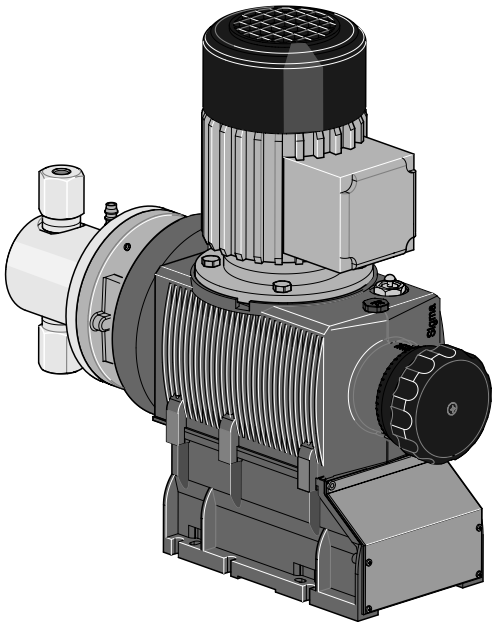
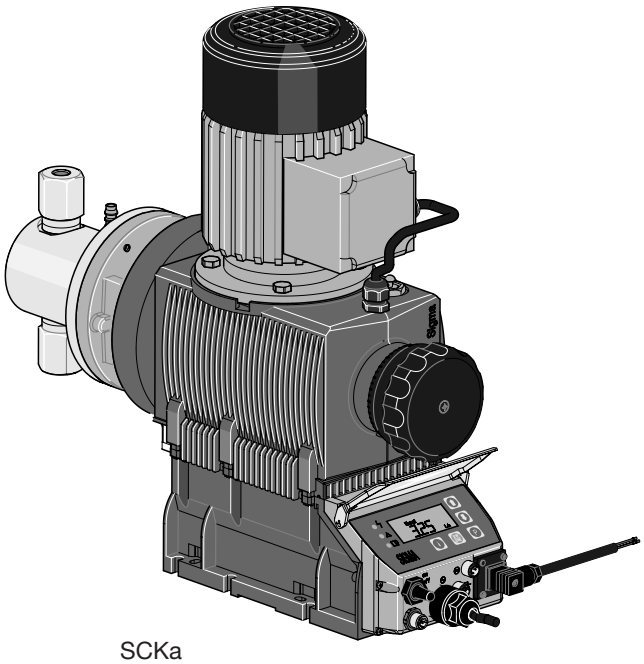
Operating Instructions Manual

Sigma Piston Metering Pump
SBKa (Basic Model)
SCKa (Control Model)



SBKa



SCKa

SBKa ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

SCKa ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Please enter the identity code of the device here.

Three operating instruction manuals are required for the safe and correct operation of the ProMinent® Sigma SBKa and SCKa piston metering pumps:

this product-specific “Operating Instructions Manual Sigma Piston Metering Pump”,
the “Operating Instruction Manual Sigma/ 2”
and the “General Operating Instructions ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories”;
All three are valid only when read in conjunction with one another!

Please read through operating instructions carefully before use. Do not discard.
The operator shall be liable for any damage caused by installation or operating errors!

Part No. 987281 ProMinent Dosiertechnik GmbH · 69123 Heidelberg · Germany BA SI 030 10/08 GB

Publishing details:
Operating Instructions Manual Sigma Piston Metering Pump
SBKa (Basic Model)
SCKa (Control Model)

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Subject to revision
Printed in Germany

Please state the Identcode and serial number, which you will find on the nameplate, with any query or spare parts order. This will enable clear identification of the pump type and material variants.

SBKa **Sigma Base Model (SBKa)**

HK main drive, piston

Pump type: (digits 1 - 3 = back pressure [bar], digits 4 + 5 = feed rate [L/H])

32002	07012
23004	04522
10006	02534
14006	04022
10011	02541
05016	01264

SS **Liquid end material:** stainless steel

T **Seal material:** PTFE seal

4 **Displacement elements:** pistons (ceramic oxide)

Liquid end version:
0 without valve springs (standard)
1 with 2 valve springs, Hastelloy C;0.1 bar

0 **Hydraulic connection:** standard threaded connection (in accordance with technical data)

Version:
0 with ProMinent® logo (standard)
1 without ProMinent® logo
M modified*

* Order-related type
For pump characteristics see order documents

El. power supply:
S S 3 ph,230 V/400 V 50/60 Hz,0.18 kW
M 1 ph ,alternating current,230 V 50/60 Hz,0.18 kW
N 1 ph, alternating current,115 V 60 Hz,0.18 kW
L 3 ph,230 V/400 V50 Hz,(EExe,EExde) ,0.18 kW
P 3 ph,230 V/400 V60 Hz,(EExe,EExde) ,0.18 kW
R variable speed motor 3 ph,230/400 V,0.37 kW
V variable speed motor with integr. speed changer 1 ph,230 V50/60 Hz
Z speed controller set.1 ph,230 V;50/60 Hz
1 without motor, with B 14 flange, size 71 (DIN)
2 without motor, with C 56 flange (NEMA)
3 without motor, B 5,size.63 (DIN)

Enclosure rating (motor) :
0 IP 55 (standard)
1 Exe-design (II 2G EEx e II T3)
2 Exde-design (II 2G EEx de IIC T4)
A ATEX drive

Stroke sensor:
0 without stroke sensor (standard)
2 pacing relay (reed relay)
3 stroke sensors (Namur) for explosive area, intrinsically safe

Stroke length adjustment:
0 manual (standard)
1 with servomotor,230 V/50/60 Hz
2 with servomotor,115 V/50/60 Hz
3 with variable speed motor 0...20 size, mA 230 V/50/60 Hz
4 with variable speed motor 4...20 size, mA 230 V/50/60 Hz
5 with variable speed motor 0...20 size, mA 115 V/50/60 Hz
6 with variable speed motor 4...20 size, mA 115 V/50/60 Hz

SBKa ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Please state the Identcode and serial number, which you will find on the nameplate, with any query or spare parts order. This will enable clear identification of the pump type and material variants.

SCKa **Sigma controller type (SCKa)**

HK main drive, piston

Pump type: (digits 1 - 3 = back pressure [bar], digits 4 + 5 = feed rate [L/H])

32002	320 bar, 2.3 l/h
23004	230 bar, 4.8 l/h
10006	100 bar, 6.4 l/h
14006	140 bar, 7.1 l/h
10011	100 bar, 13.1 l/h
05016	50 bar, 16.7 l/h
07012	70 bar, 14.8 l/h
04522	45 bar, 26.7 l/h
02534	25 bar, 34.1 l/h
04022	40 bar, 26.5 l/h
02541	25 bar, 49.2 l/h
01264	12 bar, 64 l/h

Liquid end material:
SS stainless steel

Seal material:
T PTFE seal

Plunger:
4 pistons (ceramic oxide)

Liquid end version:
0 without valve springs (standard)
1 with 2 valve springs, Hastelloy C;0.1 bar

Hydraulic connection:
0 standard threaded connection (in accordance with technical data)

Version:
0 with ProMinent® logo
1 without ProMinent® logo

El. power supply:
U 1 ph 100-230 V ±10 %, 50/60 Hz

Cables and connectors:
A 2 M Europe
B 2 M Swiss
C 2 M Australian
D 2 M USA

Relays:
0 without relay
1 fault indicating relay N/C
3 fault-indicating relay N/O
4 as 1 + pacing relay
5 as 3 + pacing relay

Control variant:
0 manual +external with pulse control
1 man.+external +pulse control +analogue
4 as 0 + process-timer
5 as 1 + process-timer +analogue
P PROFIBUS®

Access code:
0 without access code
1 with access code

Dosing monitor:
0 input with pulse evaluation
1 input with cont. evaluation

Stroke length adjustment:
0 manual

SCKa ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

1 Safety instructions

General instructions for use

This operating instructions manual describes the special features of the Sigma piston metering pump.

WARNING

You must follow the instructions in this operating instructions manual, the "Sigma/ 2 Operating Instructions Manual" and the "General Operating Instructions Manual for ProMinent® Motor Driven Metering Pumps and Hydraulic Accessories" before assembly, installation and maintenance!

Please read through the following instructions for use carefully. They will help you to make the best use of the operating instructions manual.

The following are particularly highlighted in the text:

- numbered points
- ▶ practical instructions

Operating instructions:

IMPORTANT

Notes are intended to make your work easier.

and safety instructions with pictographs:

WARNING

describes a potentially hazardous situation. If not avoided, could put your life at risk or result in serious injury.

CAUTION

describes a potentially hazardous situation. If not avoided, could result in slight or minor injury or damage to property.

ATTENTION

describes a potentially damaging situation. If not avoided, could result in damage to property.

1.1 Correct use

- This pump is a fluid pump and is designed for metering liquid media within the specified capacity range!
- In potentially explosive operating sites in zone 1, device category II 2G of the explosion group II C, the pump may only be operated with the corresponding rating plate and the corresponding EU declaration of conformity for potentially explosive operating sites pursuant to the directive, 94/9/EU according to the European standards. The explosion group, category and type of protection stated on the plate must correspond or be superior to the conditions given in the planned area of application.
- Observe the general constraints with regard to viscosity limits, chemical resistance and density.
- All other uses or modifications are prohibited!
- The pump is not suitable for metering gaseous media or solids!
- Pumps without corresponding rating plate and the corresponding EU declaration of conformity for potentially explosive operating sites may never be operated in potentially explosive operating sites.
- Observe material resistances when metering chemicals. See the resistance lists in the latest Product Catalogue or at www.prominent.de.
- Pumps with piston liquid ends are not suitable for metering life-threatening liquids.
- They must not be operated in any other than the conditions described in section 3.
- It is essential that you read this operating instruction manual and “Operating Instructions Sigma/ 2” together with the “General Operating Instructions for ProMinent® Metering Pumps and Hydraulic Accessories” concerning assembly, installation and maintenance!
- The pump must be operated by appropriately trained and authorised personnel!
- You are obliged to observe the information in the operating instructions on the various performance phases of the device!

