

Eccentric Screw Pumps

Series ANP



Applications

For pumping neutral or corrosive liquids, uncontaminated or abrasive liquids, liquids containing gases or which tend to froth, and liquids of high or low viscosity, including liquids containing fibrous and solid material.

Principal fields of application

Waste water and waste water treatment engineering, the chemical and petrochemical industries, the paper and cellulose industries, the soap and fats industry, the paint industry, the food and drinks industry, the plastics industry, ceramics, agriculture, the sugar industry, shipbuilding etc.

Operation

Rotary self-priming, positive-displacement pumps whose pumping elements are formed by a rotating eccentric screw (the rotor) and a fixed stator. In any cross-sectional plane, the elements are in contact with one another at two points and along the length of the 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 pressurising forces and thus guarantees a low-surge pumping action which is not at all severe on the material being pumped.

Design features

The outlet section, stator, suction casing and bearing housing are held together by external tie-rods. In all sizes the suction casing is designed to have a particularly large flow section. The stator, which is vulcanised into a tubular casing is provided at both ends with external collars vulcanised to it. These provide a safe seal from the suction casing and outlet section and also protect the stator casing against corrosion.

Between the suction casing and bearing housing is situated an interchangeable housing for a stuffing box or mechanical seal (pumps can be converted retrospectively to a different type of seal).

The drive shaft is carried in bearings in the bearing housing. The drive torque is transmitted to the rotor via the drive shaft and a coupling rod. The coupling rod terminates at both ends in universal joints which are encapsulated to form a liquid-tight seal. These pin-type universal joints are of particularly simple and rugged design and are able to withstand the eccentric movement of the rotor without any difficulty.

Shaft seals/Shaft wear sleeves

Shafts are sealed by cooled or uncooled stuffing boxes or cooled or uncooled, non-balanced single or double-acting mechanical seals which require no maintenance.

The type of seal and the material pairings are adapted to suit the particular operating conditions which exist in any given case. For further details see page 5.

In any given size of pump, the housings for the various types of stuffing box or mechanical seal are interchangeable with one another. The various parts of the housings for mechanical seals form a modular system and can be combined with one another without any difficulty should the pump be converted to a different type of mechanical seal.

Mechanical seals to DIN 24 960 can be fitted.

For further details see pages 4, 5, 6 and 7.

Bearings

The drive shaft is carried in particularly rugged deep groove ball bearings which are designed to withstand all appearing radial and axial loads. The bearings are lubricated for life.

For further details see page 4 and 6.

Replaceability of parts

The components for all our eccentric screw pumps are produced to a modular system. It is thus simple and inexpensive to maintain a stock of spares even where pumps of different designs belonging to different series are used in one and the same installation.

Drivers

For possible types of drive see page 9.

Drivers produced by any manufacturer can be used. Technical characteristics and dimensions should be taken from the documentation issued by the manufacturer.

Installation

ANP pumps can be installed horizontally or vertically. The manufacturers should be consulted where vertical installation with the drive down is proposed.

The pump and driver are connected together via a flexible coupling or an intermediate transmission (generally a belt drive) and are mounted on a common baseplate. Dimensions of assemblies available on request.

Technical characteristics

The output, permitted speed range and drive power required can be taken from the selection chart on page 3 or from the individual pump characteristics.

Flow rate	Q l/min	up to	42
Temperature of liquid pumped	t °C ①	up to	150
Differential pressure two-stage	Δp bar	up to	12
Pump discharge pressure	p _d bar ②	up to	16
Suction obtainable	p _s bar ③	up to	0.95
Viscosity	η mPa · s ③	up to	20.000
Permissible solids content	Vol% ③	up to	60

- ① Depending on the liquid pumped and the elastomers used.
- ② Depending on the sense of rotation and inlet pressure.
- ③ Depending on liquid being pumped, pump speed and pump size.

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.

