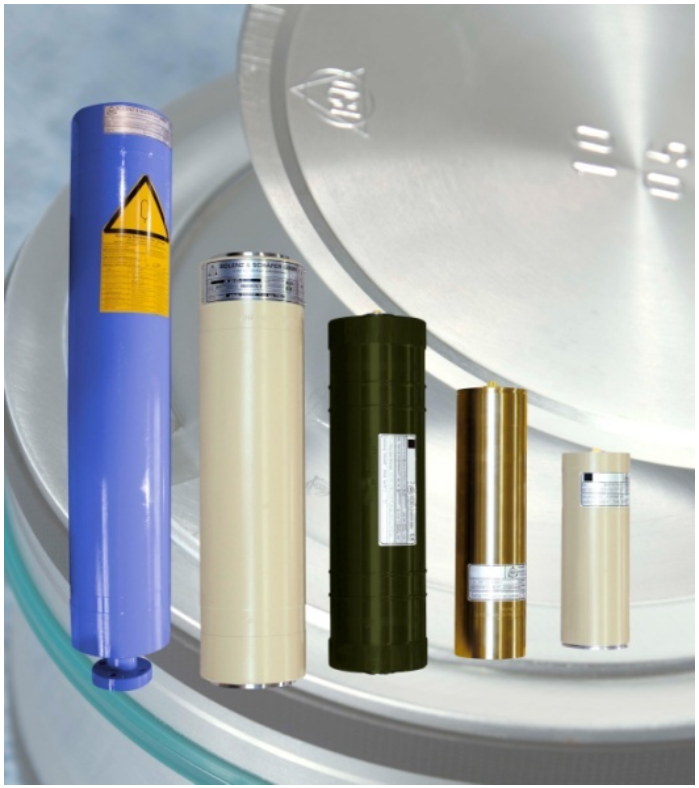
BSD ACCUMULATOR SYSTEMS



BSD typical system features

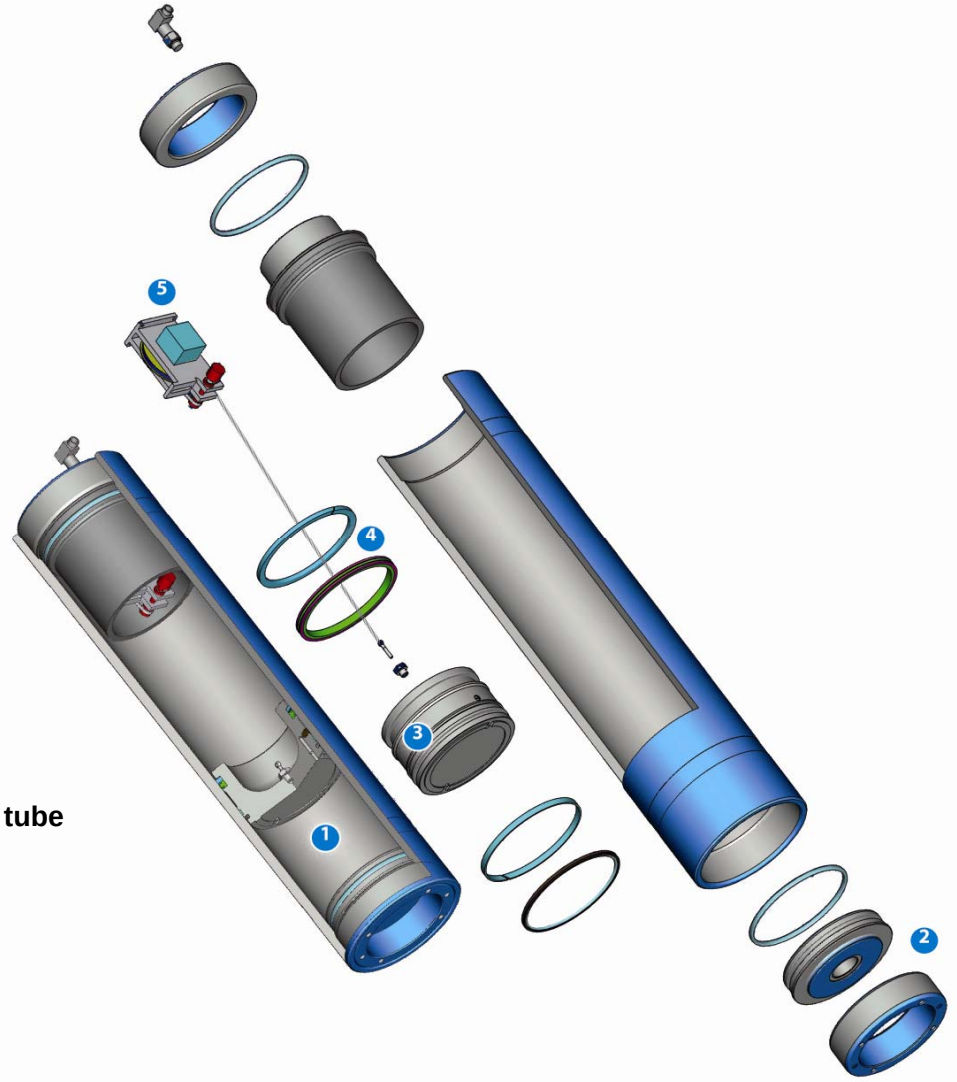
- rugged and durable
- minimum of maintenance effort
- easy service
- increase of efficiency
- highest quality
- improve of energy balance