1.2 Safety equipment

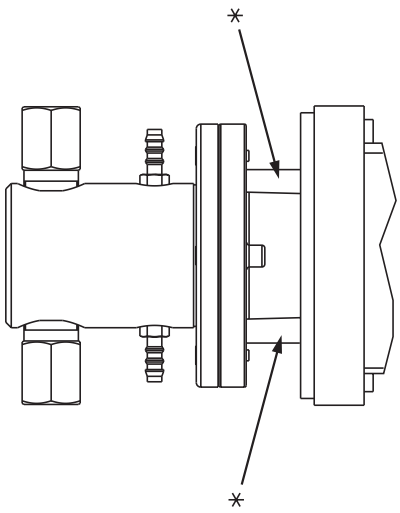


Fig.1: Safety cover, two piece (*)

2 Product description

2.1 Identification of the pump type

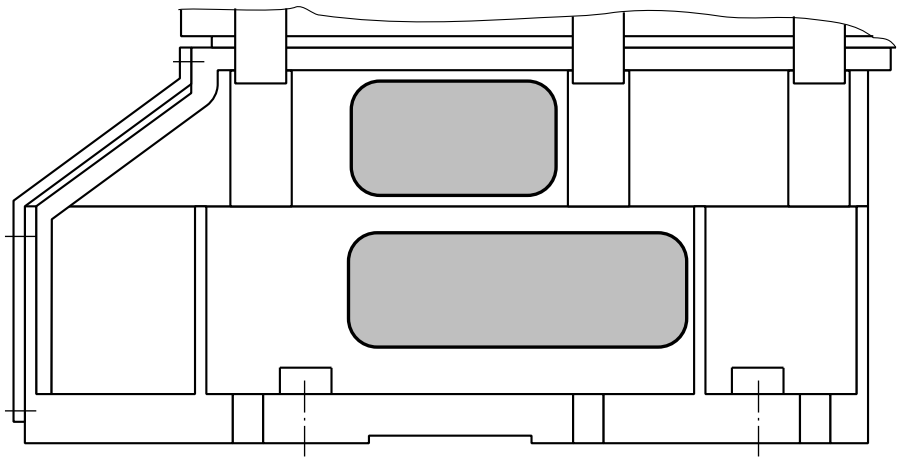
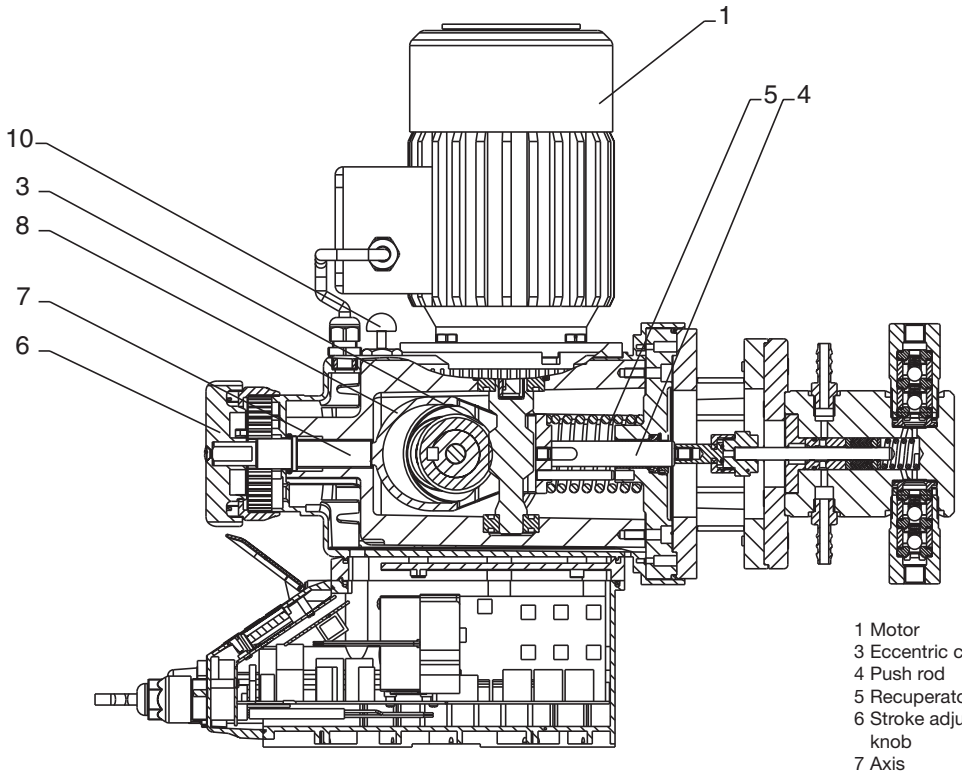


Fig. 2

The identcode and serial number are specified along with the usual basic technical data. State both numbers when contacting customer services in order to ensure clear identification of the pump type.

2.2 Design/function description

2.2.1 Section drawing SBKa/SCKa



1 Motor
3 Eccentric cam
4 Push rod
5 Recuperator
6 Stroke adjustment knob
7 Axis
8 Uptake fork
10 Gearbox venting plug

Fig. 3

2.2.2 Illustration of the stroke action

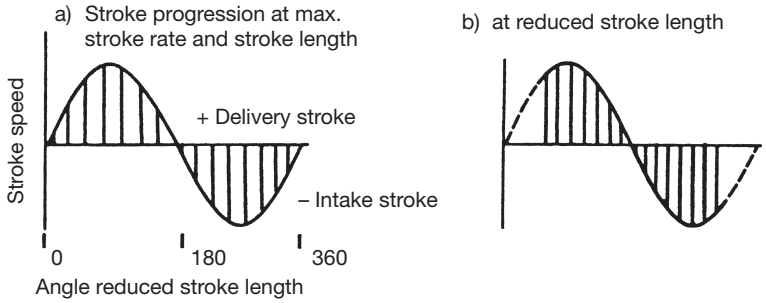


Fig. 4

Set the piston metering pump Sigma stroke length depending on the required feed rate.

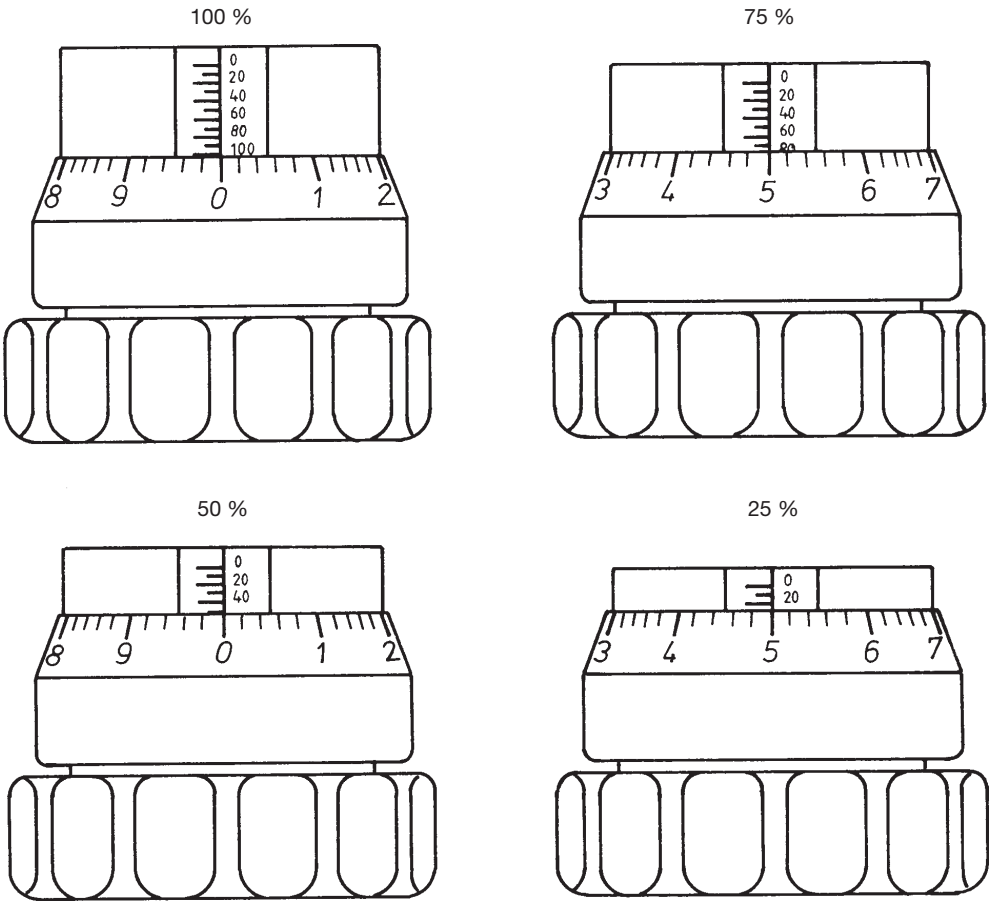
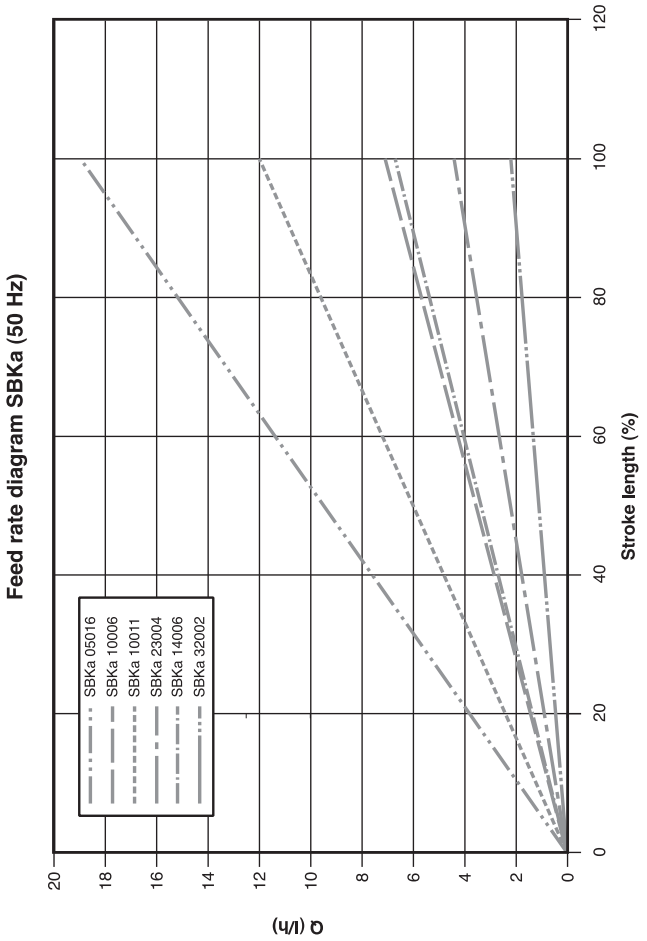