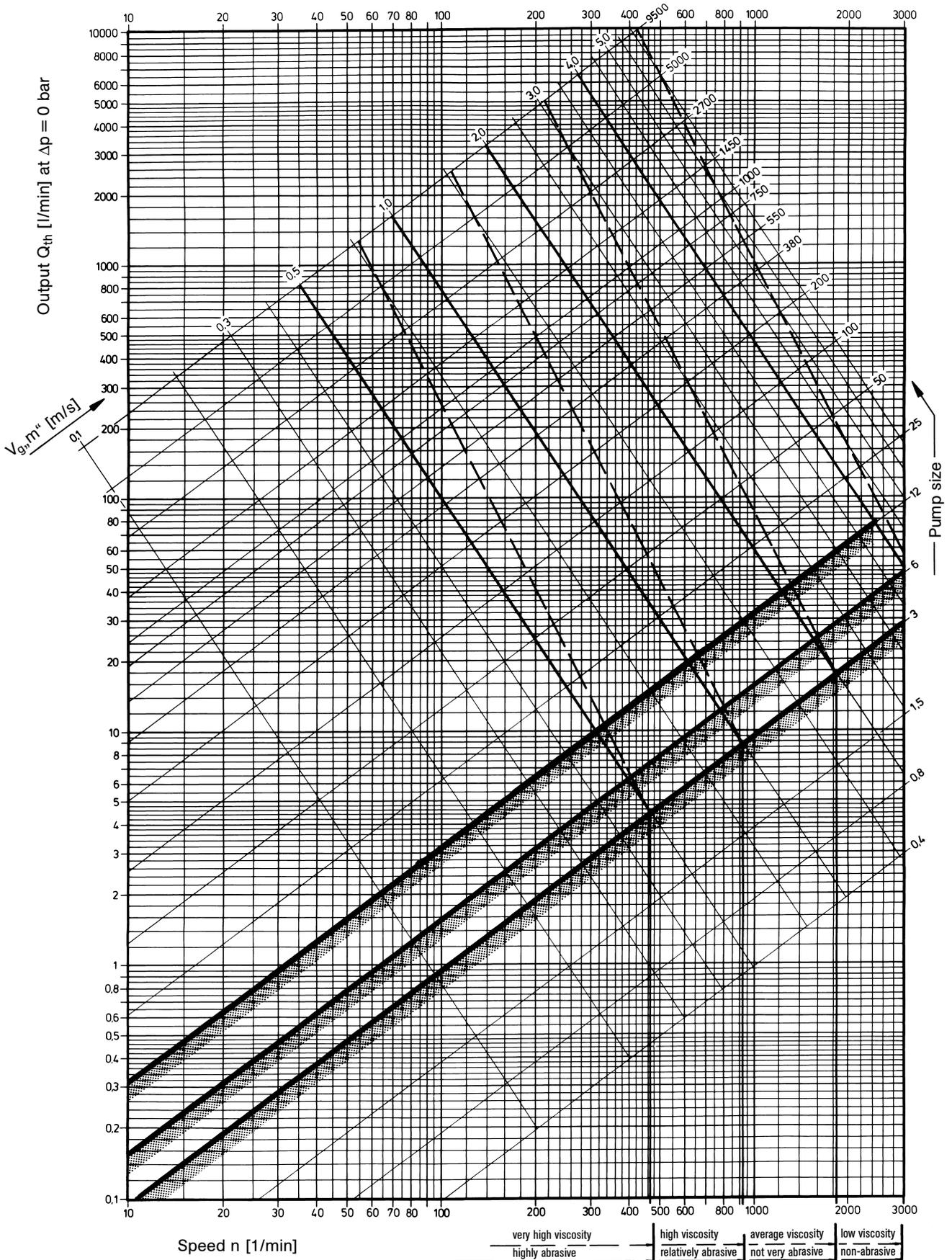
Maximum permitted grain sizes and fibre lengths

Pump size	3	6	12
Max. grain size in mm	1	1.5	2
Max. fibre length in mm	35	35	35

Increases in solid content and grain size mean that the speed of the pump must be reduced.