BSD PISTON ACCUMULATORS

volume:	0,1 to 1.500 l
pressure rating:	200 to 1.200 bar
materials:	steel, stainless steel, special alloys
piston diameter:	60 mm up to 800 mm

TECHNICAL DETAILS

- ***wide ranged program***
- ***flexibility***
- ***product reliability***
- ***service***



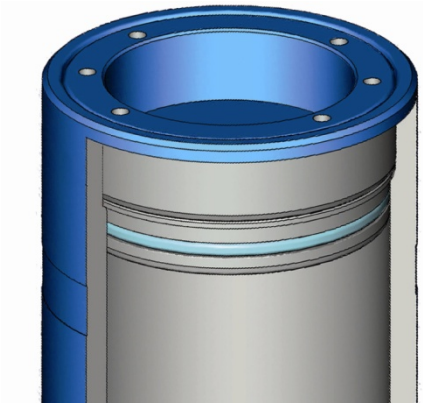
1 **The inside surface of the accumulator tube is rolled and super fine honed**

- optimal percentage contact area
- excellent glide and dry-running operation
- low friction and wear

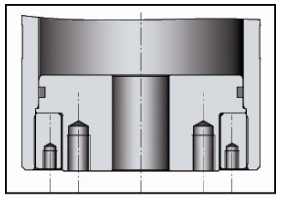
TECHNICAL DETAILS

2 **End caps include O-Ring seals on both sides and are held in position with a separate locking ring**

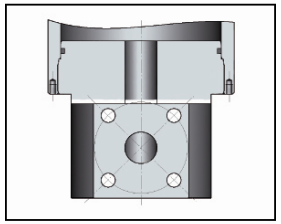
- provides easy assembly and disassembly
- ensures safe and proper installation of the O-Ring seals



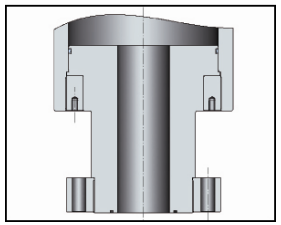
Special connections oil side



example 1: axial flange connection



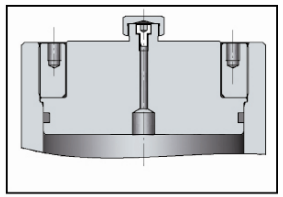
example 2: radial flange connection



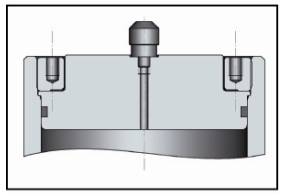
example 3: axial flange connection

Only a possible selection of special connections and gas filling valves is shown above.

