaft seal	Mechanical seal:

Seal faces	Springs and construction materials	Auxiliary seals
1st figure	2nd figure	3rd figure
1 = Cr cast iron/hard carbon 2 = Cr Mo cast iron/hard carbon 3 = Cr Ni Mo steel armoured/hard carbon 4 = Ceramics/hard carbon 5 = Carbide/carbide highly wear-resistant 6 = Carbide/carbide corrosion-resistant 7 = Carbide/carbide, highly corrosion-resistant X = Special materials	A = 1.4300 F = 1.4571 L = Hastelloy B M = Hastelloy C X = Special materials	P = Perbunan E = EP rubber S = Silicone caoutchouc N = Neoprene V = Viton TTE = EP rubber ① TTV = Viton ① TTS = Silicone rubber ① X = Special materials ① double PTFE-coated

Sectional drawing and parts list

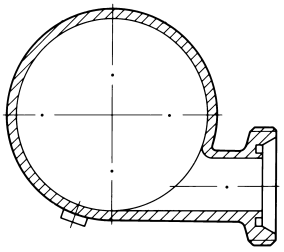


Bearing: **E** (external bearing in the drive unit), hollow shaft at the driver pin easily dismountable
Shaft seal: **G0A** mechanical seal, single-acting, balanced, direction-independent, spring not in contact with the product, O-ring seat for stationary seal ring of the CIP type.
Suitable for all liquids, especially suited for sticky (adhesive) products and products tending to hardening.
Permitted pressure at the shaft seal p = −0.5 to 12 bar.
Joints: open, product-lubricated.
Stator: with uniform elastomer wall thickness.
(Sizes 100 to 380)



Stator: with non-uniform elastomer wall thickness.
(Sizes 12 to 550)

Section A–B, Part 505



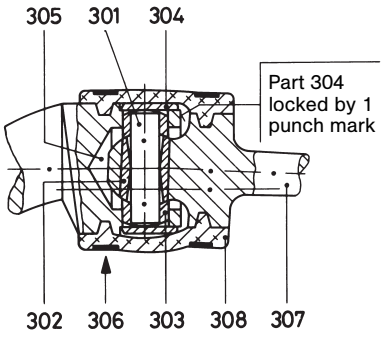
Branch position E:
Suction branch vertically upwards, flushing connection tangentially to the right
(as seen from the drive)

Part No.	Designation
122	Lantern
123	Driver pin
124	Locking device for driver pin
125	Hollow shaft
141	Lubricating paste
142	O-ring
219	Mechanical seal
220	Locking pin
232	Lip seal
301	Coupling rod pin
302 ①	Coupling rod bush
303	Guide bush

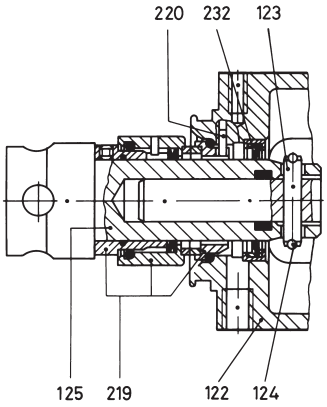
Part No.	Designation
304	Retaining sleeve
305	Joint grease
306	Clamping band
307	Coupling rod
308	Cover sleeve
401	Rotor
402	Stator
501	O-ring
504	Discharge casing
505	Suction casing
516	Stator shell
517	O-ring

Part No.	Designation
601	Name plate
606	Hexagon screw
609	Hexagon nut
610	Washer
611	Tie rod
612	Support, pump-side Support, drive-side
614	Grub screw

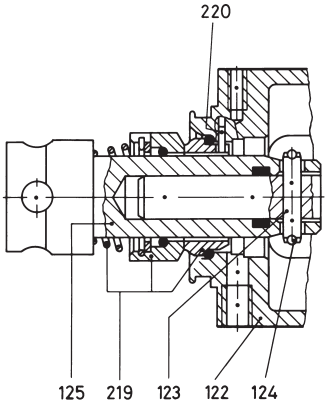
① Not required for pump size 12



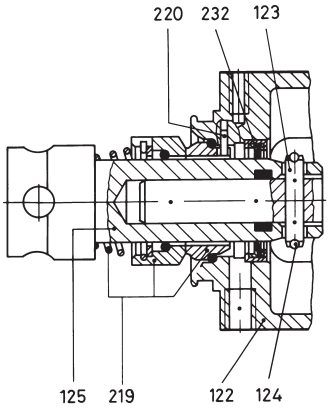
Joints: encapsulated liquid-tight,
lubricated for life
(special variant).