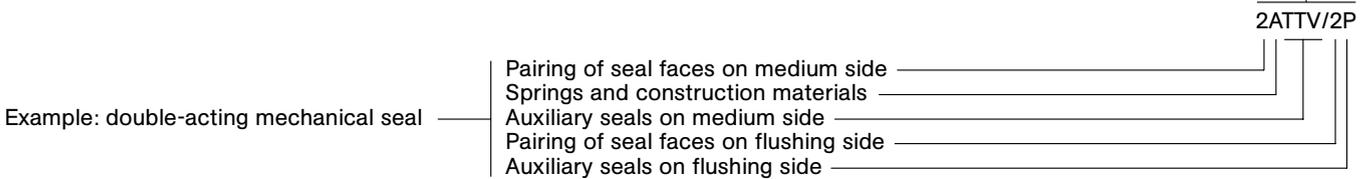
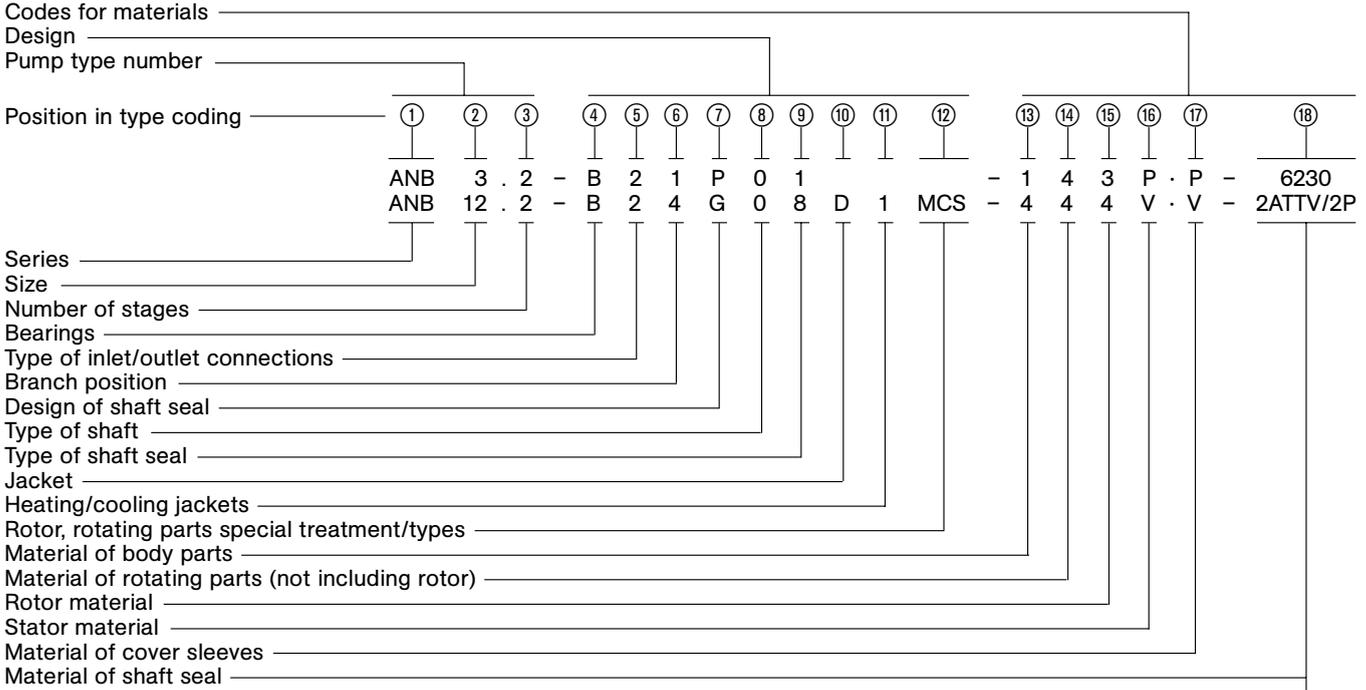
Performance chart

To give a rough indication of the appropriate pump size and speed as a function of the required output and the nature of the liquid to be pumped. $V_{gH,m''}$ = mean rubbing speed of rotor in stator.



Sizes in ANP Series. Information on performance ranges not covered by the ANP 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.

