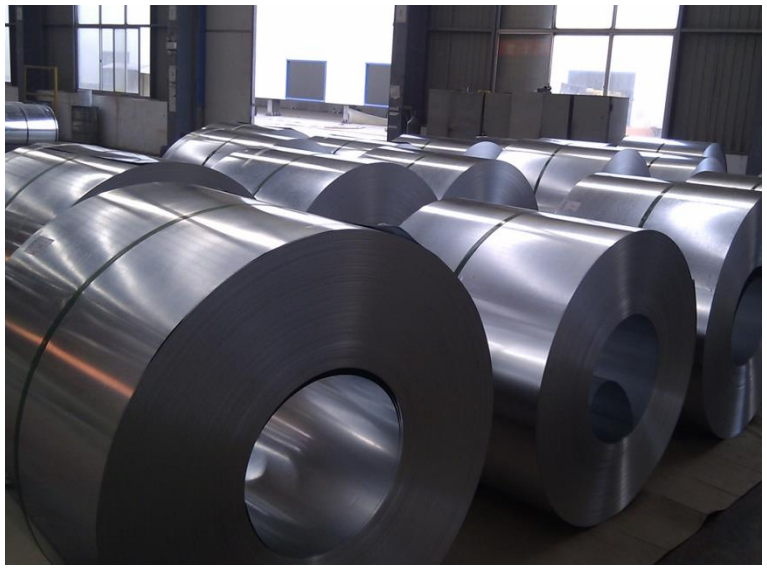
PROCESS PUMPS

Oil & Gas



Steel

Chemicals

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Company Overview

Hammelmann GmbH

Founded 1949

Located in Oelde, Germany

Company in the Interpump Group

EURO 95 Million turnover

370 Employees in Oelde

65 % Export share

40 Agents worldwide

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

SIHM HØJTRYK

HAMMELMANN®

DAUGHTER COMPANIES

USA / Dayton

China Tianjin

Spain / Saragossa

Brazil / Sao Paulo

Australia / Melbourne

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

INDUSTRIES

Hammelmann process plunger pumps are used in the production of:

- Chemicals
- Cosmetics
- Fats and oils
- Fibres
- Food and drink
- Oil and gas (extraction)
- Petrochemicals
- Pharmaceuticals
- Plastics
- other

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Process Pumps

Typical fluids are:

- Aggressive water
- Amine
- Carbon dioxide
- Corrosion inhibitor
- Crude oil
- Diesel oil
- Ethanol
- Glycol
- Glycol /Water
- Hot water
- Hydraulic oils
- Hydrocarbons
- LDHI
- Methanol
- Produced water
- Salt water
- Scale inhibitor
- Wash water
- Water based oil
- Xylene

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PERFORMANCE RANGE

Flow rates	to	180 m³/h
	to	47,000 gph
	to	3000 l/min
	to	790 gpm
Op. pressures	to	3800 bar
	to	55,000 psig
Power ratings	to	1100 kW
	to	1500 HP
Viscosities	0,1 to 2000 mPas	
Fluid temperatures	-40 to + 200 °C	
	-40 to + 392 F	

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Pump program – HAMPRO (HAMmelmann PROcess)


HAMPRO 20

HAMPRO 40

HAMPRO 70

HAMPRO 140

HAMPRO 200

HAMPRO 300

HAMPRO MC

HAMPRO 800

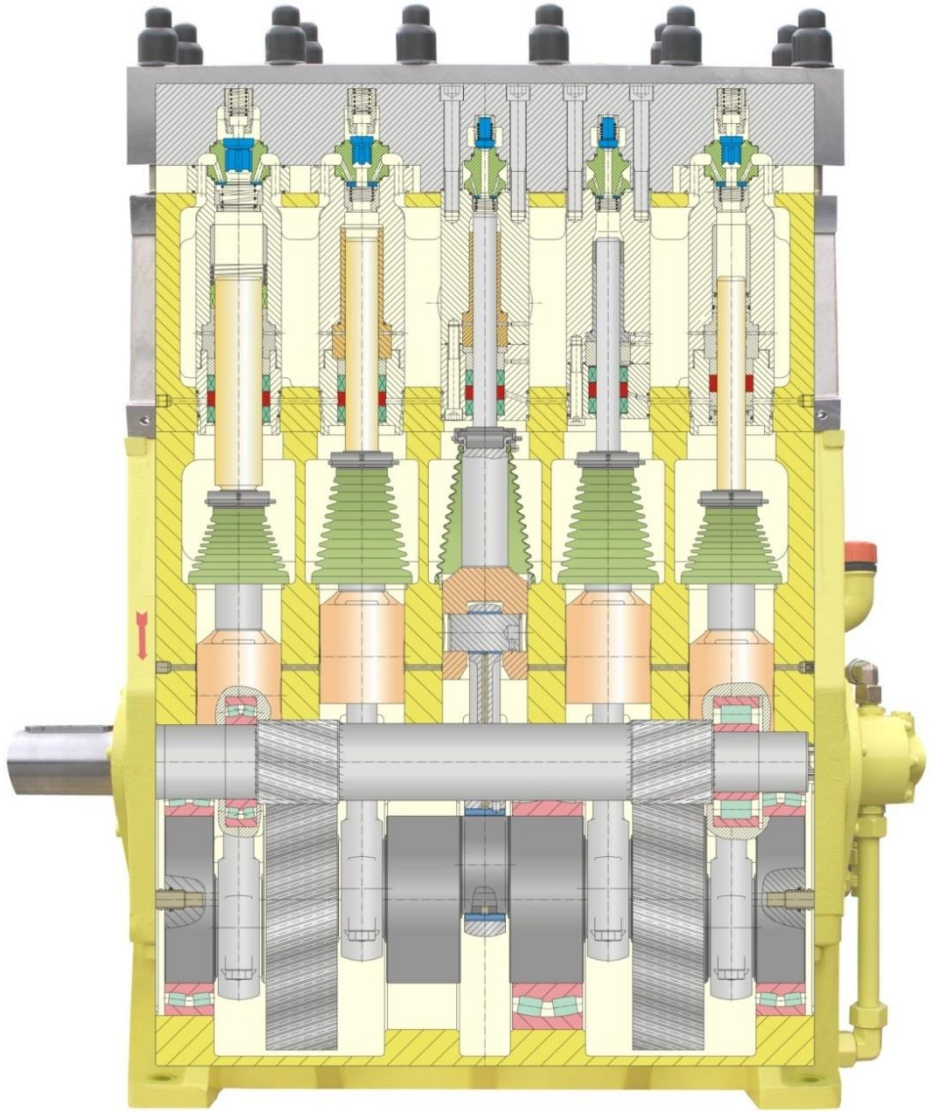
HAMPRO 500

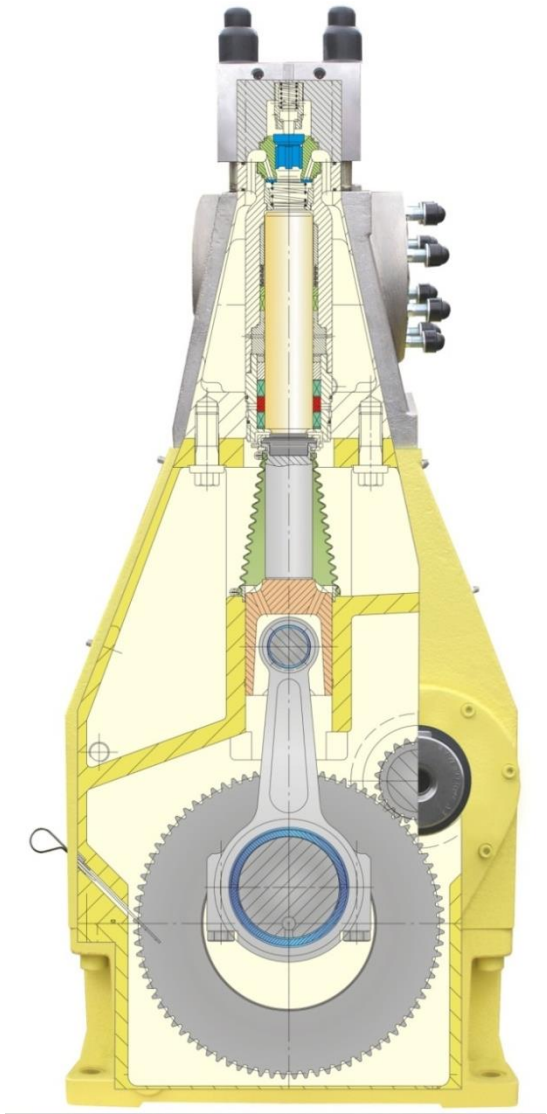
HAMPRO 400

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Cross Sectional View





- **<u>Vertical</u> plunger pump**
  with 3, 5 or 7 plungers depending on pressure and flow requirements.