Shaft seal: **G0B** as **G0A**, however,
with additional quench.
Max. permitted pressure difference
between quench liquid pressure
and pressure in the pump casing
p = 0,5 bar. Max. quench
liquid pressure 3 bar.

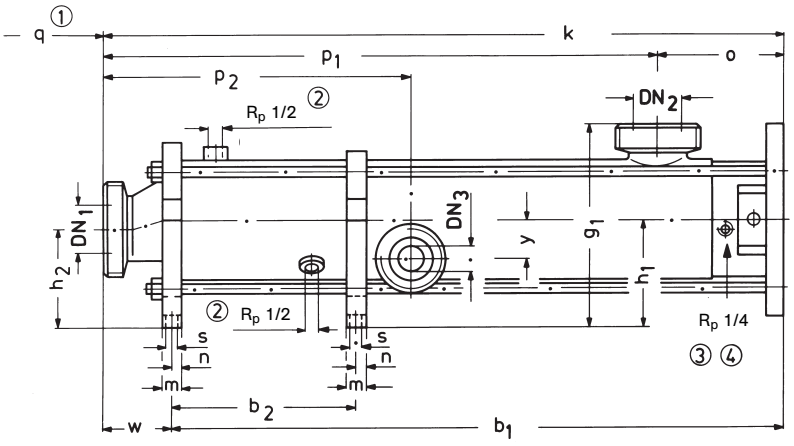


Shaft seal: **G0C** Mechanical seal, single-acting,
non-balanced, direction-dependent,
single spring, O-ring seat for
stationary seal ring of the CIP type.
Suited for all liquids.
Permitted pressure at the shaft seal
p = −0,5 to 10 bar.

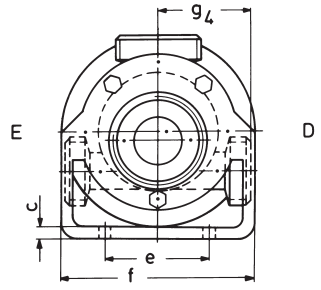


Shaft seal: **G0D** as **G0C**, however,
with additional quench.
Max. permitted pressure difference
between quench liquid pressure
and pressure in the pump casing
p = 0.5 bar. Max. quench
liquid pressure 3 bar.

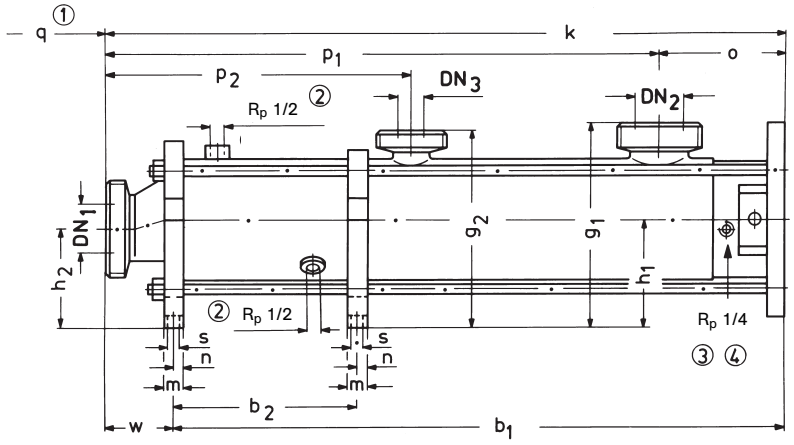
Pump dimensions, possible branch positions, weights



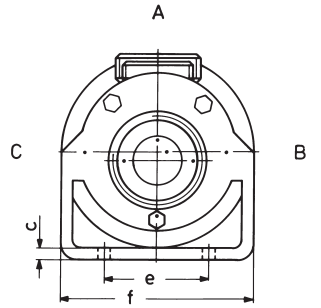
Pump dimensions for shaft seal design: **G0A, G0B, G0C, G0D**