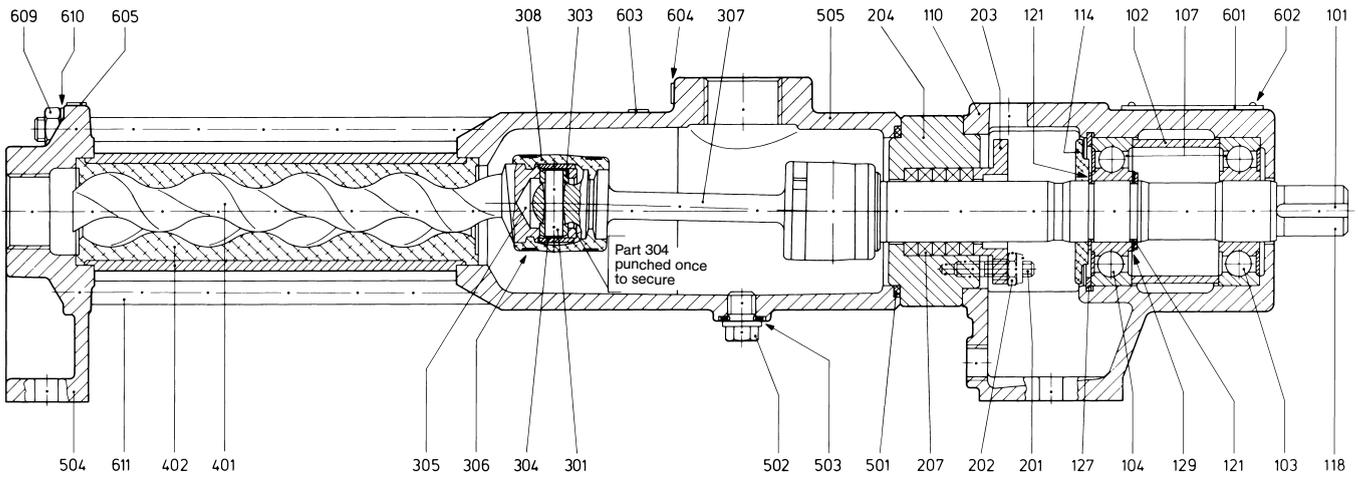
Type coding



Explanatory notes on the type coding:

Position in type coding	Name	Explanation
①	Series	ALLWEILER eccentric screw pump
②	Size	Possible sizes: 3, 6, 12 The numbers indicate the theoretical outlet in l/min at n = 400 1/min and Δp = 0 bar
③	Number of stages	2 = two-stage up to 12 bar
④	Bearings	B = Two deep groove ball bearings with sealing covers to the outside, open to inside of the bearing housing. Small tolerances between shaft and bearing housing on drive side and between flinger ring and bearing housing on pump side prevent the ingress of dirt into the bearing housing. X = Special-type bearings
⑤	Type of inlet-/outlet connections	2 = Threaded connections acc. to dimensional drawing on page 8 X = Special type suction and or discharge connections
⑥	Branch position	For 1, 2, 3, 4 positions see drawing on page 9
⑦	Design of shaft seal	P = Stuffing box or other non-mechanical shaft seal G = Mechanical seal
⑧	Type of shaft	0 = No wear sleeve on shaft

Sectional drawing and parts list



Bearings: **B** (lubricated for life)

Shaft seal: **P01** Stuffing box of standard type (no lantern ring/no flushing ring).

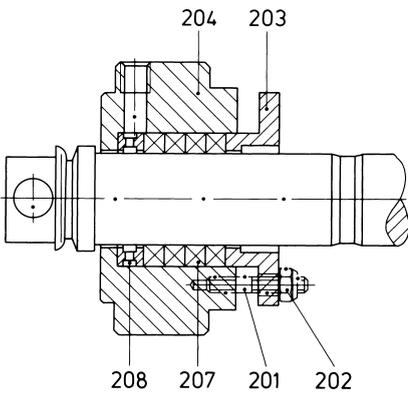
Particularly long packing allows pump to be used in a wide variety of applications. Permitted pressure at shaft seal $p = -0.7$ to 3.0 bar.

Part No.	Description	Part No.	Description	Part No.	Description
101	Key	218	O-ring	603	Instruction label for commissioning
102	Spacer sleeve	219	Mechanical seal	604 ②	Suction label
103	Radial bearing	220 ①	Retaining pin	605 ②	Discharge label
104	Axial bearing	301	Coupling rod pin	609	Hexagon nut
107	Bearing grease	303	Guide bush	610	Washer
110	Bearing housing	304	Retaining sleeve	611	Tie rod
114	Flinger ring	305	Joint lubricant		
118	Drive shaft	306	Clamping band		
121	Retaining circlip	307	Coupling rod		
127	Retaining circlip	308	Cover sleeve		
129	Distance ring				
201	Stud screw	401	Rotor		
202	Self-locking nut	402	Stator		
203	Packing gland				
204	Stuffing box housing	501	O-ring for suction casing		
207	Stuffing box packing	502	Screwed plug		
208	Flushing ring	503	Sealing washer		
209	Lantern ring	504	Discharge casing		
212	Screwed plug	505	Suction casing		
213 ③	Sealing ring				
214	Mechanical seal housing	601	Name plate		
215	Mechanical seal cover	602	Dome headed grooved pin		