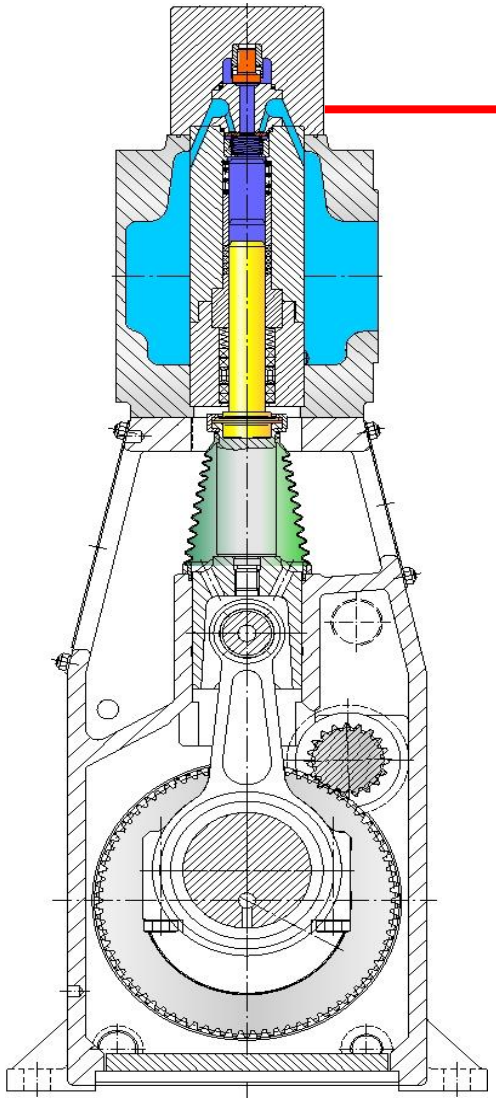
  <u>internal</u> speed reduction gear to reduce motor speed (e.g. 1500 rpm) to crank speed (e.g. 400 rpm)
  - **<u>no external gearbox</u>.**

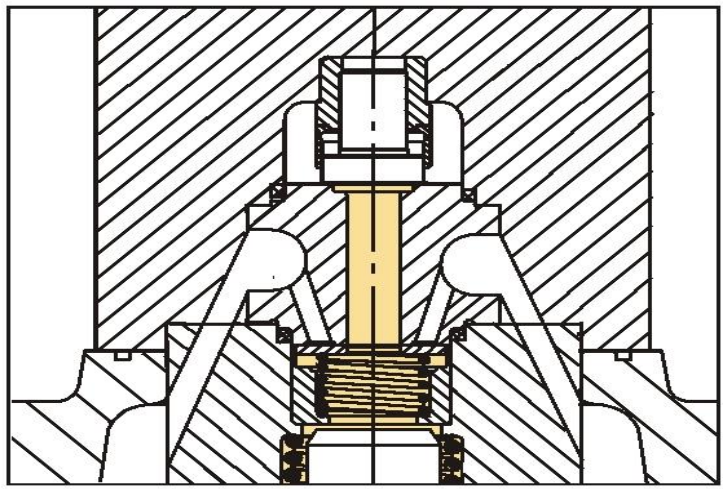
  Hammelmann pump provides high power combined with excellent efficiency on a **<u>small footprint</u>**.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Pump Head





- No alternating stress
- Fatigue cracking eliminated
- Parts continuously loaded and unloaded are rotationally symmetrical

clearance volume

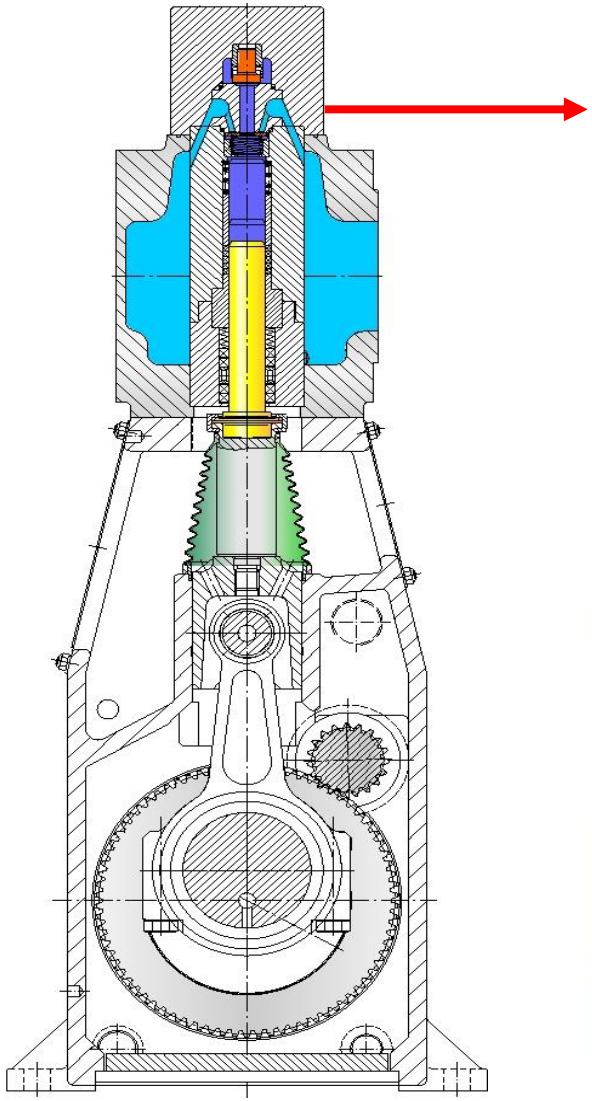
- **Design features**

  The valve block is not subjected to alternating stress and therefore not sensitive to cracking by low cycle fatigue.

  A minimum clearance volume (dead area) results in low pulsation and high volumetric efficiency.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Pump Valves



- **Valve options**

  Hammelmann offers two different valve options.

  Flat type inlet valve and conical outlet valve for applications with low inlet pressure.