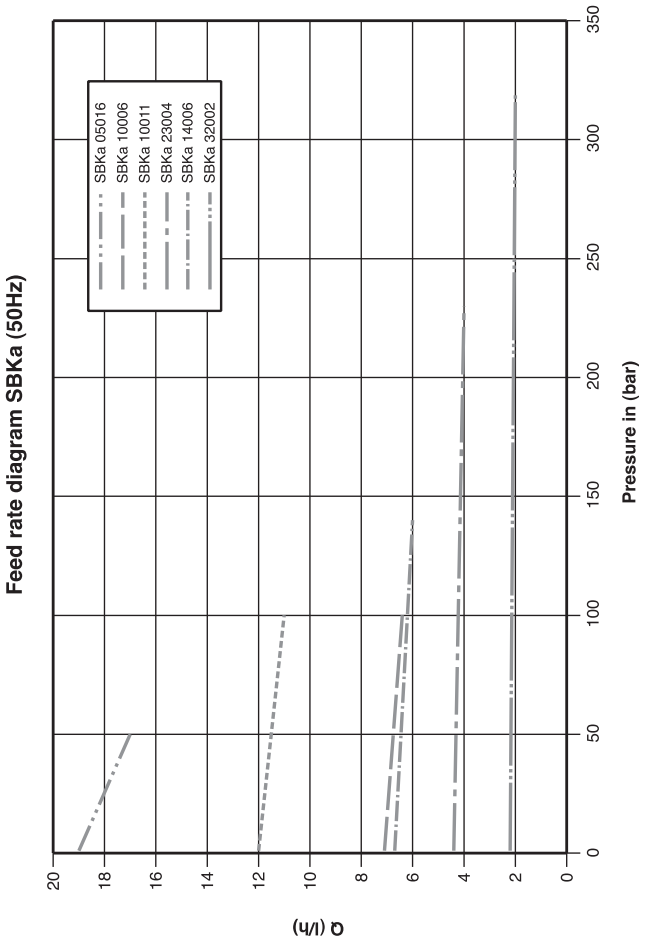
Fig. 5

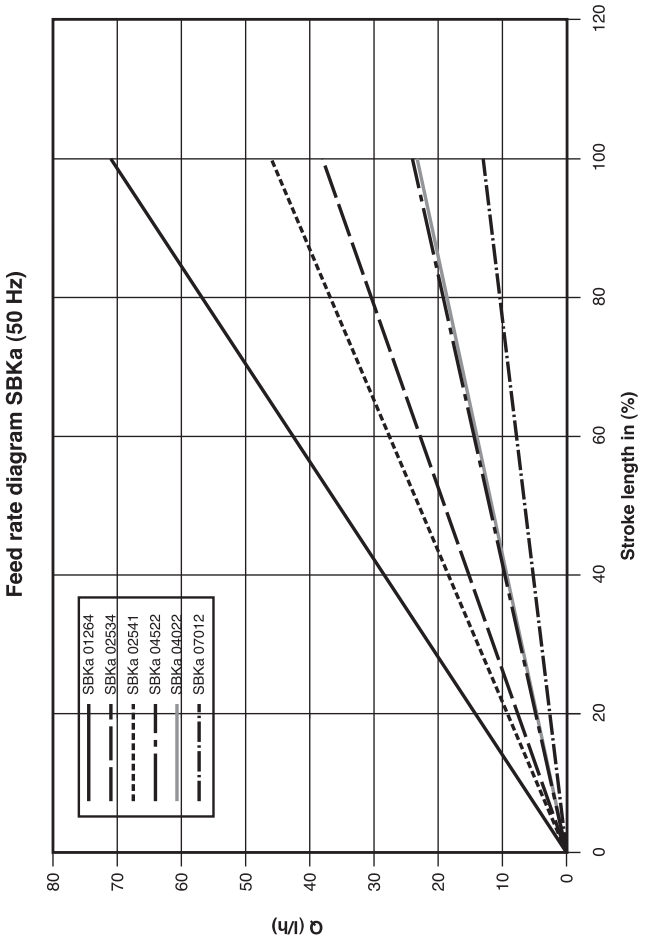
IMPORTANT

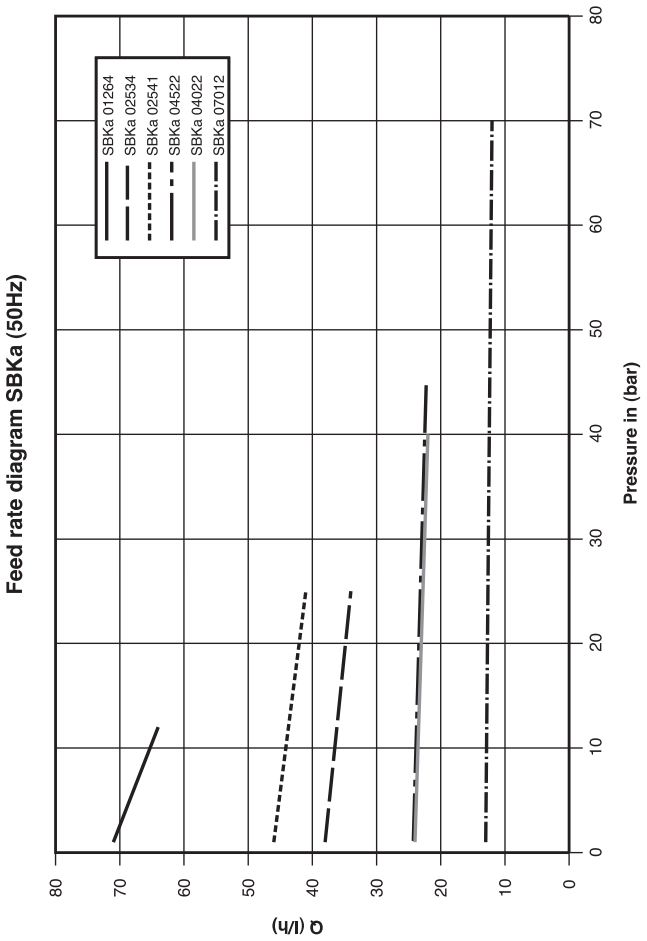
- **Select a stroke length as large as possible for viscous media!**
- **Select a stroke length as large as possible for outgassing media!**
- **Select a stroke length as large as possible for a good mixture!**
- **Do not adjust the stroke length below 10 % (30 % for delivery unit FK 08) to obtain an accurate metering for volume-proportional metering.**