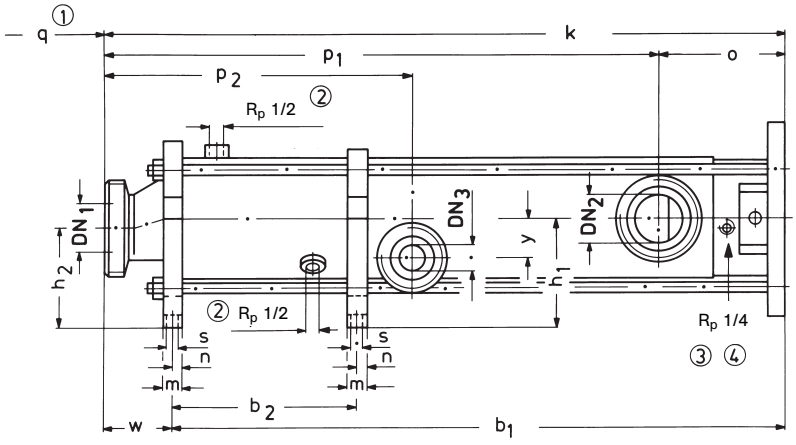
Branch position E or D
Casing **not** rotatable



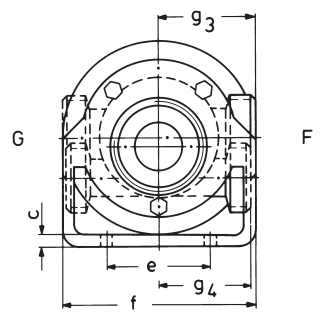
Pump dimensions for shaft seal design: **G0A, G0B, G0C, G0D**



Branch position A, B or C
Casing rotatable

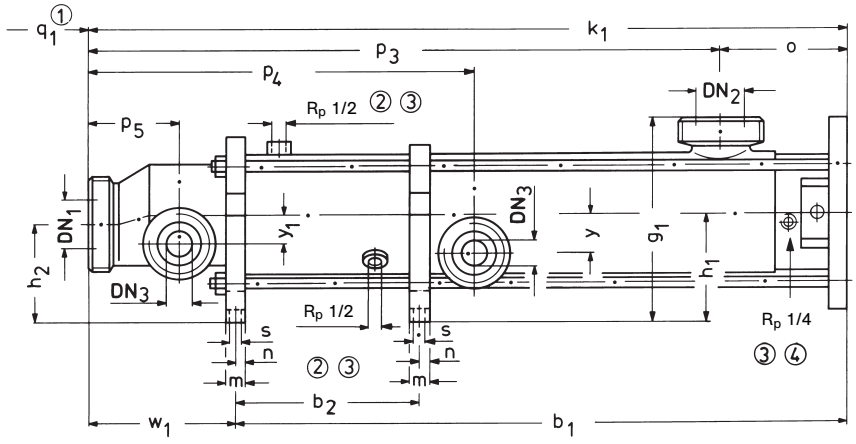


Pump dimensions for shaft seal design: **G0A, G0B, G0C, G0D**

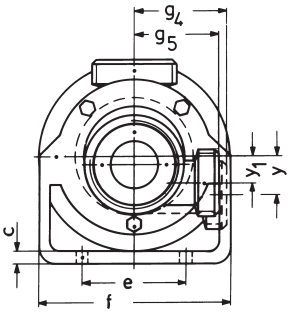


Branch position F or G
Casing **not** rotatable

Pump dimensions, possible branch positions, weights



Pump dimensions for shaft seal design: **G0A, G0B, G0C, G0D**



Branch position H
Casing **not** rotatable

Dimensions in mm,
pitch of round threads in inches.
Subject to alterations without prior notice.

Sense of rotation: Counterclockwise looking from the drive end is standard, in which case DN_1 = discharge connection, DN_2 = suction connection, DN_3 = flushing connection. Changes of sense of rotation possible, in which case DN_1 = suction connection, DN_2 = discharge connection