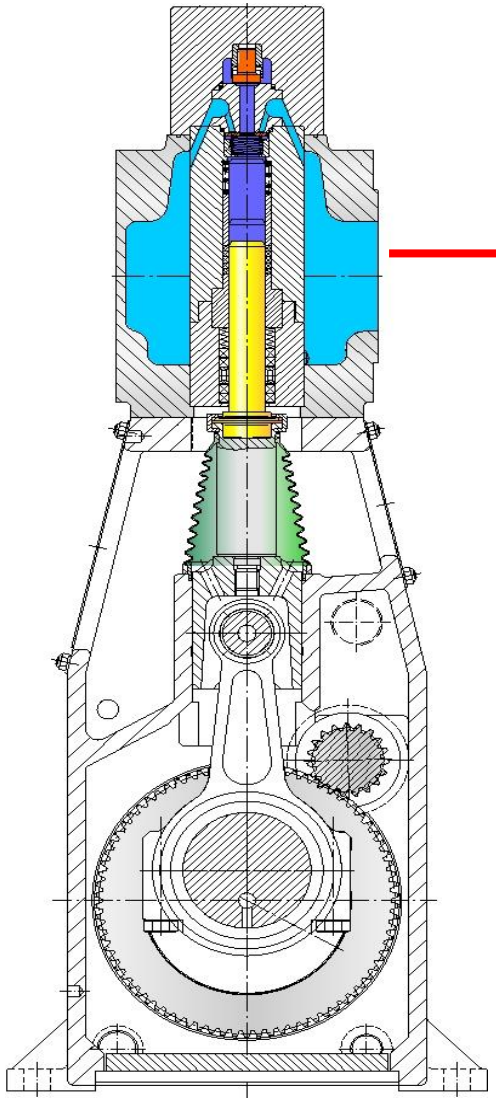
  Both conical valves for fluid having particles.

  There is one common valve seat ring for both parts.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

SUCTION CHAMBER



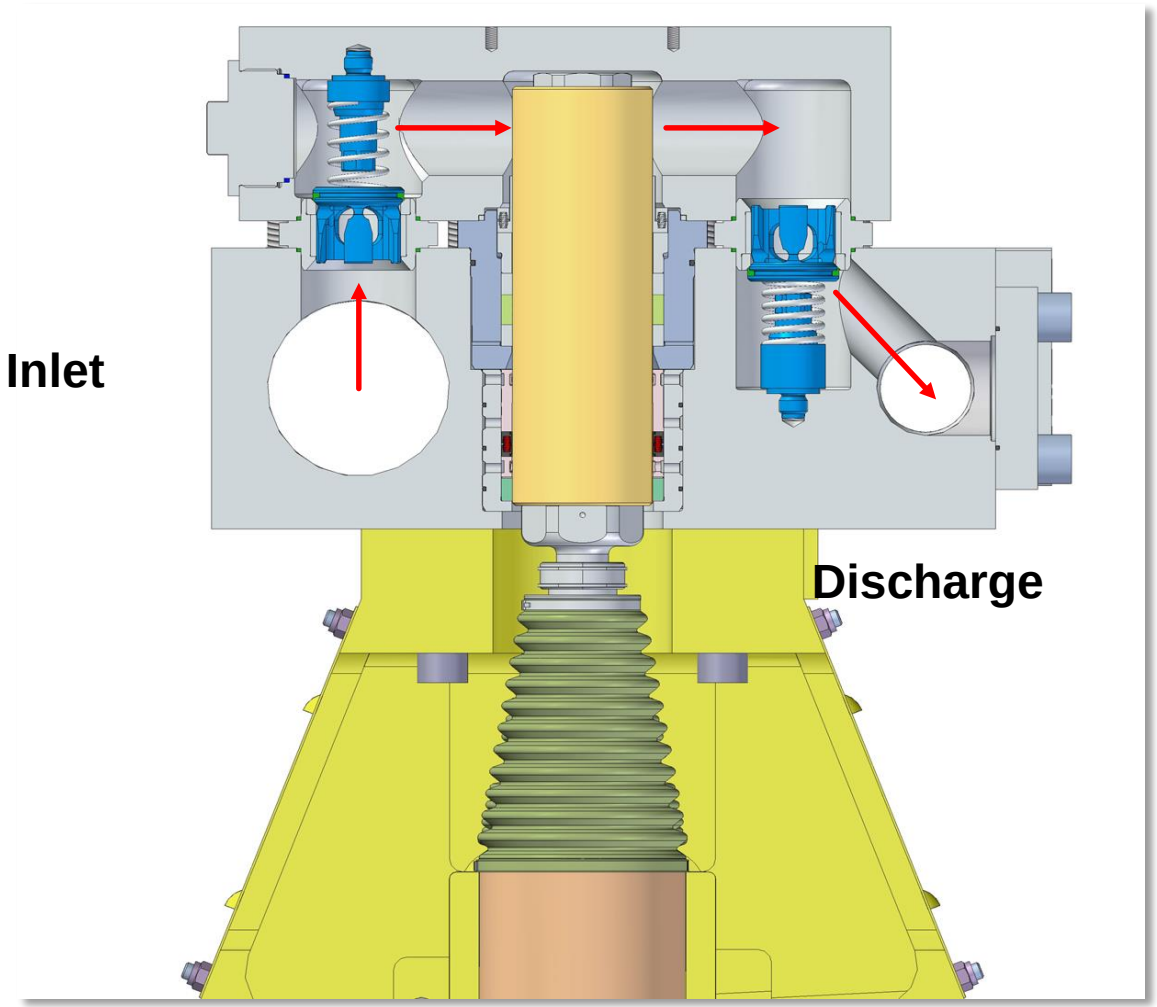
Suction chamber

- Pressure loaded components encapsulated in the suction chamber
- Medium cannot escape to atmosphere
- No uncontrolled leakage
- High pressure leakage directed back into the suction chamber
- Fluid cooled high pressure seals

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Pump Head – High Flow Design



- **Design features**

  For high flow and medium pressure application up to 370bar.

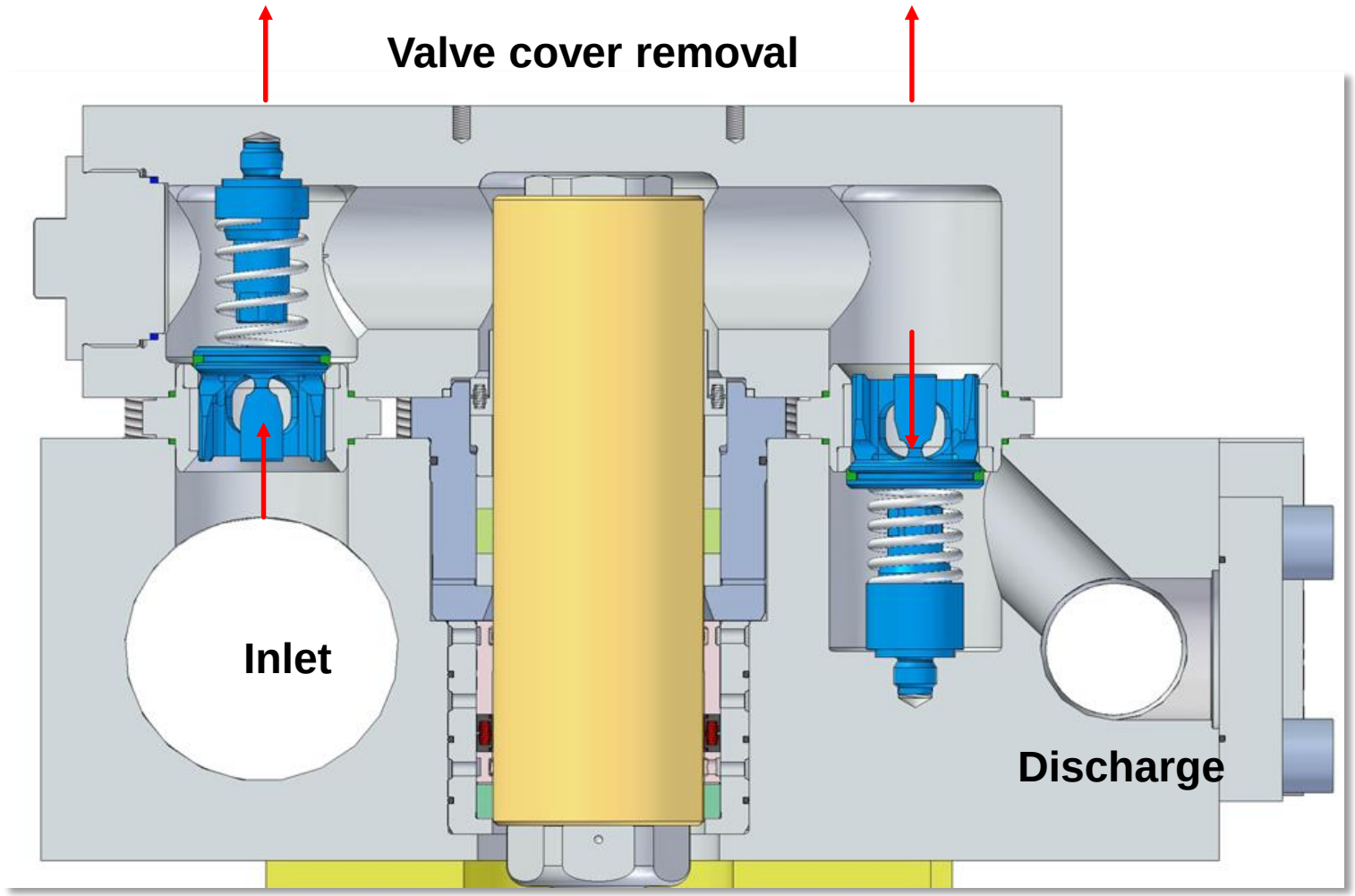
  Assembly for maintenance easily possible from the top for each cylinder.