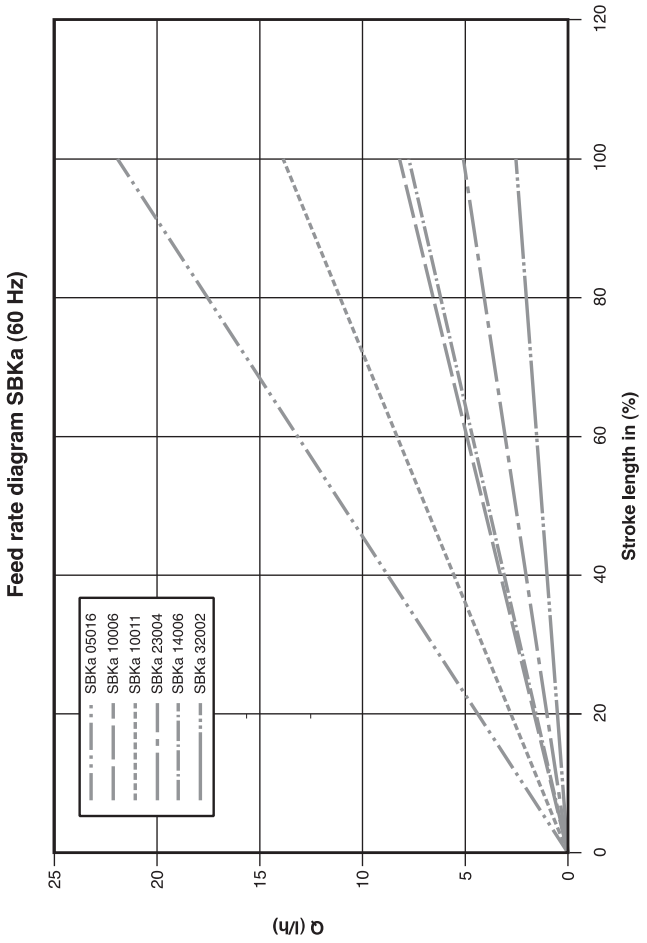
2.2.3 Feed rate diagram

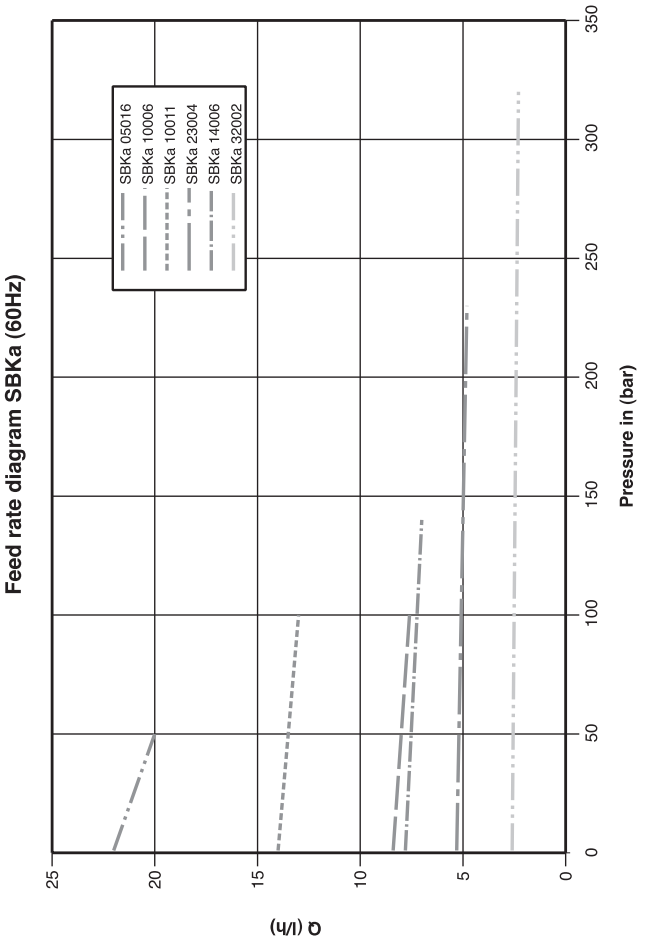


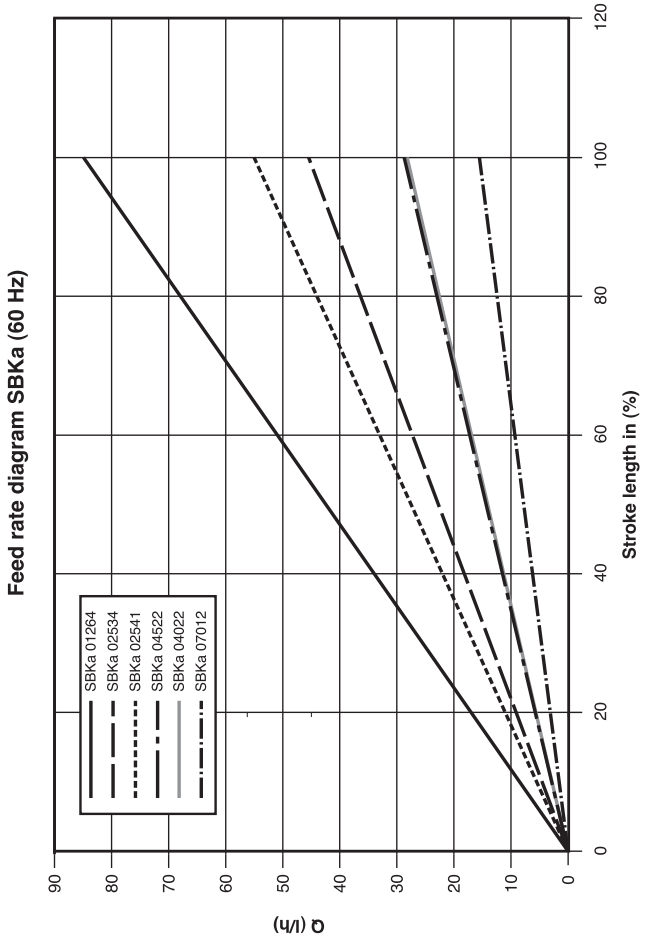


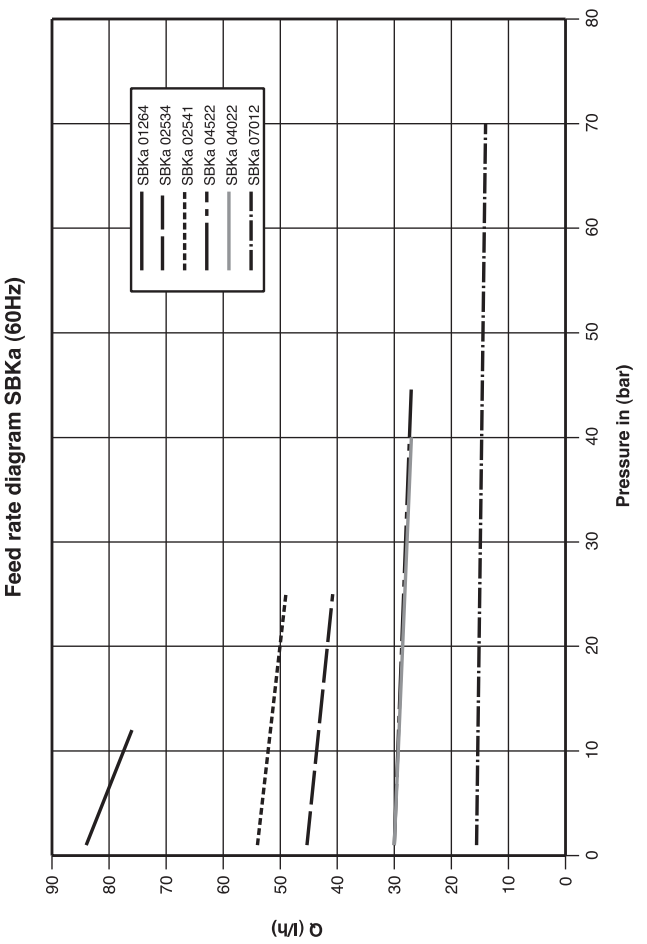


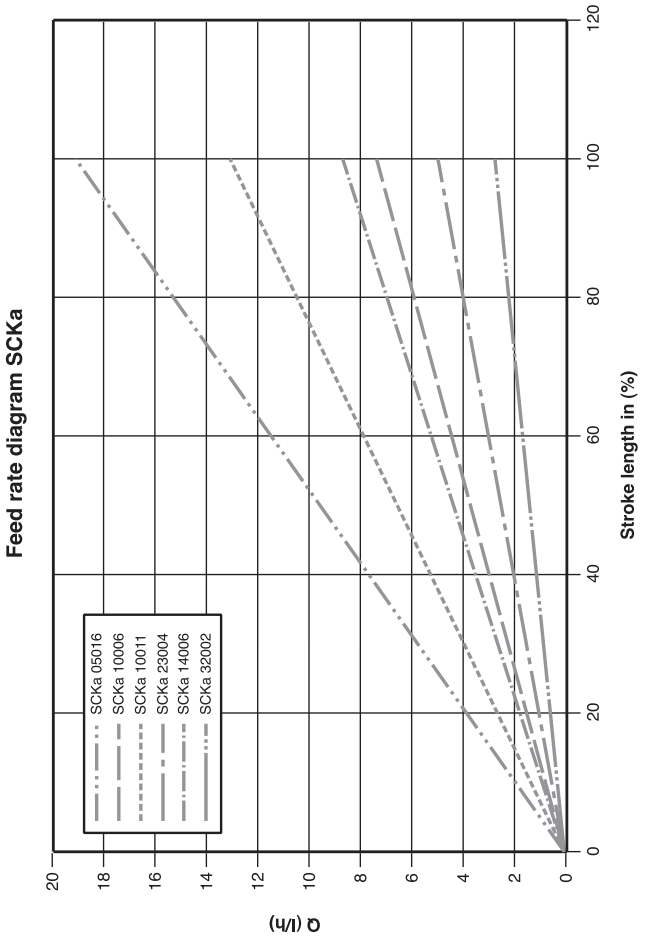


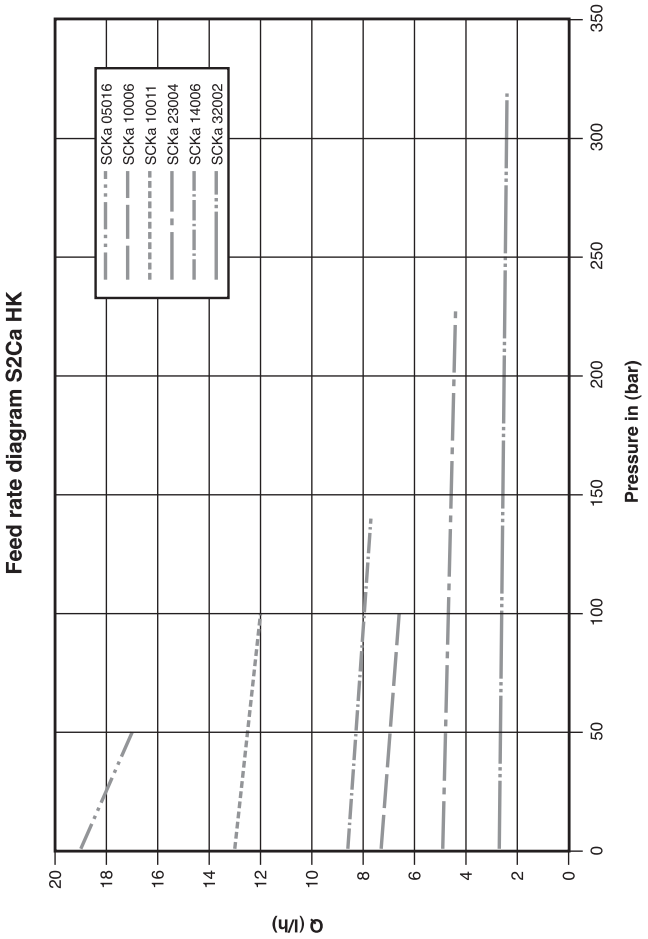

Feed rate diagram SBKa (60 Hz)
SBKa 05016
SBKa 10006
SBKa 10011
SBKa 23004
SBKa 14006
SBKa 32002
Q (l/h)
Stroke length in (%)

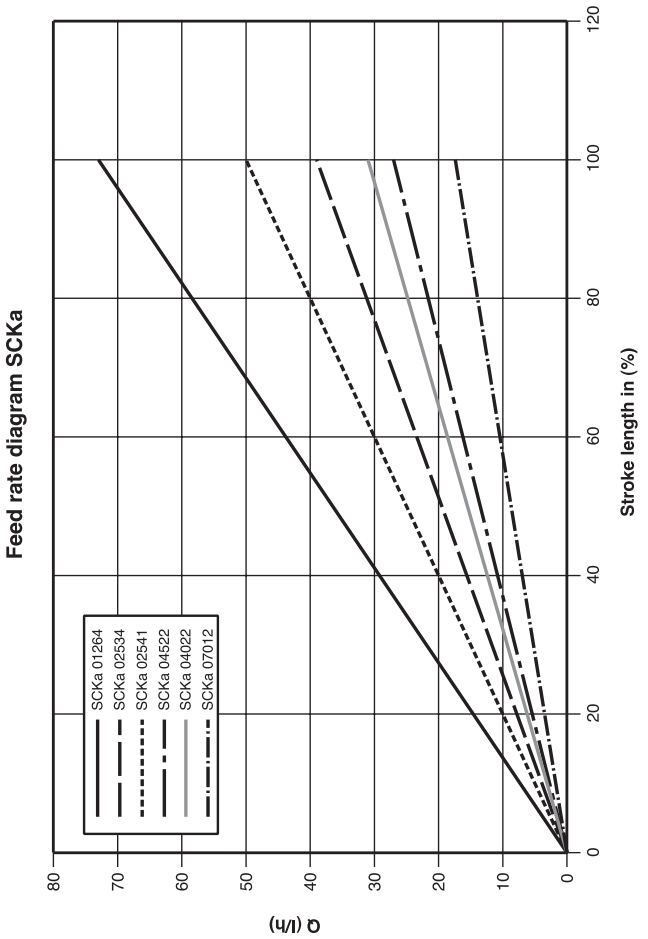

Feed rate diagram SBKa (60Hz)
SBKa 05016
SBKa 10006
SBKa 10011
SBKa 23004
SBKa 14006
SBKa 32002
Q (l/h)
Pressure in (bar)