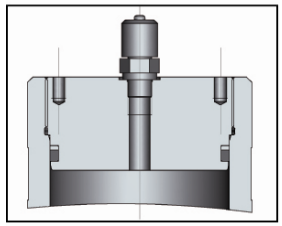
Special connections gas side



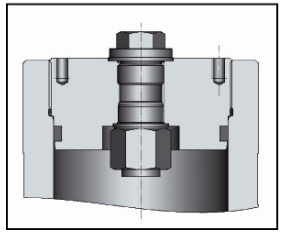
example 1: Filling valve for diaphragm accumulator M 28 x 1.5



example 2: Filling valve with connection 7/8” 14 UNF 1A

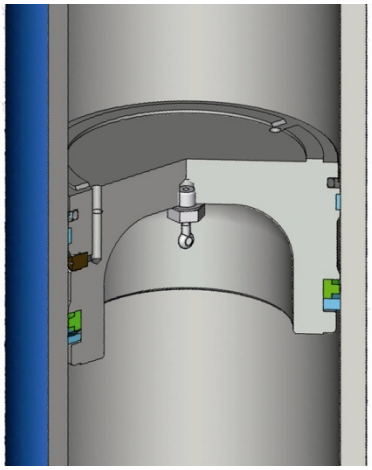


example 3: Minimess filling valve M 16 x 1.5



example 4: BSD Gas fill with connection 3/4”

TECHNICAL DETAILS



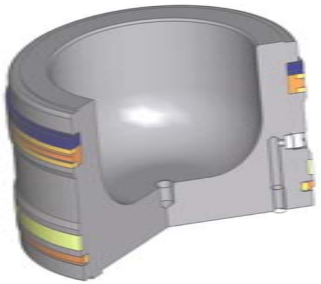
3 **Piston made out of forged material**

- homogenous, non porous and resistant against extensive pressure changes

4 **Double piston seal system with pressure-released intermediate gasket space ensures save separation between oil and gas medium**

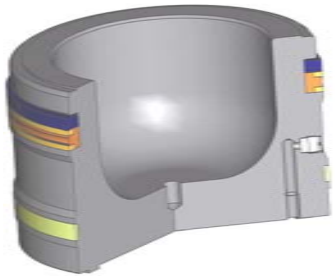
- no pressure build-up during piston stroke
- V-Style gaskets provide excellent lubrication and long lifetime
- double seal system protects against sudden loss of medium
- easy seal replacement
- 100 percent seal inspection (visual, dimensional, and technical)
- special designs available for extreme temperature, low working pressure or high frequency short-stroke operation

BSD SEALING SYSTEMS



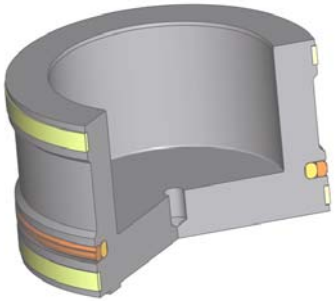
Standard Sealing System

	piston (Ø ≥ 180)
▪ 4 m/s	max. piston speed
▪ HLP, HFC	allowed fluid
▪ 0...350bar	max. pressure
▪ -10...+80°	allowed temperature range



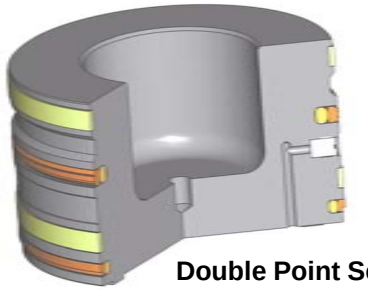
Single Point Sealing System

	piston (Ø ≥ 180)
▪ 1 m/s	max. piston speed
▪ HLP, HFC	allowed fluid
▪ 0...350bar	max. pressure
▪ -10...+80°	allowed temperature range



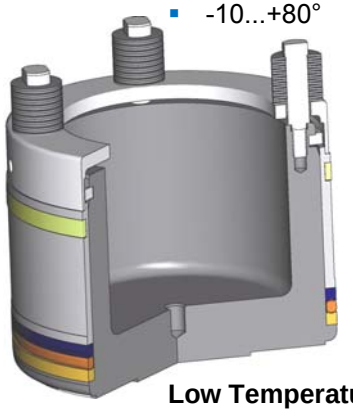
Single Point Sealing System

	piston (Ø ≤ 180)
▪ 0,8 m/s	max. piston speed
▪ HLP	allowed fluid
▪ 0...350bar	max. pressure
▪ -10...+80°	allowed temperature range