  The valve assembly for suction and discharge side can be changed with the same parts (except the spring coil).

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Pump Head – High Flow Design



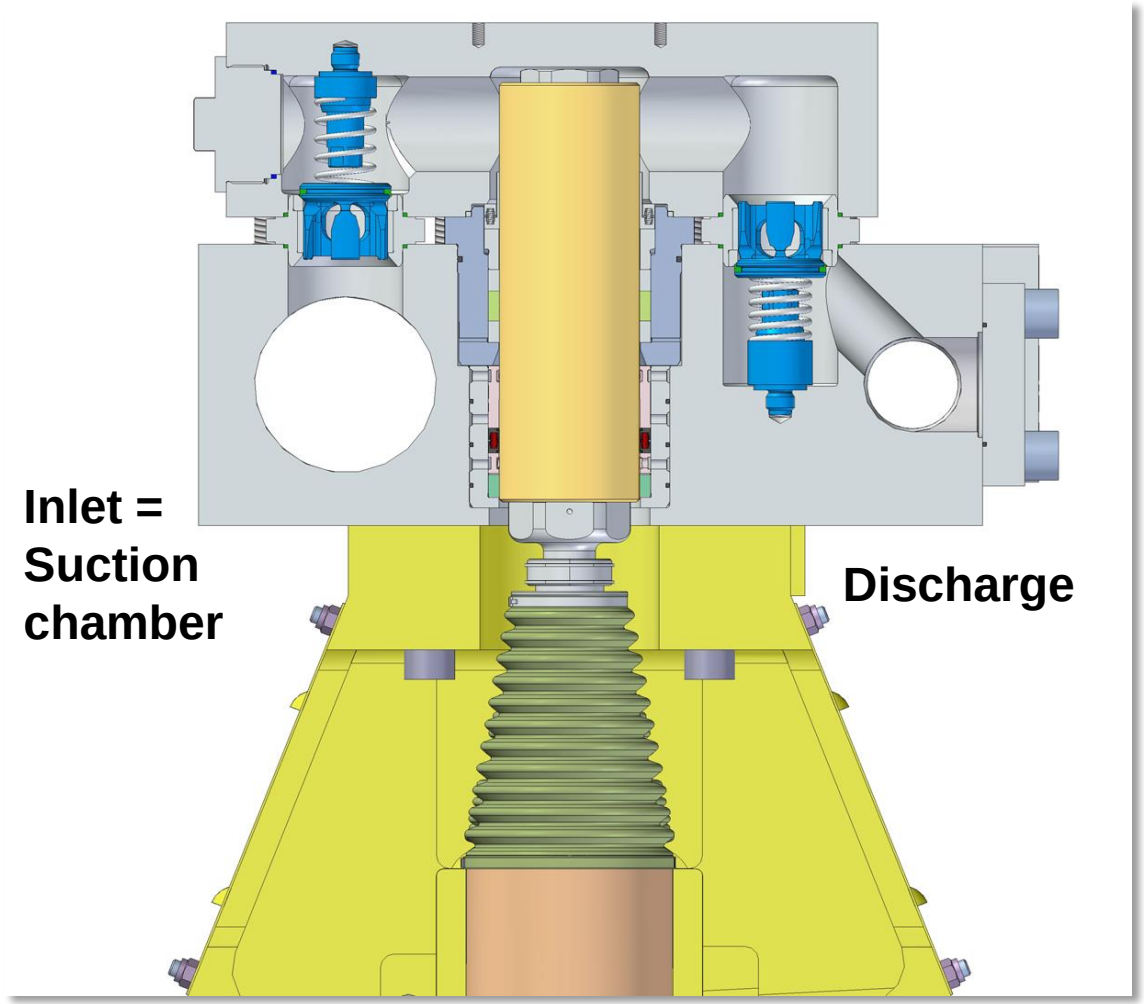
- **Design features**

  Conical valves in four foot design for continuously movement of valve on valve seat ring (prevention of wear on seat ring).

  Easily removal of valve cover for maintenance from the top.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

SUCTION CHAMBER – HIGH FLOW HEAD

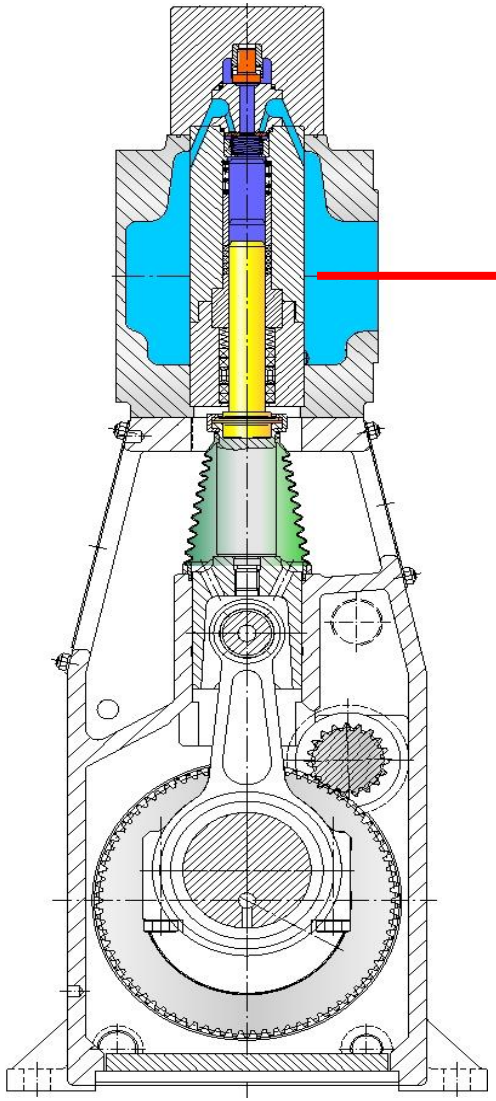


- **Design features**

  Integrated in the pump head, no additional part.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PISTON SEAL ASSEMBLIES



Sealing designs

Labyrinth seal

- No seal collars or packings on the high pressure side
- Extended service life
- Long intervals between planned maintenance tasks
- Choice of plunger materials
- Self centering plunger connections