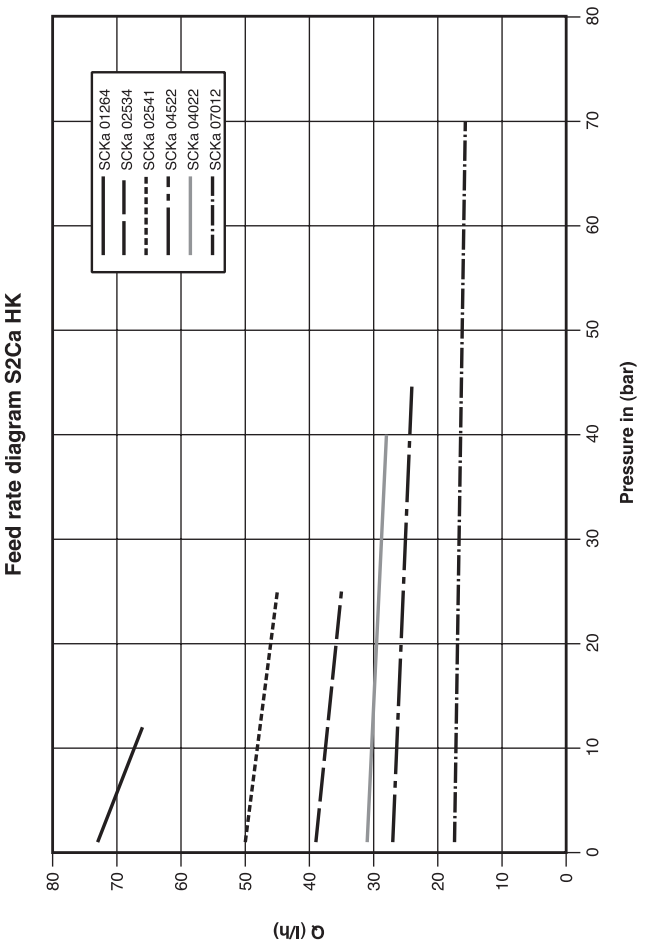

Feed rate diagram SBKa (60 Hz)
SBKa 01264
SBKa 02534
SBKa 02541
SBKa 04522
SBKa 04022
SBKa 07012
Q (l/h)
Stroke length in (%)


Feed rate diagram SBKa (60Hz)
SBKa 01264
SBKa 02534
SBKa 02541
SBKa 04522
SBKa 04022
SBKa 07012
Q (l/h)
Pressure in (bar)


Feed rate diagram SCKa
Q (l/h)
Stroke length in (%)
SCKa 05016
SCKa 10006
SCKa 10011
SCKa 23004
SCKa 14006
SCKa 32002


Feed rate diagram S2Ca HK
Q (l/h)
Pressure in (bar)
SCKa 05016
SCKa 10006
SCKa 10011
SCKa 23004
SCKa 14006
SCKa 32002


Feed rate diagram SCKa
Q (l/h)
Stroke length in (%)
SCKa 01264
SCKa 02534
SCKa 02541
SCKa 04522
SCKa 04022
SCKa 07012


Feed rate diagram S2Ca HK
Q (l/h)
Pressure in (bar)
SCKa 01264
SCKa 02534
SCKa 02541
SCKa 04522
SCKa 04022
SCKa 07012

2.2.4 Liquid end function description

Piston liquid end function description

The heart of the liquid end is a highly resistant piston (4) made of coated stainless steel. When the piston (4) moves into the liquid end, the suction valve (1) closes and the metering chemical flows out of the liquid end through the pressure valve (3). When the piston moves in the opposite direction, the pressure valve (3) closes due to the vacuum in the liquid end and fresh metering medium flows through the suction valve (1) into the liquid end.

The piston's seal surfaces can be flushed by means of the flushing ring (6).

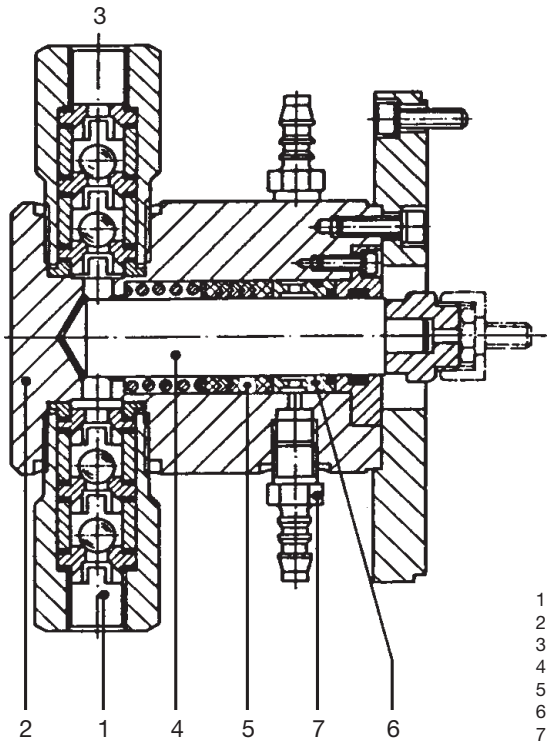


Fig. 6

3 Technical data

WARNING

- **Only for modified type: Please observe the "Supplement for modified type" at the end of the chapter!**
  It replaces and supplements the Technical Data!

3.1 Technical data Sigma piston metering pump

3.1.1 Performance data

Technical data SBKa at 50 Hz operation

	Feed rate at max. back pressure			No. of strokes at max. back pr.	*priming pressure	Adm. suction lift suction side	Connection suction/ discharge side	Shipping weight
Pump type Sigma HK	**bar**	**psi**	**l/h**	**strokes/min**	**WC**	**bar**	**Rp**	**kg**
32002	320	1.9	0.46	71	5	Up to 50 % from max. adm. back pressure	1/4	24
23004	230	4.0	0.52	129	5		1/4	24
10006	100	6.4	0.55	195	5		1/4	24
14006	140	6.1	1.42	71	4		1/4	24
10011	100	11.0	1.43	129	4		1/4	24
05016	50	16.7	1.43	195	4		1/4	24
07012	70	12.4	2.90	71	4		1/4	24
04522	45	22.5	2.91	129	4		1/4	24
02534	25	34.1	2.92	195	4		1/4	24
04022	40	22.4	5.26	71	4		3/8	25
02541	25	41.5	5.37	129	4		3/8	25
01264	12	64.0	5.45	195	4		3/8	25

Technical data SBKa at 60 Hz operation

	Feed rate at max. back pressure				No. of strokes at max. back pr.	*priming pressure	Adm. suction lift suction side	Connection suction/ discharge side	Shipping weight
Pump type Sigma HK	**bar**	**psi**	**l/h**	**gph**	**strokes/ min**	**WC**	**bar**	**Rp**	**kg**
32002	320	4627	2.3	0.6	84	5	Up to 50 % from max. adm. back pressure	1/4	24
23004	230	3335	4.8	1.2	154	5		1/4	24
10006	100	1450	7.6	2.0	233	5		1/4	24
14006	140	2030	7.1	1.8	84	4		1/4	24
10011	100	1450	13.1	3.4	153	4		1/4	24
05016	50	725	20.0	5.2	233	4		1/4	24
07012	70	1015	14.8	3.9	85	4		1/4	24
04522	45	652	26.7	7.0	153	4		1/4	24
02534	25	363	40.8	10.78	233	4		1/4	24
04022	40	580	26.5	7.0	84	4		3/8	25
02541	25	363	49.2	18.0	153	4		3/8	25
01264	12	174	76.0	20.1	233	4		3/8	25

The performance data applies in relation to water at 20 °C.

* The suction lift was determined with full liquid end and full suction pipe for water and correctly sized suction line cross section.

Technical data SCKa at 60 Hz operation

	Feed rate at max. back pressure			No. of strokes at max. back pr.	*priming pressure	Adm. suction lift suction side	Connection suction/ discharge side	Shipping weight
Pump type Sigma HK	**bar**	**psi**	**l/h**	**strokes/ min**	**WC**	**bar**	**RG"-DN**	**kg**
32002	320	4627	1.9	90	5	Up to 50 % from max. adm. back pressure	1/4-8	26
23004	230	3335	4.3	140	5		1/4-8	26
10006	100	1450	6.8	200	5		1/4-8	26
14006	140	2030	6.1	90	4		1/4-8	26
10011	100	1450	11	140	4		1/4-8	26
05016	50	725	17.1	200	4		1/4-8	26
07012	70	1015	12.4	90	4		1/4-8	26
04522	45	652	22.5	140	4		1/4-8	26
02534	25	363	34.2	200	4		1/4-8	26
04022	40	580	22.4	90	4		3/8-10	27
02541	25	363	41.5	140	4		3/8-10	27
01264	12	174	60.9	200	4		3/8-10	27

The performance data applies in relation to water at 20°C.

* The suction lift was determined with full liquid end and full suction pipe for water and correctly sized suction line cross section.

Viscosity The liquid ends are suitable for a maximum viscosity of:

200 mPa s	with valves without valve springs
500 mPa s	with valves with valve springs
1000 mPa s	with accordingly designed installation
> 1000 mPa s	with accordingly designed installation and in consultation with ProMinent

Materials in contact with chemicals

Liquid end	Suction/discharge connectors	Seals	Closing elements	Ball seat	Pistons
Stainless steel 1.4571/1.4404	Stainless steel 1.4571/1.4404	PTFE and/or PTFE with graphite	Oxide ceramic	Stainless steel 1.4571/1.4404	Stainless steel/ ceramic

Temperature details:

Admissible storage temperature: -10 ... 50°C
Admissible ambient temperature: -10 ... 40°C

Maximum medium temperature:

150°C long term, at max. back pressure

Accuracy

The reproducibility of the feed rate is ± 0.5 % at (±1 % for FK 08 liquid end):
- stroke length at least 10 % (30 % for FK 08 liquid end)
- metering liquid - water
- temperature 20°C
- back pressure min.1 bar
- constant conditions.