Double Point Sealing System

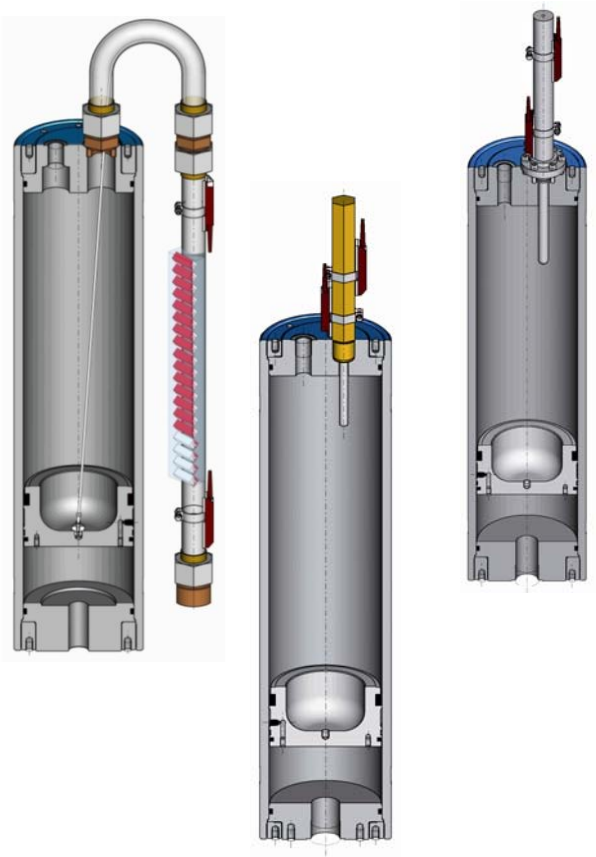
	piston (Ø ≤ 180)
▪ 2,5 m/s	max. piston speed
▪ HLP	allowed fluid
▪ 0...350bar	max. pressure
▪ -10...+80°	allowed temperature range



Low Temperature Sealing System

	piston (Ø ≤ 250)
▪ 2 m/s	max. piston speed
▪ HLP	allowed fluid
▪ 0...350bar	max. pressure
▪ -60...+80°	allowed temperature range

PISTON POSITION MONITORING

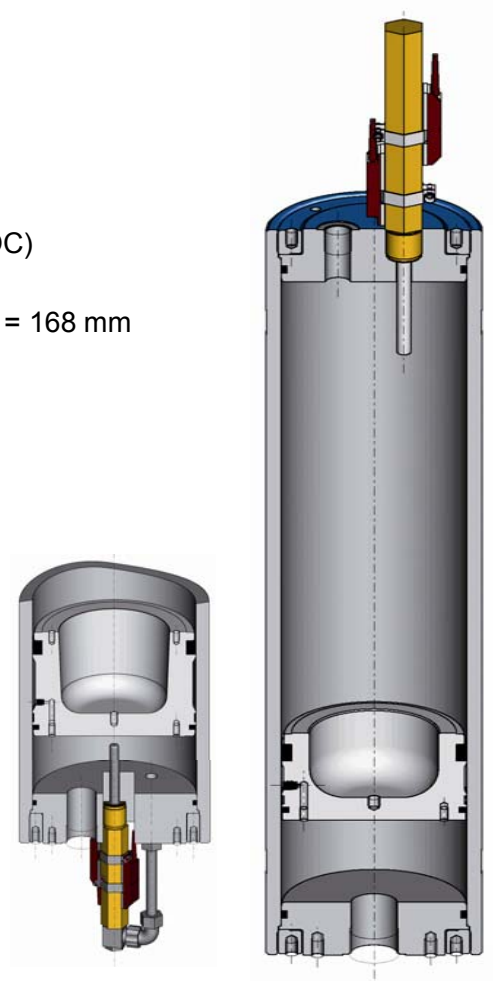


5 **Optionally available BSD piston accumulator control systems, tried and field tested:**

- Limit switching devices
- with or without stroke limiters
- Electronic read out via cable sensors
- Ultra-sonic sensor systems