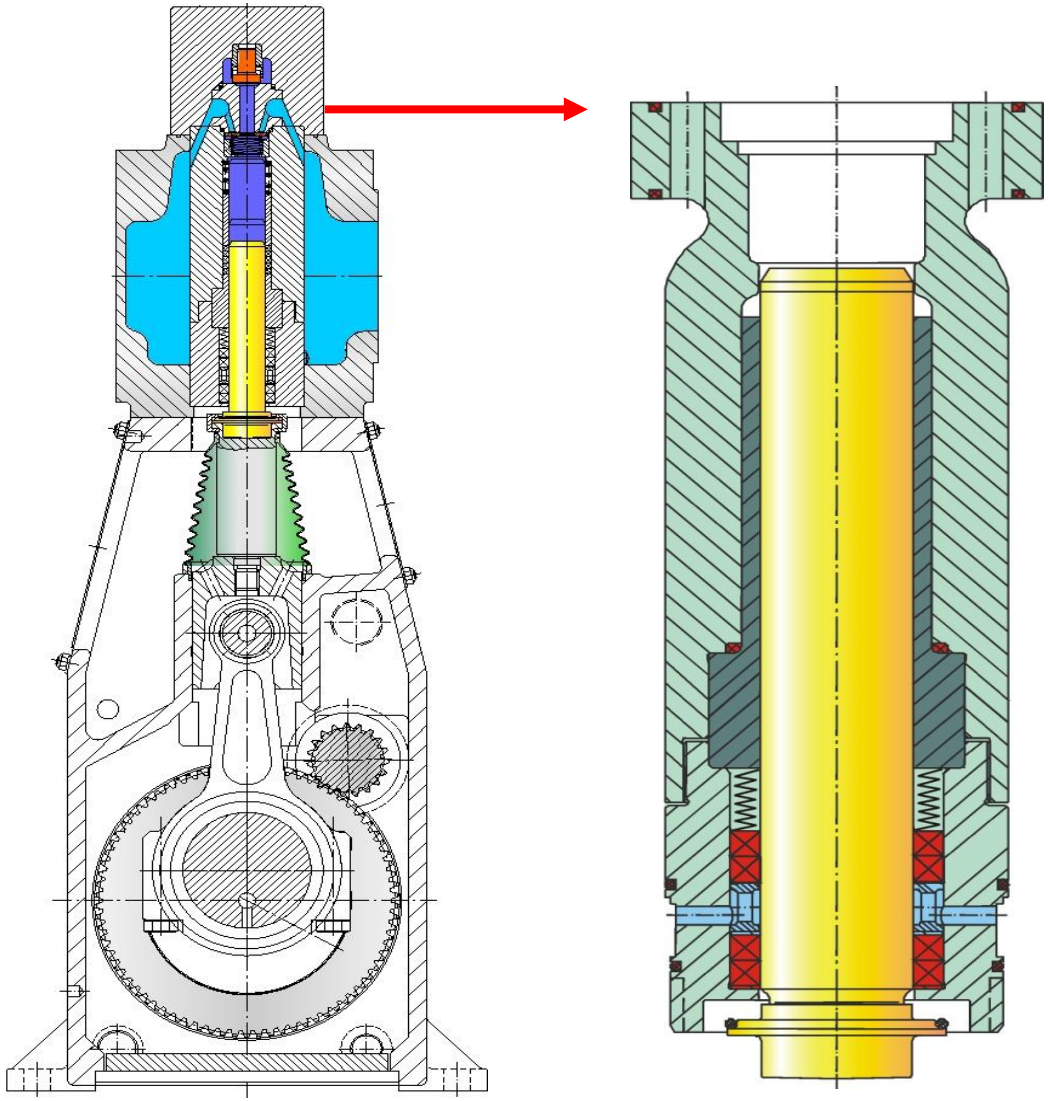
Packed seal

- Resistant to dirt and abrasives

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Labyrinth Plunger Seal



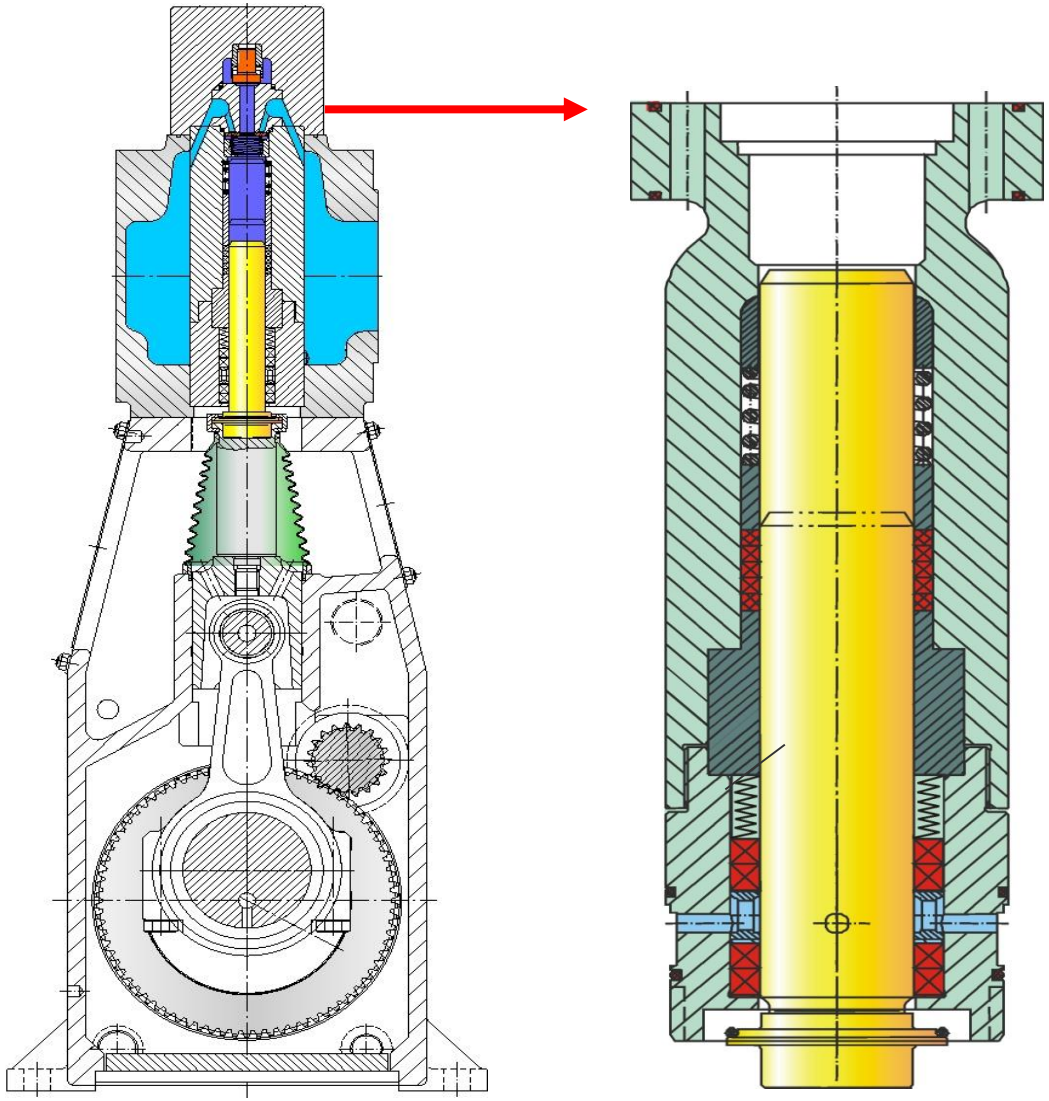
- Leakage is fed back to the pump suction chamber
- Life time up to 5 years continuous duty
- Operating pressure
  up to 4000 bar
  up to 58,000 psig