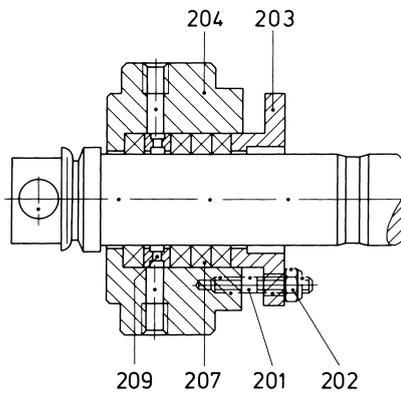
① Only fitted to types G 02 to G 09.

② So positioned for normal direction of rotation (counter-clockwise looking from drive end). For clockwise rotation the labels change places to match the change in the function of the connections.

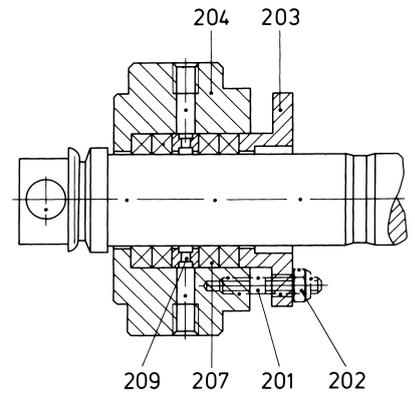
③ With shaft seal types G 04 to G 07 screwed plug sealed with Loctite.



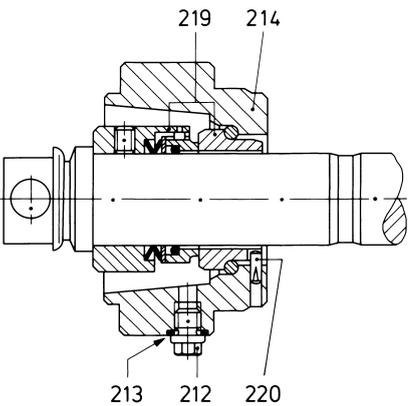
P02 Stuffing box with flushing ring
Suitable for highly abrasive pumped liquids with external flushing
 $p = -0.7$ to 8.0 bar



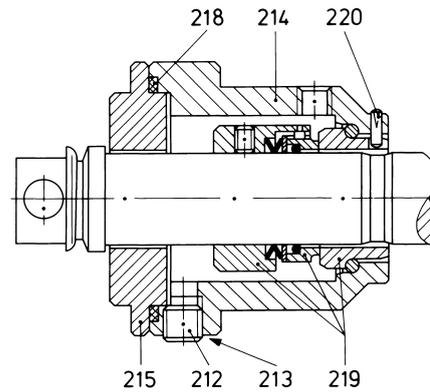
P03 Stuffing box with internal lantern ring
Suitable for uncontaminated pumped liquids with internal liquid sealing, or for abrasive pumped liquids with external liquid sealing
 $p = -0.8$ to 6.0 bar



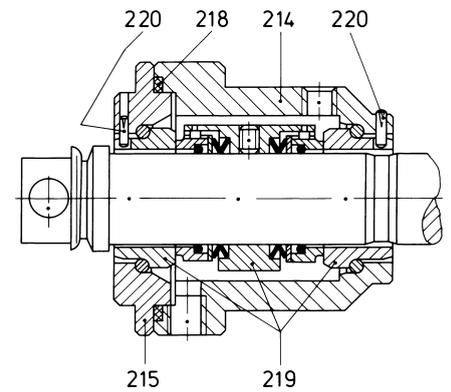
P04 Stuffing box with external lantern ring
For use where external sealing liquid incompatible with pumped liquid or where the ingress of air is to be prevented
 $p = -0.9$ to 4.0 bar



G00 to G03 Mechanical seal, single acting non-balanced, either direction of rotation, (type **G02** shown in drawing).
For pressures of $p = -0.5$ to 10 bar – consult manufacturers.