ELECTRICAL LIMIT SWITCHING DEVICE "ES"

- stroke 75 mm with on brake contact (NCC) and one open contact (NOC) overall length L = 250 mm
- stroke 50 mm with one (NCC) or one (NOC) including, overall length L = 168 mm
- spring reset for any required installation position
- special design for oil side with additional bypass tube for pressure balance, overall length on request
- optional in Ex-version ATEX category 2, zone 1 or 21 available
- cable length 5000 mm, others on request
- working temperature -10 ... +75°C
- design pressure 375 bar (5500 psi)
- piston speed "accumulator charging" should not exceed 0,5 m/s

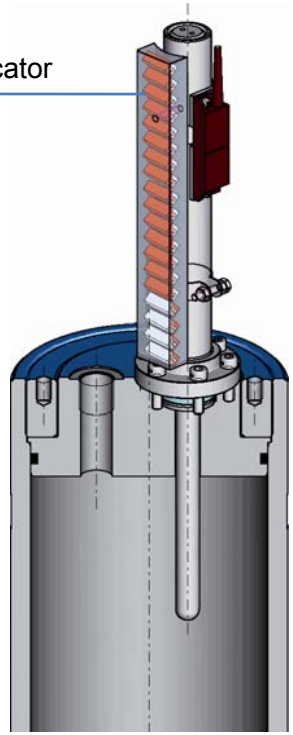


ELECTRICAL SWITCHING DEVICE “SV"

- length of stroke to be controlled up to the complete piston stroke but max. up to 1.500 mm
- above 1.500 mm stroke only in special design for the complete piston stroke
- overall length L = stroke + 123 mm
- for vertical installation only, gas side on top
- limit switches as bistable contacts; Number of limit switches as required
- optional in Ex-version ATEX category 2, zone 1 or 21 available
- can be added with a visual monitoring device (type "SV-M") or an analog measuring instrument (type "SV-B")
- cable length 5000 mm, others on request
- working temperature -10 ... +75°C
- design pressure 375 bar (5100 psi)
- piston speed "accumulator charging" should not exceed 0,5 m/s

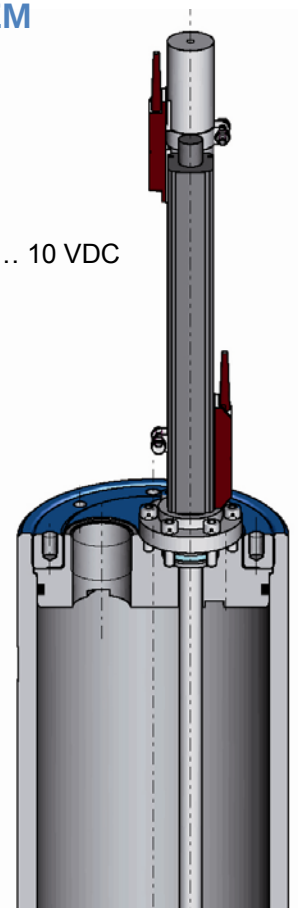
Advantage
The stroke area which is required to be controlled can be up to 1 500 mm chosen independently of the total piston stroke. Normally it is enough to monitor 50 % of the stroke.

ELECTRICAL SWITCHING DEVICE "SV-M" VISUAL MONITORING



ELECTRICAL SWITCHING DEVICE "SV-M" ANALOG SYSTEM

- stroke measuring device
  analog signal 4 … 20 mA or 0 … 10 VDC

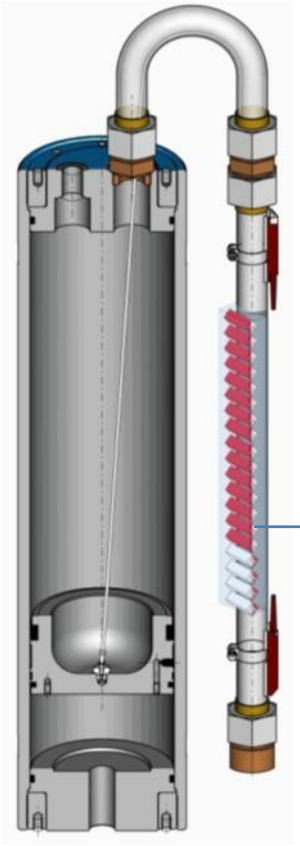


ELECTRICAL SWITCHING DEVICE “SV-G“ BENDED DESIGN

- control of the complete piston stroke
- for vertical installation only with gas side on top
- limit switches as bistable contacts; number of limit switches as required
- cable length 5000 mm, others on request
- working temperature -10 ... +75°C
- design pressure 375 bar (5100 psi)
- piston speed "accumulator charging/discharging" should not exceed 0,5 m/s

Advantage
The complete stroke of the piston can be controlled with small required space.