- Labyrinth
- Seals
- Pressure loaded parts
- Plunger
- Barrier fluid

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Packed Plunger Seal

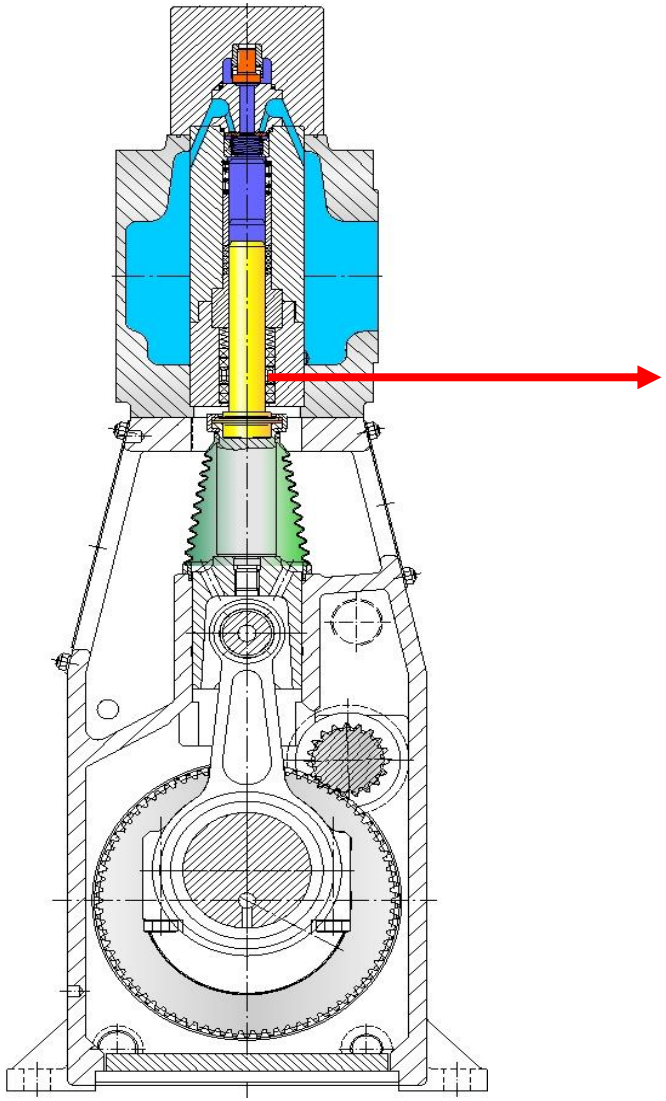


- Operating pressure
  up to 1200 bar
  up to 17,400 psig
- For abrasive or corrosive fluids
- Self adjusting packings

- Bush
- Seals
- Pressurised parts
- Plunger
- Barrier fluid

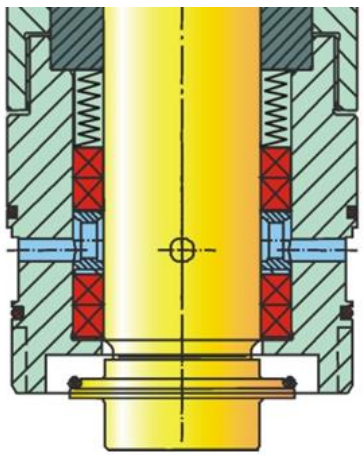
SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Low Pressure Plunger Seal



Low pressure sealing

- Spring loaded seal pack
- Lantern ring for cooling, flushing or leakage monitoring (only used in special applications)



Plunger

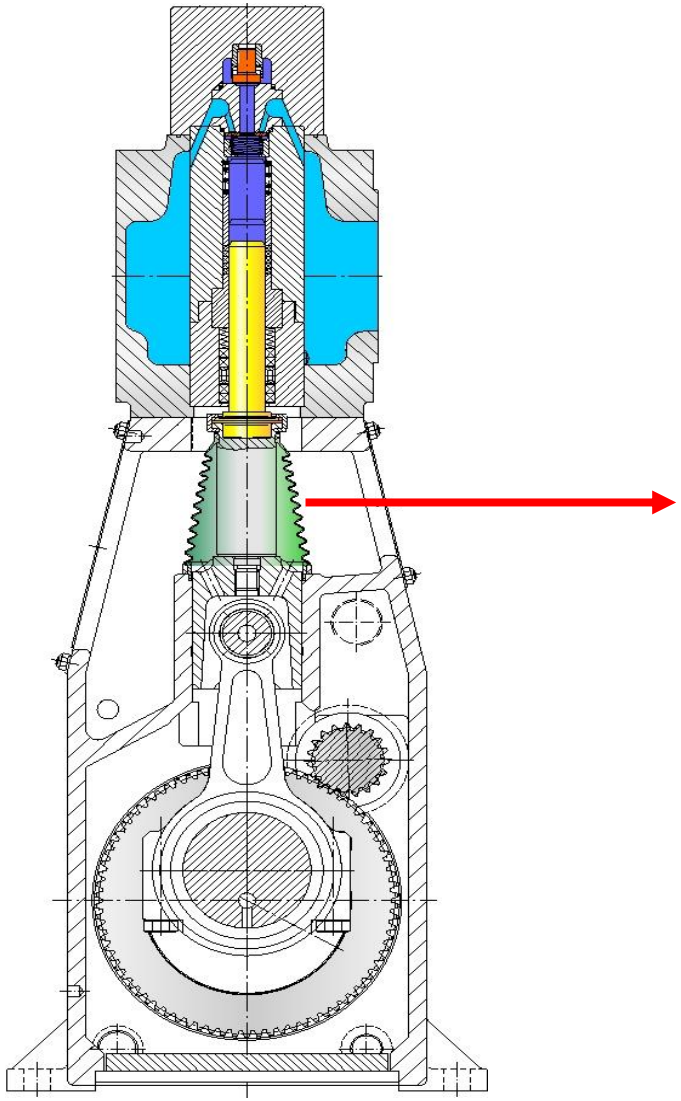
Bushing

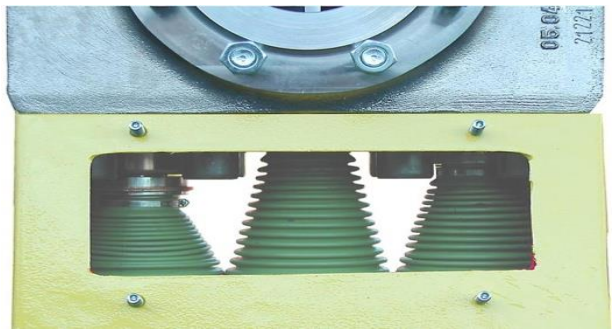
Seals

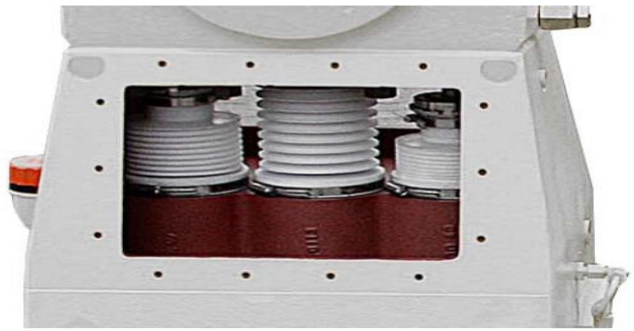
SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