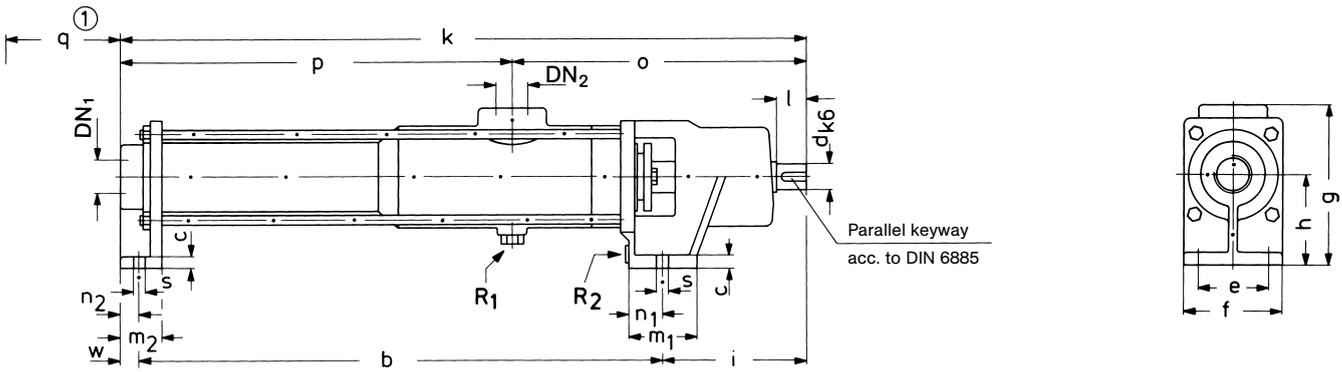


G04 to G07 Mechanical seal, single acting non-balanced, either direction of rotation, with throttled outlet for seal liquid into pump chamber (type **G06** shown in drawing).
Can be used for pressures of $p = -0.5$ to 10 bar – consult manufacturers.



G08 and G09 Mechanical seal, double acting non-balanced, either direction of rotation, (type **G09** shown in drawing).
Can be used for pressures of $p = -0.95$ to 15 bar – consult manufacturers.

Pump dimensions, auxiliary connections, weights

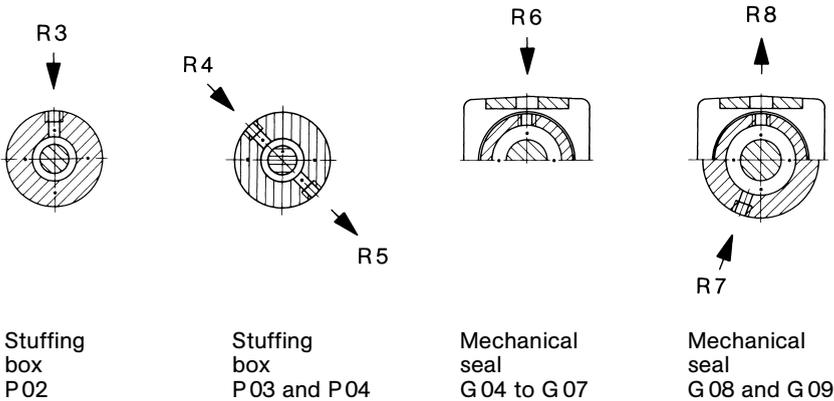


Dimensions in mm.
Internal diameters of suction, discharge and auxiliary connections in inch.
The manufacturer reserves the right to make technical modifications without prior notice.

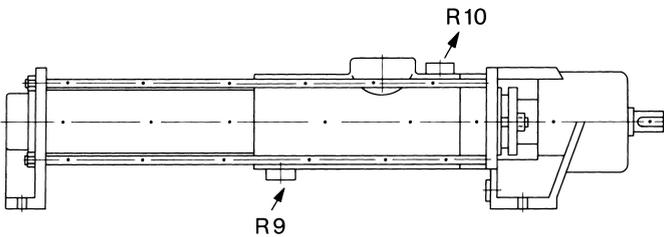
Direction of rotation:
Counterclockwise looking from the drive end is standard, in which case DN₁ = delivery connection, DN₂ = suction connection.
Opposite direction of rotation is possible in which case DN₁ = suction connection, DN₂ = delivery connection.