If this metering reproducibility is not achieved check the installation.

Supplement for modified version:

(Identity code item “Version“: “M-modified“)

[Affix sticker with modified data here!]

3.1.2 Dimension sheet Sigma SBKa

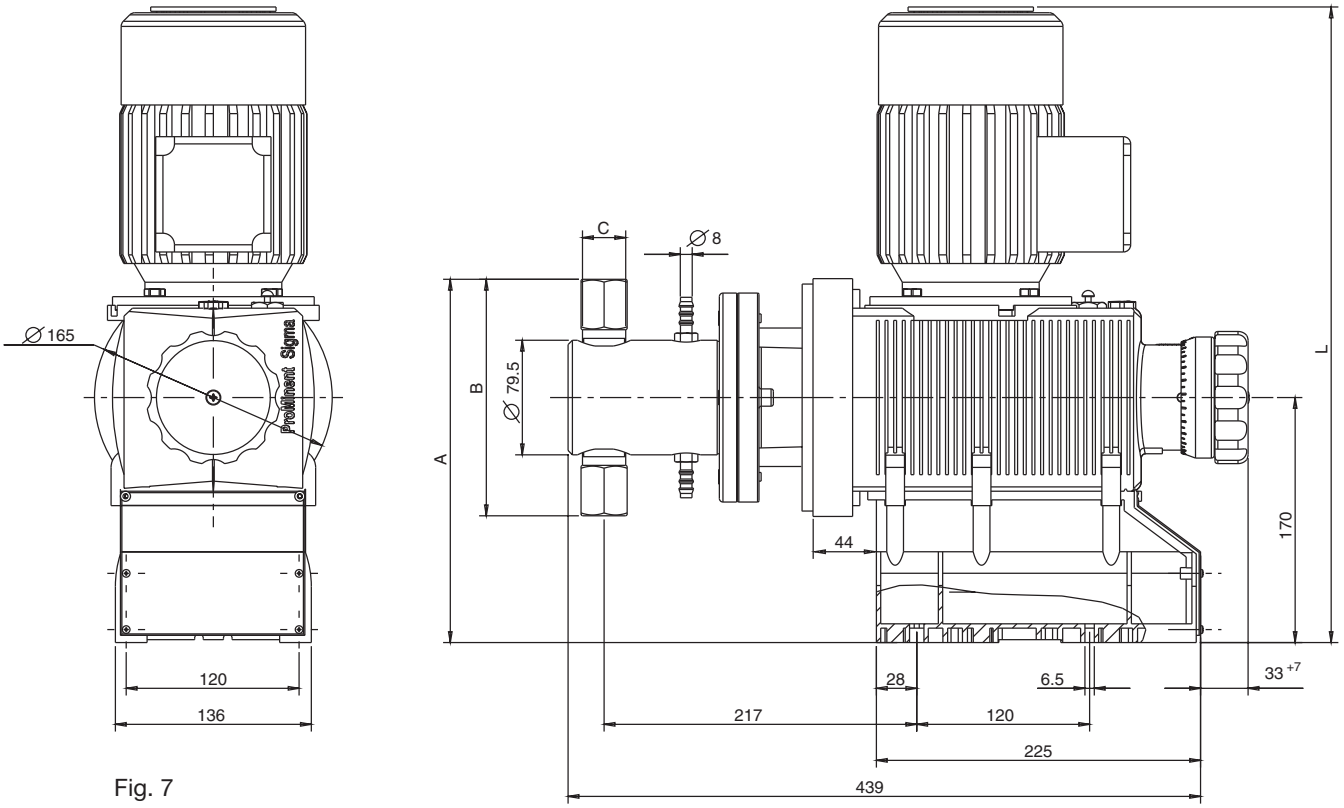


Fig. 7

3.1.3 Dimension sheet Sigma SCKa

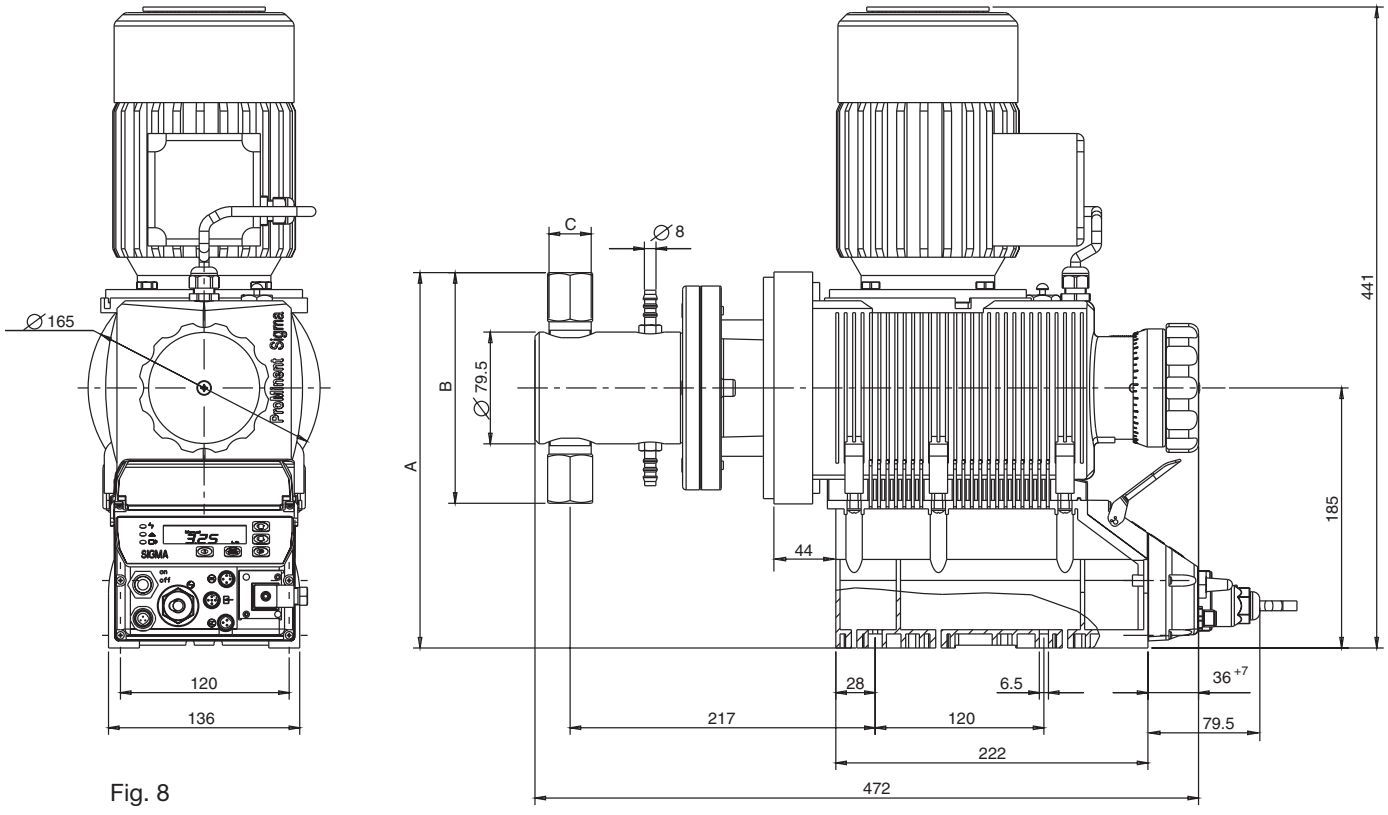


Fig. 8

Table for dimensions sheets Sigma/ 2 HK (dimensions in mm)

Pump type	liquid end	A SBKa	A SCKa	B	C
32002 23004 10006	FK 08	252	267	164	R 1/4" (DN 8)
14006 10011 05016	FK 12.5	252	267	164	R 1/4" (DN 8)
07012 04522 02534	FK 25	252	267	164	R 1/4" (DN 8)
04022 02541 01264	FK 50	254	269	174	R 3/8 " (DN 8)

Supplementary table for dimension sheet SBKa (dimensions in mm)

	Standard motor	Motor controllable	EExe motor	EExde motor	Motor with frequency converter	1-ph. motor
Type	L	L	L	L	L	L
all	426	528	472	448	672	427

4 Installation, hydraulic

WARNING

- **EX pump only: Always observe the "Important supplements for dosing pumps in EX areas" section of the "General Operating Instruction for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!**
- **The liquid ends may contain traces of water from the factory tests. Remove all traces before installation if using with media which should not come into contact with water! Blow out liquid end with compressed air to remove water, then flush out the suction connector with a suitable rinsing agent.**
- **Connect discharge lines in such a way that maximum pressures during the discharge stroke do not exceed the maximum admissible operating pressure of the equipment and the pump.**

ATTENTION

- **If metering media with particle sizes larger than 0.3 mm you must fit a filter in the suction line.**
- **Reproducible metering is only possible at a constant back pressure over 1 bar. If metering via an atmospheric pressure outlet, use a ball check valve to generate a back pressure of approx.1.5 bar.**

Priming pressure

Viscosity The liquid ends are suitable for a maximum viscosity of:

200 mPa s	with valves without valve springs
500 mPa s	with valves with valve springs
1000 mPa s	with accordingly designed installation
> 1000 mPa s	with accordingly designed installation and in consultation with ProMinent

ATTENTION

If you do not fit a flushing assembly ensure that no dust or foreign bodies can pass through the upper hose nozzle.

The liquid end may otherwise be damaged.

Fit e.g. sealing plug (Order No.359585).

Connecting flushing assembly

ATTENTION

- **The flushing medium pressure must not exceed maximum 0.5 bar!**
- **The flushing medium must be compatible with the metering chemical and the liquid end materials.**
- **In the case of very aggressive and toxic media or media with minimal lubricating characteristics you must connect a flushing assembly.**

▶ Connect the flushing assembly to the hose nozzles via two hoses.

5 Commissioning/Maintenance

5.1 Commissioning

WARNING

- **EX pump only: Always observe the "Important supplements for dosing pumps in EX areas" section of the "General Operating Instruction for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!**

ATTENTION

- **The pump is designed for metering liquid media within the specified capacity range.**
- **Observe constraints if you encounter greater medium viscosity or density!**
- **Ensure that liquid end materials are resistant to the metering medium! (see ProMinent® resistance list in the Product Catalogue or at www.prominent.de)**
- **The pump may not be operated in any other than the environmental conditions described in the "Technical data" section!**
- **If metering media with particle sizes larger than 0.3 mm you must fit a filter in the suction line!**

Checking oil level Check that the oil level in the pump reaches the height of the oil inspection glass. In this way you can ensure that the pump has not lost oil or suffered damage in transit due to unprofessional transportation.