BELLOW SEAL





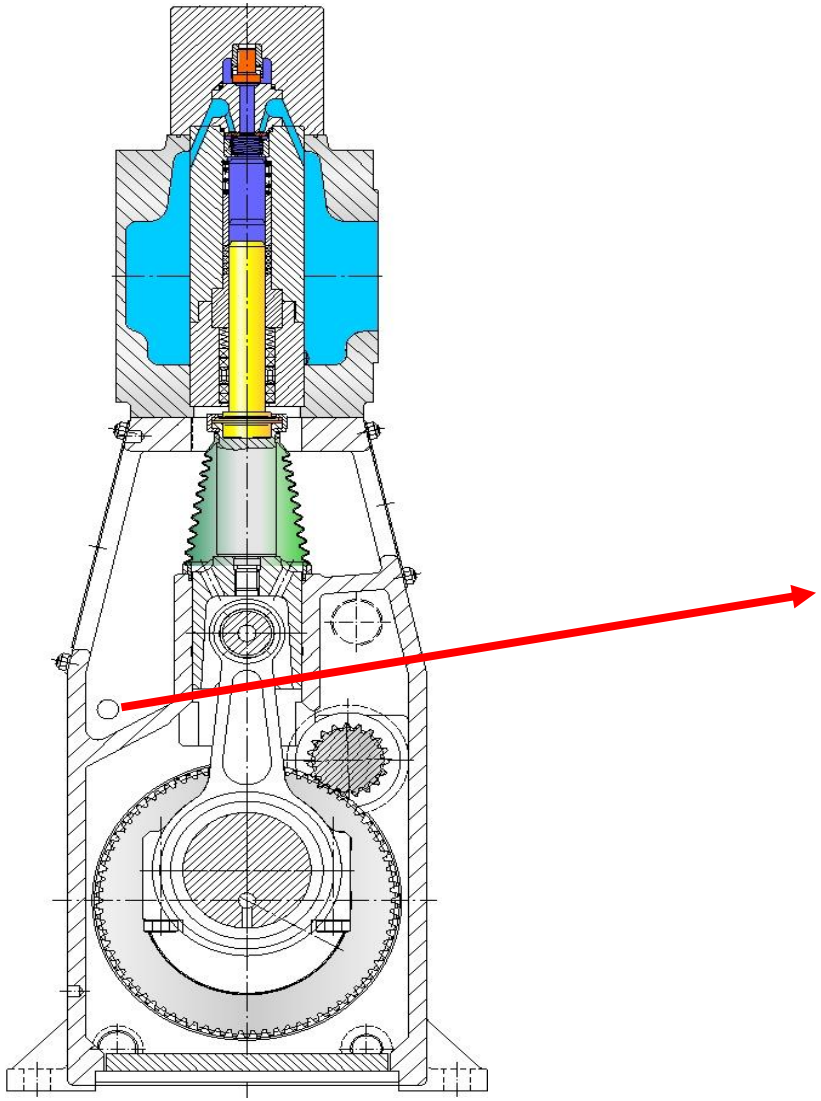


- Forms a hermetic seal between suction chamber and crank section
- Prevents fluids and gases entering the crank section
- Available with Viton/FKM, Nitrile rubber or PTFE material

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Low Pressure Plunger Seal



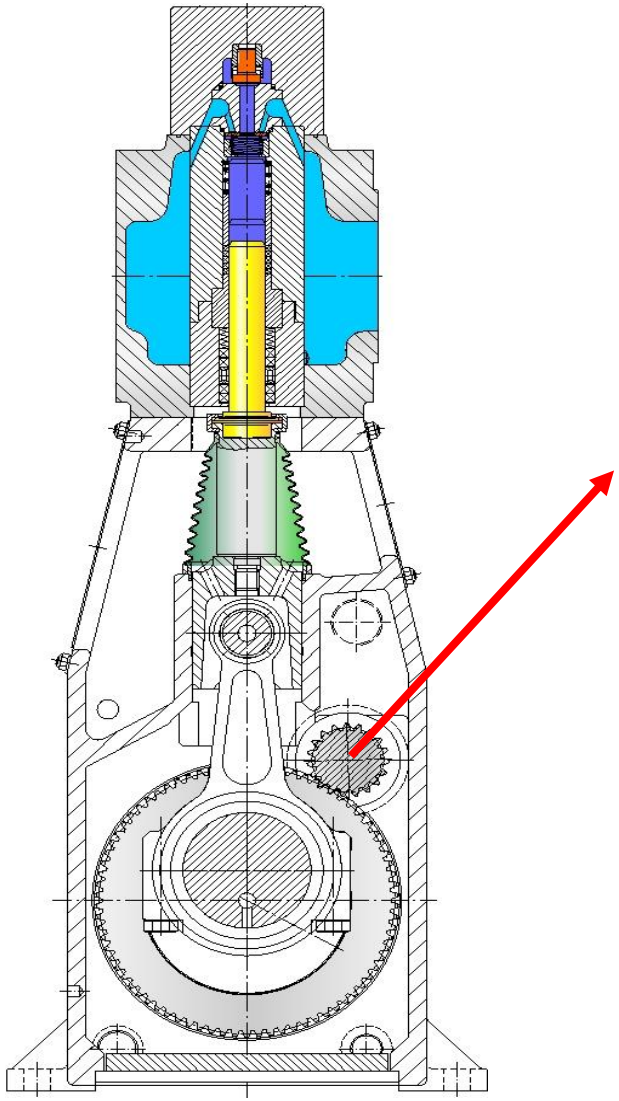
Drainage point

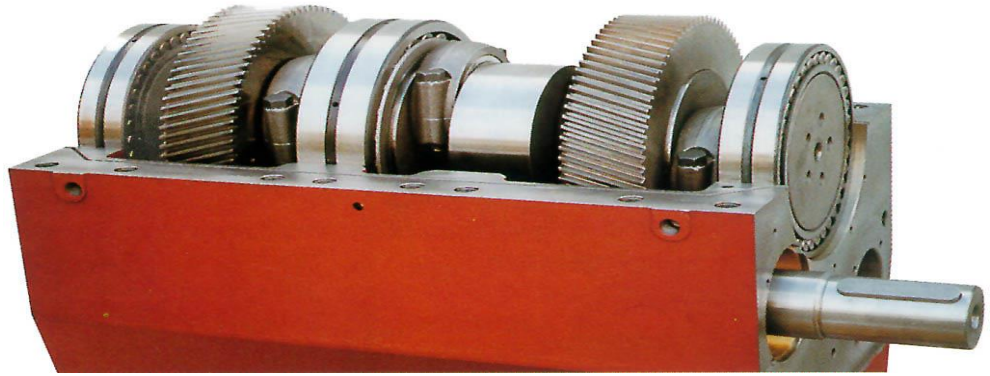
- To drain off leaked fluids from the intermediate chamber
- Can be used for leakage indication

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Internal Speed Reduction Gear