ELECTRICAL SWITCHING DEVICE “SV-GM“ VISUAL MONITORING BENDED DESIGN

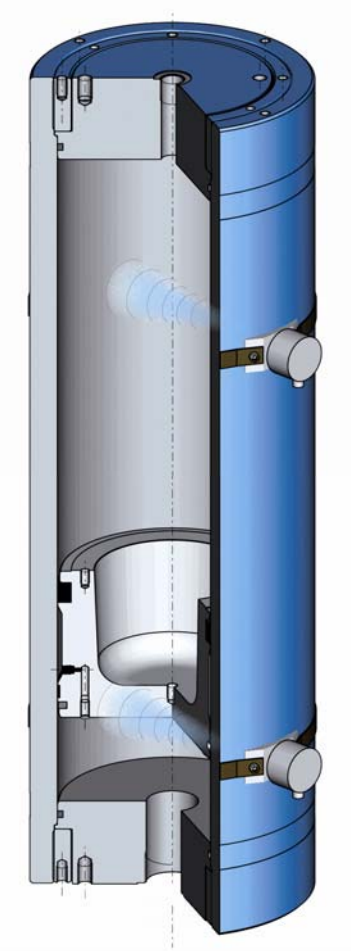


magnet-flip-indicator

ELECTRICAL SWITCHING DEVICE "SV-GB" ANALOG SYSTEM BENDED DESIGN

- stroke measuring device
  analog signal 4 … 20 mA or 0 … 10 VDC

ULTRASONIC POSITION SENSOR "UPS"



- BSD piston accumulator could work in every required installation position
- sensor position arbitrary, installation afterwards possible
- less place requirement
- hydraulic fluid viscosity 15 ... 100 cSt
- operating & storage Conditions -20 ... +80°C
- ambient temperature:-20 ... +60°C
- power supply 18 ... 30 VDC
- switching output NPN or PNP, switches against negative operating voltage [GND] (max. 60 mA by max. 30 VDC)
- connection sensor-plug connector M12

PISTON ACCUMULATOR MEASURING SYSTEM "KME"

- A) electronic measuring cable-sensor
- only for vertical accumulator installation, gas side on top, horizontal installation is possible for short measuring length
- operating temperature -20 ... +85°C
- working pressure max. 350 bar (5100 psi)
- piston speed max. 1 m/s
- piston acceleration max. 5 g
- not suitable for high frequency short stroke operation and high stress cycles

- B) measuring transducer (switch cabinet integration)
- voltage supply 21,6 ... 253 VAC as well as 19,2 ... 300 VDC
- output signal 4 ... 20 mA or 0 ... 10 VDC
- piston monitoring position optional in liter, percent or stroke
- 2 freely selectable switch-points optionally
- front display demountable

alternative:

- C) measuring transducer (switch panel integration)
- voltage supply: 21,6 ... 253 VAC as well as 19,2 ... 300 VDC
- output signal: 4 ... 20 mA
- piston monitoring position optional in liter, percent or stroke
- inclusive 2 freely selectable switch-points

ULTRASONIC RUNNINGTIME MEASSURING-SYSTEM "ULM"

- BSD Piston Accumulator with ultrasonic-runtime measuring-system
- electronic control and monitoring device
- operating temperature -20 ... +60°C
- maximum Measuring Distance approx. 5000 mm
- pressure resistance max. 500 bar (7250 psi)
- usable for different fluids
- less place requirement
- BSD piston accumulator installed in any position
- voltage supply 24 V (18 ... 30 VDC)
- output signal 4 ... 20 mA
- inclusive 4 freely selectable switch-points