5.2 Maintenance

WARNING

- **EX pump only: Always observe the "Important supplements for dosing pumps in EX areas" section of the "General Operating Instruction for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!**
- **Always depressurise suction and discharge lines before working on the pump!**
- **If used with hazardous or unknown media, always wear appropriate personal protection equipment before working on the liquid end!**
- **Only specially trained or authorised personnel may service metering pumps and their peripherals!**
- **If present, always switch off external fans, servomotors or other additional equipment. Check that equipment is disconnected from the power supply.**
- **Secure equipment to ensure that it cannot be turned on by unauthorised personnel during maintenance or repair work on the pump!**

IMPORTANT

Keep a spare part kits in stock for maintenance work!
(part number see "Spare parts")

Maintenance

After every 3 months check:

- firm seating of discharge valve and suction valve
- firm seating of discharge line (discharge and suction side)
- the oil level
- that the pump is feeding correctly (run for short period at max capacity -observe max. admissible operating pressure!)
- that the piston liquid end is not leaking

If subject to heavy use (e.g. continuous operation) we recommend reducing the intervals between services.

The piston packing rings are consumables; their service life depends on the following parameters:

- system back pressure
- operating temperature
- characteristics of the metering medium.

Abrasive and in particular contaminated media will shorten the service life of piston packings. In this case we recommend checking the piston packings for leaks more frequently.

After approx. 5000 operating hours:

- change the gear oil.

Mobilgear gear oil 634 VG 460, ProMinent Part No.555325 (1 liter oil can).

Oil quantity: approx.0.5 l

6 Repair

▶ Stop the pump so that you can reach both the nuts on the push rod with a spanner.

WARNING

- **EX pump only: Always observe the "Important supplements for dosing pumps in EX areas" section of the "General Operating Instruction for ProMinent® Motor-Driven Metering Pumps and Hydraulic Accessories"!**
- **Protect yourself from the metering medium if hazardous!**
- **Always depressurise suction and discharge line before working on the pump!**
- **If used with hazardous and unknown media, always empty and rinse the liquid end before maintenance or repair work!**
- **If used with hazardous or unknown media, always wear appropriate personal protection equipment before working on the liquid end!**
- **Secure equipment to ensure that it cannot be turned on by unauthorised personnel during maintenance or repair work on the pump!**
- **Only send the equipment for repair or maintenance in a cleaned condition and with the liquid end flushed. However, should any safety precautions be necessary even after careful draining and cleaning of the equipment, the required information must be listed in the Safety Declaration!**
- **The Safety Declaration forms part of the inspection/repair contract.**
- **Maintenance or repair work will only be carried out if a Safety Declaration - correctly and fully completed by an authorised and qualified member of the Operator's staff - is available.**
- **A copy of the form is included in the "General operating instructions for ProMinent motor-driven dosing pumps and hydraulic accessories" or can be downloaded at www.prominent.com .**

6.1 Liquid end

ATTENTION

The piston is vulnerable to breakage.

Please take this into account when carrying out repairs.

Dismantling liquid end

- ▶ (if applicable: remove flushing hoses from hose nozzles (31))
- ▶ Remove the upper safety cover from the lantern
- ▶ Slacken the locking nut on the push rod and detach the piston (2) from the push rod (See Fig. 9).

ATTENTION

Do not let the piston drop out!

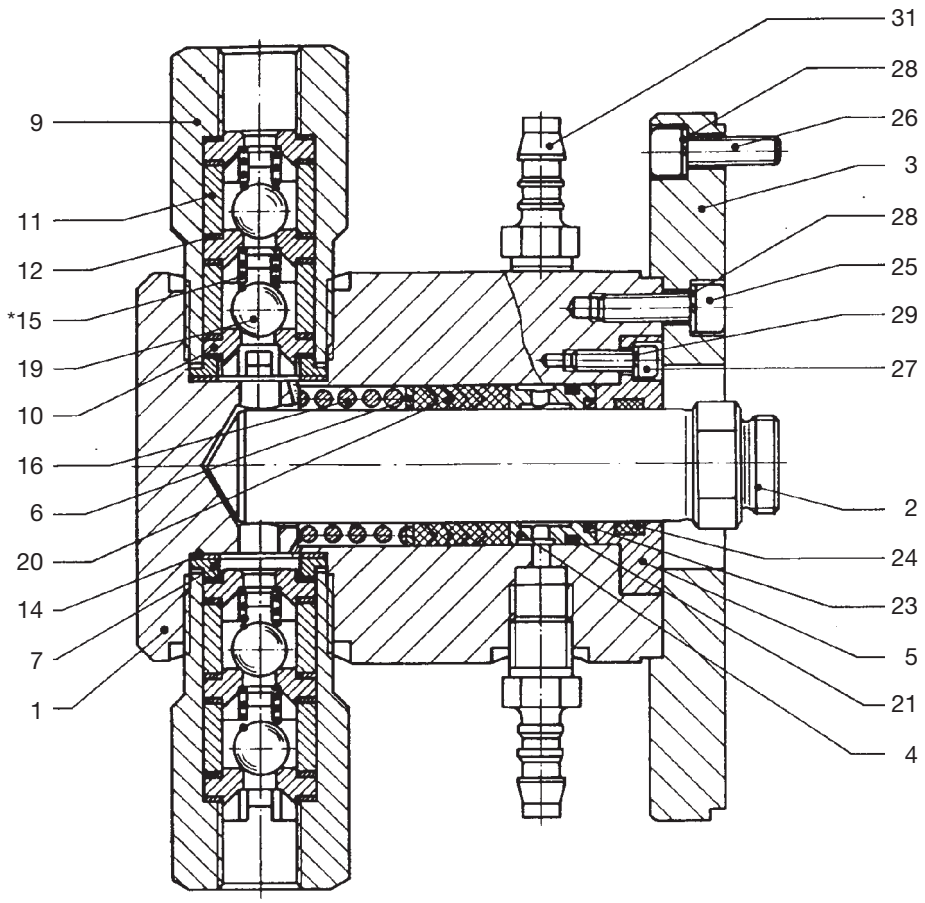


Fig. 9

- ▶ Remove the retaining screws (26) from the liquid end.
- ▶ remove the liquid end and set down on a firm, level base with the label side upwards.

Servicing liquid end

- ▶ Remove piston (2)
- ▶ Slacken the screws (25) on the liquid end flange and lift off liquid end flange (3)
- ▶ Slacken the screws (27) on the guide ring (5) and remove
- ▶ Remove the flushing ring (4), the V-packing collar(20), the disc (6) and spring (16)
- ▶ Clean the sealed compartment thoroughly
- ▶ Dispose of the V-collar packing (20), the O-ring (21) from the flushing ring, the FOI-Ring (23) and the guide band (24)
- ▶ Clean the other dismantled parts.

Reassemble the parts is reverse order

- ▶ Insert the springs (16) and the disc (6) into the liquid end

ATTENTION

Do not damage the sealing lips on the V-packing collar (20)!

Push the V-packing collar (20) into the liquid end (the thicker ring is inserted last).

V-shaped rings -position with the open side towards the liquid end (similar to the FOI-ring (item. 23 in Fig. 10))

- ▶ Draw a new O-ring (21) onto the flushing ring (4)
- ▶ Press a new FOI-sealing ring (21) into the flushing ring (4) (observe direction - see Fig. 10)
- ▶ Push the flushing ring (4) into the liquid end
- ▶ Place the guide ring (5) with a new guide band (24) onto the liquid end and screw tight (5 Nm).
- ▶ Now tighten the screws (27)
- ▶ Place the liquid end flange (3) onto the liquid end and screw tight (7 Nm)
- ▶ Push the piston (2) carefully into the liquid end.

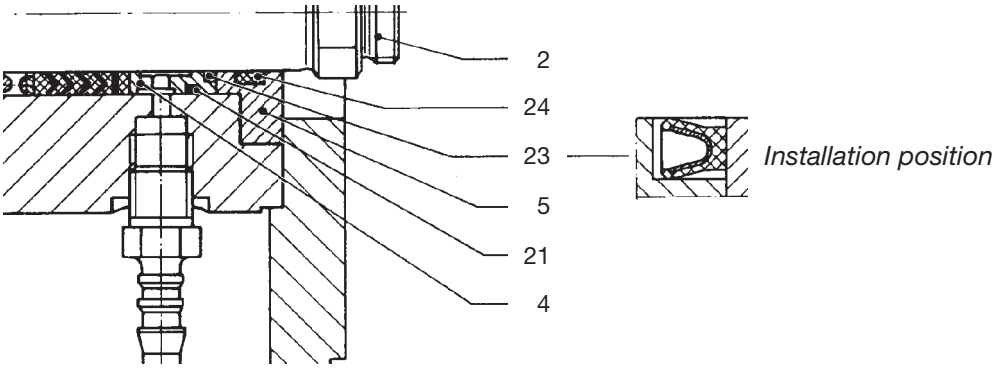


Fig. 10

Assembling liquid end

- ▶ Fasten the liquid end to the drive flange with the retaining screw (26) (pressure valve at the top!)
- ▶ Check that the small O-ring is positioned at the end of the push rod
- ▶ Screw the piston (2) firmly to the push rod
- ▶ Clamp the safety cover into the lantern
- ▶ (If applicable: install flushing hoses onto hose nozzles).

6.2 Servicing double ball valves

Cleaning a pressure valve:

IMPORTANT

- **Always clean the discharge and suction valves one after another. They are not differentiated from one another by arrows.**
- **Use only new parts which fit your valve (in design, shape and chemical resistance).**

Dismantling pressure valve:

- ▶ Unscrew the pressure valve out of the liquid end, rinse and dismantle
- ▶ Rinse and clean all parts
- ▶ Replace worn parts and seals.