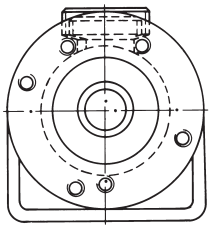
Size	Pump dimensions																		
	b_1	b_2	c	e	f	g_1	g_2	g_3	g_4	g_5	h_1	h_2	k	k_1	m	n	o	p_1	p_2
12.2	487,5	–	10	70	133	146	142	61	62	62	85	82	530,5	571,5	20	10	88	442,5	296
25.1	479	–	10	80	143	158	157	68	72	72	90	84	534	574	20	10	91	443	238
25.2	605	–	10	80	143	158	157	68	72	72	90	84	660	700	20	10	91	569	364
50.1	577	–	10	95	157	176	173	81	82	72	95	87	640	690	20	10	108	532	286
50.2	737	–	10	95	157	176	173	81	82	72	95	87	800	850	20	10	108	692	446
100.1	701	–	10	140	198	192	186	97	92	92	95	87,5	764	819	20	10	123	641	334
100.2	901	–	10	140	198	192	186	97	92	92	95	87,5	964	1019	20	10	123	841	534
200.1	856	–	10	170	233	220	218	107	110	88	113	103,5	929	1023	25	12,5	137	792	409
200.2	1108	–	10	170	233	220	218	107	110	88	113	103,5	1181	1275	25	12,5	137	1044	661
380.1	1022	331	10	180	245	241	229	117	110	100	124	111,5	1111	1203	25	12,5	159	952	486
380.2	1328	637	10	180	245	241	229	117	110	100	124	111,5	1417	1510	25	12,5	159	1258	792
550.1	1176	485	10	180	245	241	229	117	110	100	124	111,5	1265	1358	25	12,5	159	1106	640

Size	Pump dimensions										Suction/pressure connection		Flushing connection		Weight
	p_3	p_4	p_5	q ①	q_1 ①	s	w	w_1	y	y_1	DN_1 DN_2	Threaded connection acc. to DIN 11 887-A	DN_3	Threaded connection acc. to DIN 11 887-A	approx. ca. kg
12.2	483,5	337	43	170	130	11	43	84	23	9	32	Rd 58 x 1/6	20	Rd 44 x 1/6	
25.1	483	278	50	230	190	11	55	95	27,5	12	40	Rd 65 x 1/6	25	Rd 52 x 1/6	
25.2	609	404	50	230	190	11	55	95	27,5	12	40	Rd 65 x 1/6	25	Rd 52 x 1/6	
50.1	582	336	58	290	240	11	63	113	34	17	50	Rd 78 x 1/6	32	Rd 58 x 1/6	
50.2	742	496	58	290	240	11	63	113	34	17	50	Rd 78 x 1/6	32	Rd 58 x 1/6	
100.1	696	389	58	370	320	11	63	118	43,5	21,5	65	Rd 95 x 1/6	40	Rd 65 x 1/6	
100.2	896	589	58	370	320	11	63	118	43,5	21,5	65	Rd 95 x 1/6	40	Rd 65 x 1/6	
200.1	886	503	99	450	360	14	73	167	50	26	80	Rd 110 x 1/4	50	Rd 78 x 1/6	
200.2	1138	755	99	450	360	14	73	167	50	26	80	Rd 110 x 1/4	50	Rd 78 x 1/6	
380.1	1045	579	114	540	450	14	89	182	50	37,5	100	Rd 130 x 1/4	50	Rd 78 x 1/6	
380.2	1351	885	114	540	450	14	89	182	50	37,5	100	Rd 130 x 1/4	50	Rd 78 x 1/6	
550.1	1199	733	114	540	450	14	89	182	50	37,5	100	Rd 130 x 1/4	50	Rd 78 x 1/6	

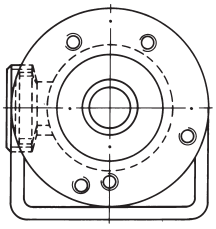
① Stator/suction casing dismantling dimension
② Only with double shell design
③ Cylindrical female thread according to DIN 2999
④ Two identical connections, opposite