Pump size	Pump dimensions																Suction/Discharge connections DN ₂ /DN ₁ ②	Approx. weight in kg				
	b	c	d	e	f	g	h	i	k	l	m ₁	m ₂	n ₁	n ₂	o	p			m ₁	s	w	
3.2	381								523							270	160				R 1	11
6.2	421	10	20	70	85	135	80	125	563	30	60	35	30	17	253	310	160	9	17		R 1	11.5
12.2	457								599							346	190				R 1 1/4	12

Positions of auxiliary connections to shaft seal (looking from drive end)



Auxiliary connections where jacket fitted for heating or cooling (only available with stainless steel versions)



Heating or cooling liquid:
max. permissible pressure 10 bar
max. permissible temperature 180°C

Sizes/Tappings of auxiliary connections

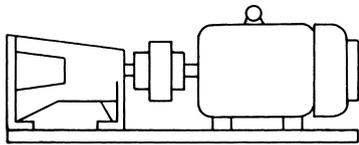
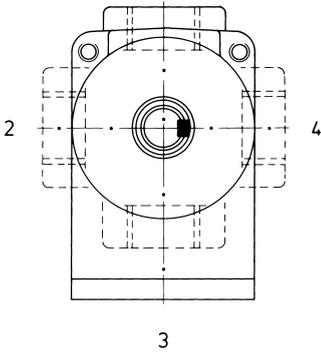
Drain opening ③ R1	Outlet for gland leakage ② R2	Flushing connection ③ R3 R6		Gland seal connection ③ R4/R5 R7/R8		Heating/cooling connections ③ R9/R10
G 1/4	R 1/4	G 1/8	G 1/4	G 1/8	G 1/4	G 3/8

- ① Space required for stator replacement
- ② Straight internal threaded to DIN 2999 part 1
- ③ Straight internal threaded to ISO 228

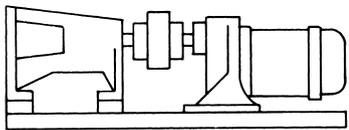
All auxiliary connections can, on request also be supplied in the same nominal bore with NPT-thread.

Possible branch positions
looking from drive end

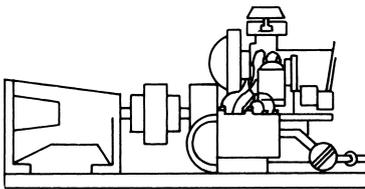
1 = standard



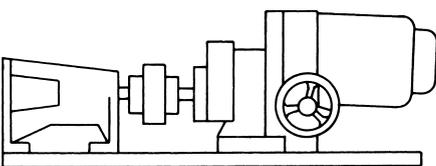
1 ANP with flexible coupling and electric motor



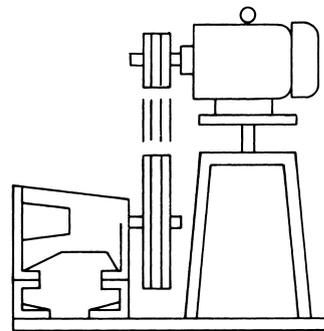
2 ANP with flexible coupling and geared motor



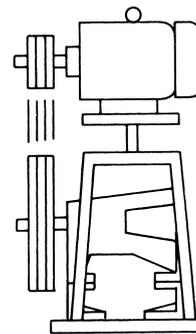
3 ANP with flexible coupling and internal combustion engine



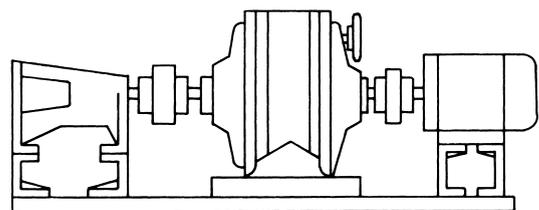
6 ANP with flexible coupling and infinitely variable speed gear



4 ANP with V-belt-drive, adjustable motor platform and motor situated behind the pump



5 ANP with V-belt-drive, adjustable motor platform and motor situated above the pump



7 ANP with flexible coupling, gear box or variable speed gear, flexible coupling and motor

Other types of driver (e.g. hydraulic or pneumatic drivers) can be used.

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	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 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.



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