Assembling pressure valve:

IMPORTANT

- **Check the alignment of the valve seats (2) when assembling. The valve seats (2) have a finely finished side which serves as the ball valve while the other side works as a ball cage and spring guide. The finely finished side of all valve seats must be pointing in the direction of flow (arrow)!**
- **The spare part kits contain 2 valve seats rather than 3 for each valve as the top valve seat in the drawings can still perform even if it is out of alignment.**

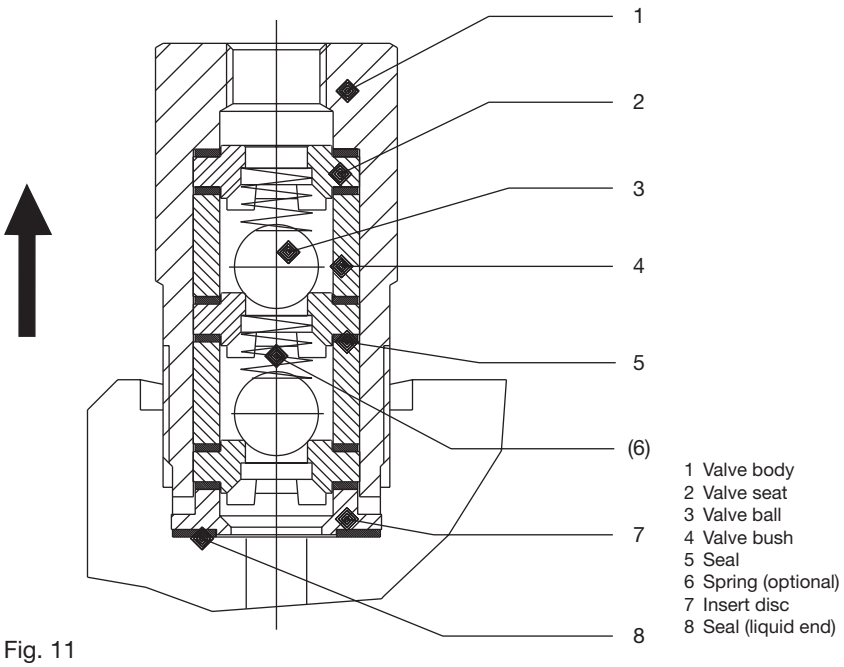


Fig. 11

▶ Slide in turn into the valve body (1):
- a seal (5) and a valve seat (2) (check direction!)
- a seal (5) and a valve bush (4)
- (if applicable: slide a spring (6) into the spring guide of the valve seat (2))
- a ball (3)
- a seal (5) and the second valve seat (2) (direction!)
- a seal (5) and the second valve bush (4)
- (if applicable: slide the second spring into the spring guide of the valve seat)
- the second ball
- a seal (5), the third valve seat (direction!) and another seal (5)

▶ Place the insert disc (7) with the nose facing the stuffing box

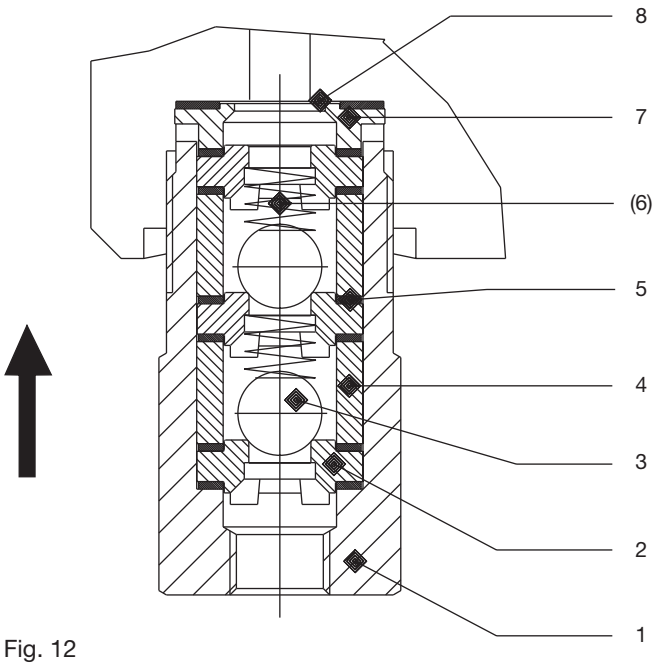
IMPORTANT

The gap between the edge of the valve body and the insert disc is determined by the design!

▶ Place the large seal (8) between the insert disc (7) and the liquid end
▶ Grease the thread of the valve
▶ Screw the valve to the stop.

Cleaning a suction valve: Suction valves are dismantled, cleaned and reassembled in precisely the same way as for discharge valves.

Note however, when reassembling, that the valve seats (2) point in the opposite direction. (The finely finished side of all valve seats (2) must point in the direction of flow (arrow)!



1 Valve body
2 Valve seat
3 Valve ball
4 Valve bush
5 Seal
6 Spring (optional)
7 Insert disc
8 Seal (liquid end)

Fig. 12

7 Spare parts

Spare part kits Sigma HK
comprising (see fig. overleaf):

1 piston, ceramic
4 valve balls
4 ball seat discs
2 PTFE/graphite V-packing collars
2 piston guide bands
14 flat seals
1 O-ring
1 FOI sealing ring

	Order no.
applies to Identcode: 32002, 23004, 10006 **FK 08 for Sigma HK**	1001572
applies to Identcode: 14006, 10011, 05016 **FK 12.5 for Sigma HK**	910470
applies to Identcode: 07012, 04522, 02534 **FK 25 for Sigma HK**	910471
applies to Identcode: 04022, 02541, 01264 **FK 50 for Sigma HK**	910472

Appendix

Exploded view of the liquid end

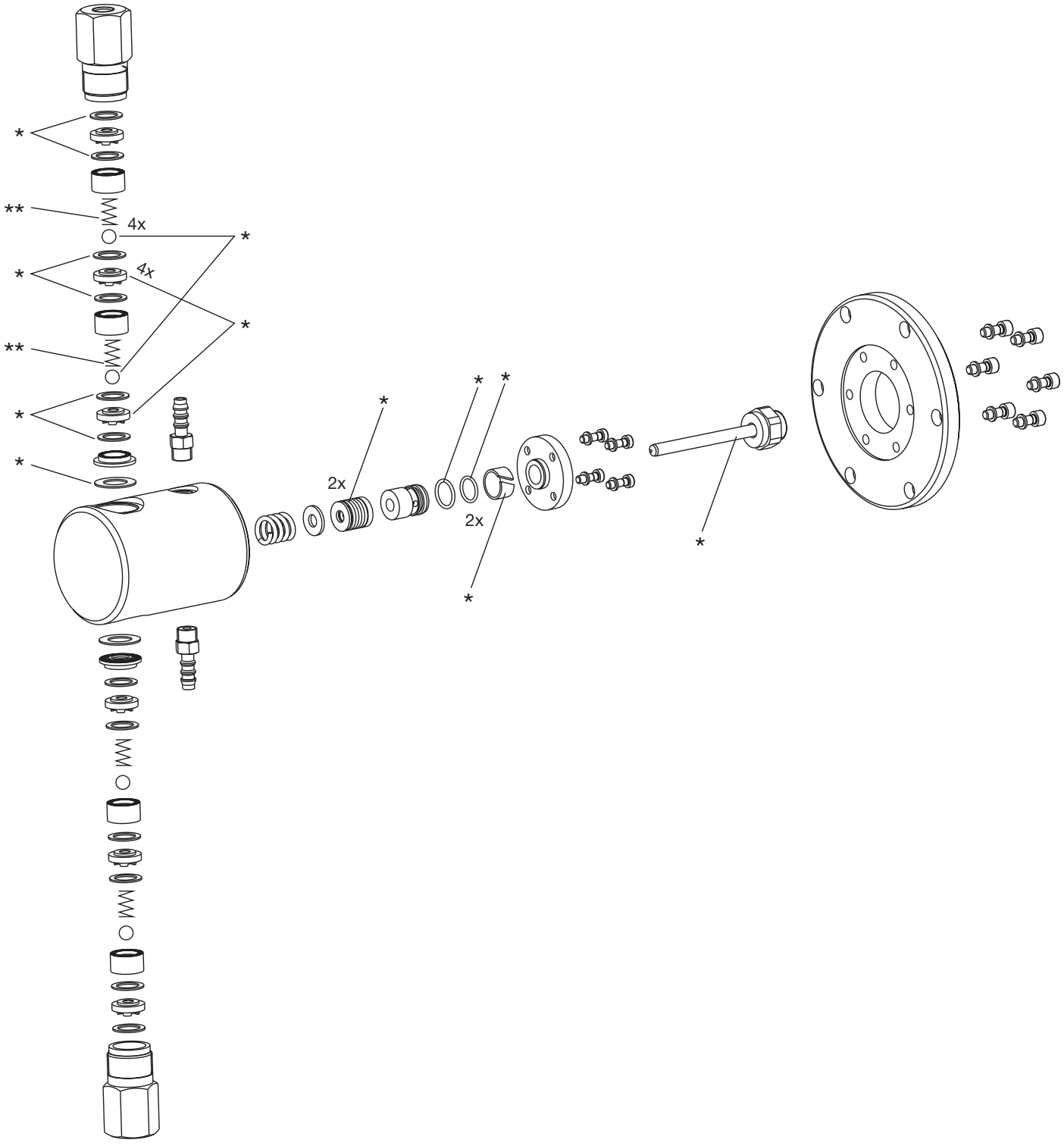


Fig. 13

* The items listed are the components of the spare part kits

** Optional accessories (not in the spare part kits)

We reserve the right to make technical changes.

EC Declaration of Conformity

We,

ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5 - 11
D - 69123 Heidelberg

hereby declare that, on the basis of its functional concept and design and in the version brought into circulation by us, the product specified in the following complies with the relevant, fundamental safety and health stipulations laid down by EC regulations.
Any modification to the product not approved by us will invalidate this declaration.

Product description :	***Metering pump, Series Sigma***
Product type :	***SBKa... / SCKa...***
Serial number :	***see type identification plate on device***
Relevant EC regulations :	***EC - machine regulation (98/37/EC)*** ***EC - low voltage regulation (2006/95/EC)*** ***EC - EMC - regulation (2004/108/EC)***
Harmonised standards used, in particular :	***EN ISO 12100-1, EN ISO 12100-2, EN 809,*** ***EN 60335-1, EN 60335-2-41, EN 61010, EN 60204-1,*** ***EN 60034-5, EN 60529, EN 55014-1/2,*** ***EN 61000-3-2/3, EN 61000-6-2, EN 61800-3***
Date/manufacturer´s signature :	*06.10.2008*
The undersigned :	*Joachim Schall, Head of R&D*

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Stammhaus / Head office

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