Possible branch arrangements as seen from the drive
Casing rotatable

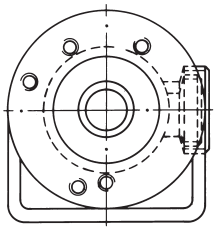
Design A



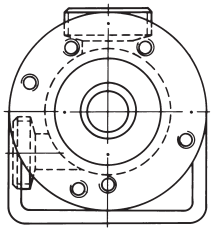
Design B



Design C

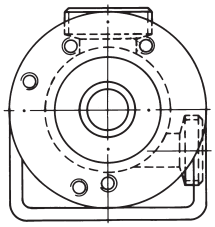


Design D

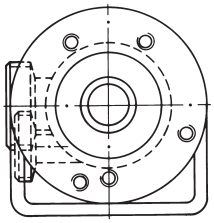


Possible branch arrangements as seen from the drive
Casing **not** rotatable

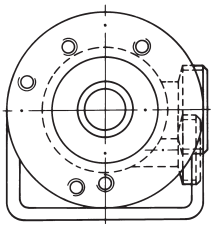
Design E



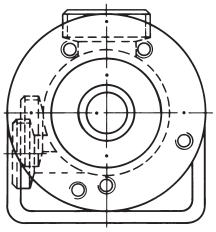
Design F



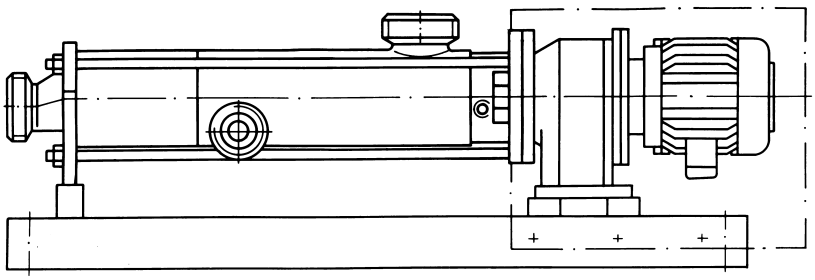
Design G



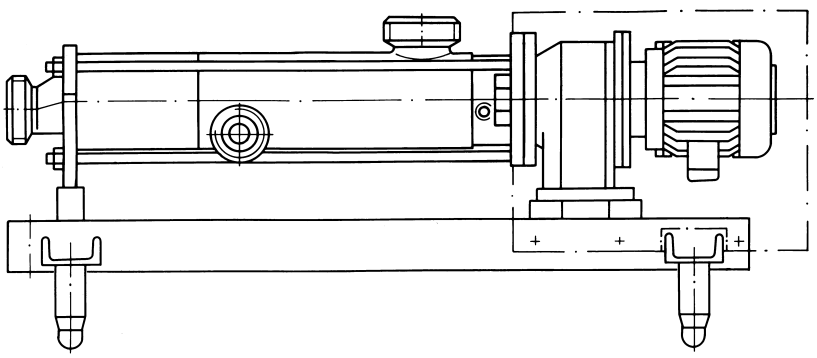
Design H



Drive/installation possibilities

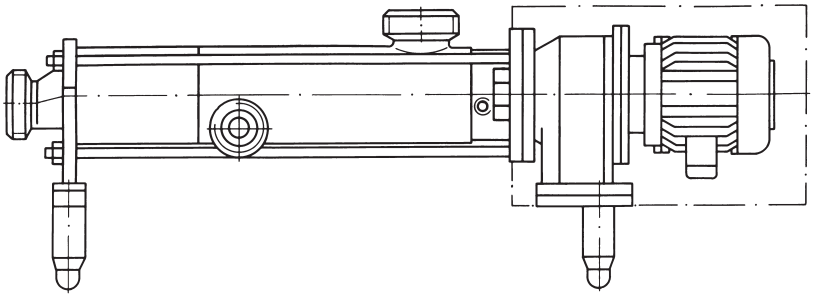


1. ACNBP with geared motor and base plate
   (cover hood to the drive at extra price).

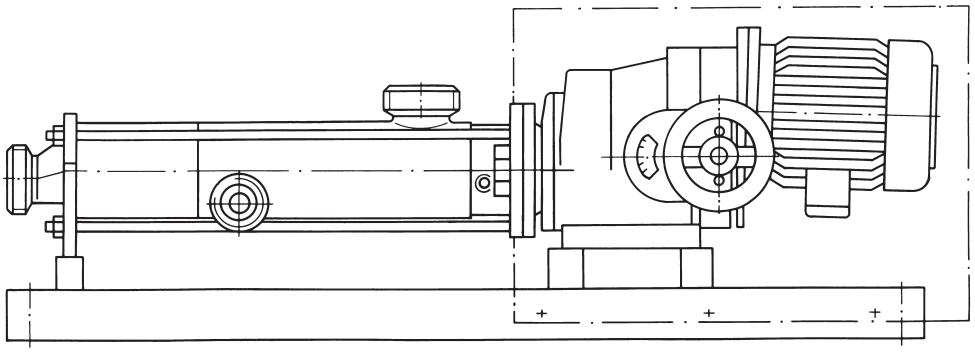


2. ACNBP with geared motor, base plate with concave feet
   (cover hood to the drive at extra price).

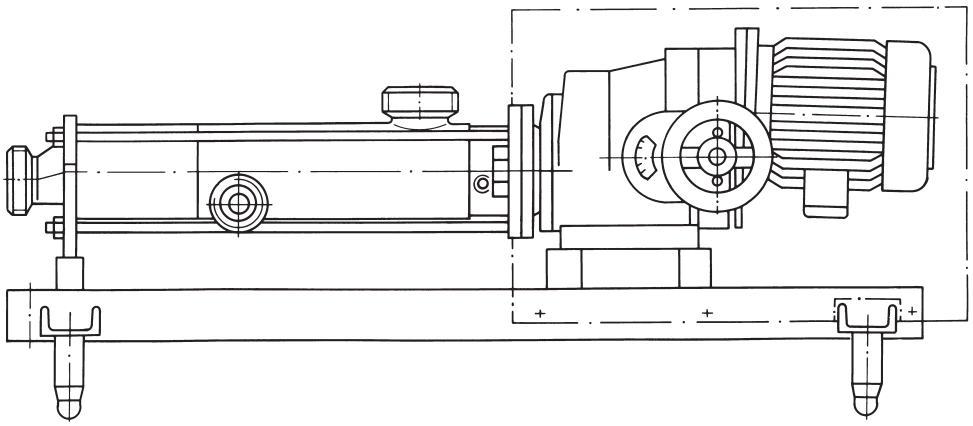
Drive/installation possibilities



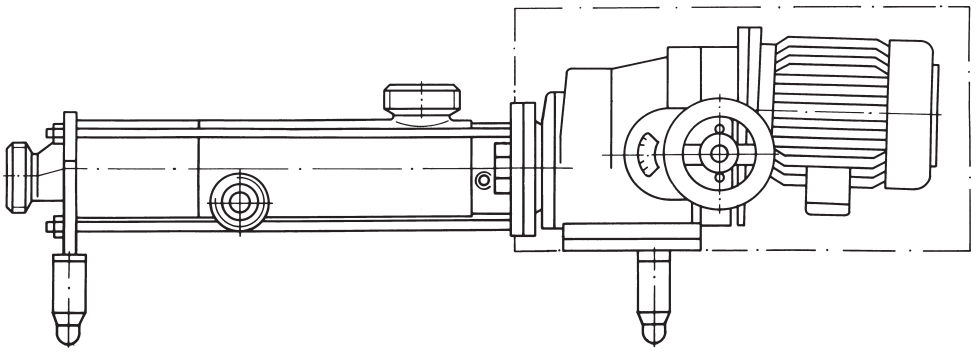
3. ACNBP with geared motor and concave feet
   (cover hood to the drive at extra price).



4. ACNBP with infinitely variable-speed gear and base plate
   (cover hood to the drive at extra price).



5. ACNBP with infinitely variable-speed gear, base plate with concave feet
   (cover hood to the drive at extra price).



6. ACNBP with infinitely variable-speed gear and concave feet
   (cover hood to the drive at extra price).

Other drives are possible.
Branch arrangement D was graphically represented, other branch arrangements are possible, refer to page 10.

Range of eccentric screw pumps

Series	Number of stages	Maximum output at $\Delta p = 0$ bar		Maximum del. pressure	Maximum viscosity
		m^3/h	l/min	bar	mPa·s
AE.E-ID	1,2	450	7500	10	300.000
AE.N-ID	1,2	290	4850	16	270.000
AE.H-ID	2,4	174	2900	24	270.000
AEB.E-IE	1,2	174	2900	6	300.000
AEB.N-IE	1,2	111	1850	12	270.000
AEB4H-IE	4	12	200	24	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	30	500	20	1.000.000
TECFLOW	1	186	3100	4	200.000
SEZP	1,2	21	350	10	1.000.000
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	Maximum viscosity
	m^3/h	l/min	bar	mPa·s
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

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