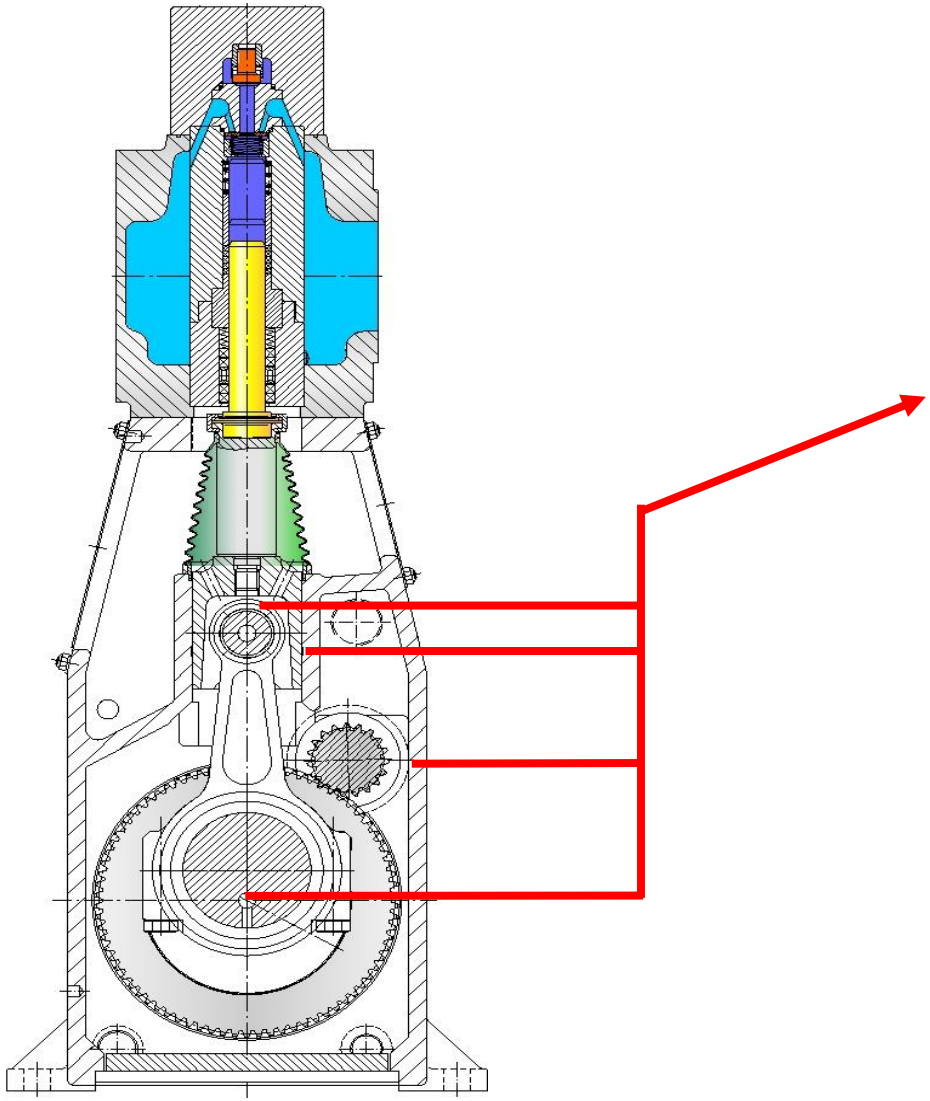


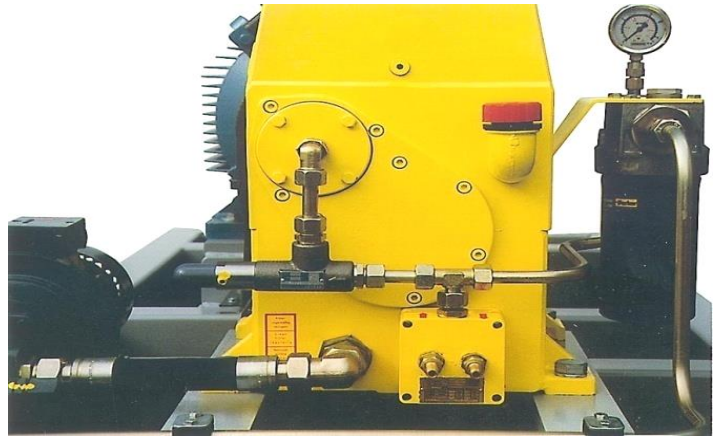
- Pressurised oil lubrication system (pump, filter, cooler)
- Helical gears in herringbone configuration
- Drive shaft supported by 2 bearings
- Heavy duty crankshaft bearings
- Compact design
- Mechanical efficiency > 95 %

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Hammelmann pump design

Pressurized Oil Lubricating System





- Forced lubrication of all rotating and sliding components
- Maximum operational safety
- Even temperature distribution

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

TECHNICAL FEATURES

Reliability

- Low plunger speed; API requirements considered
- Wear and corrosion resistant materials used for all wetted components
- Choice of ceramic or tungsten carbide plungers
- Low medium velocity in the suction and discharge valve sets
- Vertical configuration eliminates uneven, one sided wear on plungers and valves

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

TECHNICAL FEATURES

Safety

- No uncontrolled leakage to atmosphere
- Hermetic piston rod seal
- Guided leakage via flushing or gas tight barrier chamber
- Stress free pump head
- All pressure pulsation loaded components encapsulated within the suction chamber

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

TECHNICAL FEATURES

Smooth operation

- Low pulsation due to minimum of stressed area
- Choice of triplex, quintuplex or septuplex designs
- Vertical configuration eliminates side to side unit oscillation

High efficiency

- Minimal “dead“ area in pumphead
- 95 % to 98 % volumetric efficiency
- 95 % mechanical efficiency

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

TECHNICAL FEATURES

Small footprint

- Integral speed reduction gearbox
  no additional gearbox needed for pumps
  bigger HAMPRO 40
- Less weight due to compact design
- Vertical configuration = compact footprint

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

TECHNICAL FEATURES

Reliability

- Low plunger speed
- Wear and corrosion resistant materials used for all wetted components
- Choice of ceramic or tungsten carbide plungers
- Low medium velocity in the suction and discharge valve sets
- Vertical configuration eliminates uneven, one sided wear on plungers and valves

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN THE CHEMICAL INDUSTRY

Applications in the Chemical industry

- Hydrocarbons
- Ester
- Fatty acids
- Agressive waste water
- Fats and waxes
- Vinyl acetate
- etc.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN THE CHEMICAL INDUSTRY

HDP 165
Methylester, Methanol
185 l/min, 250 bar

Fatty acid process

Chemical industry

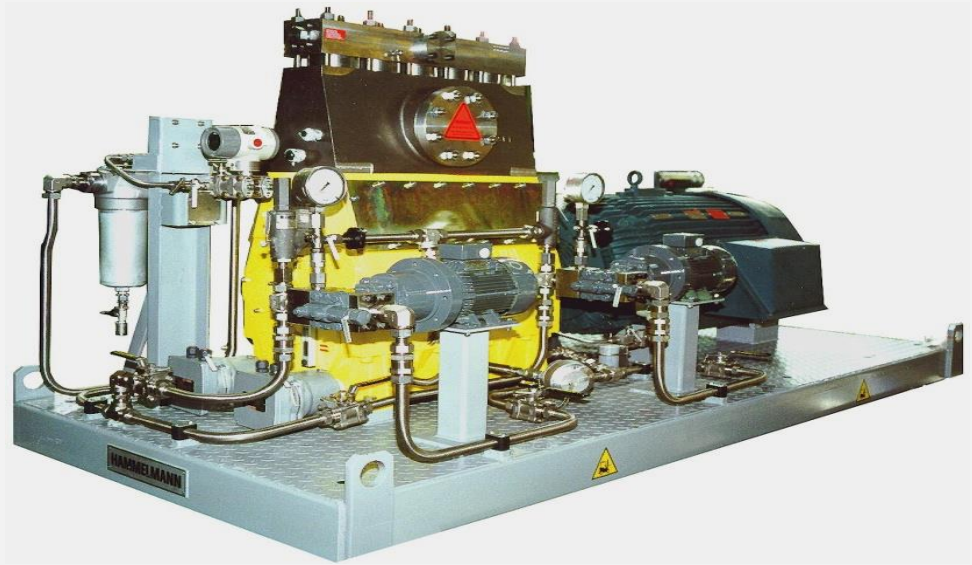
HDP 255
Methyl Ester
for Methyl Ester and Fatty Alcohol production plant
250 l/min, 285 bar

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN THE CHEMICAL INDUSTRY

HDP 555
Di-n-Butene
521 l/min, 325 bar

Chemical industy



HDP 235
Pentane
173 l/min, 410 bar

Hydrocarbons in various processes

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN THE CHEMICAL INDUSTRY

Chemical industry

HDP 255
Vinyl acetate
42 l/min, 2600 bar

HDP 75
Waste Water Treatment
1000 - 5000 l/h, 160 bar Medium temperature 90°C

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN THE CHEMICAL INDUSTRY

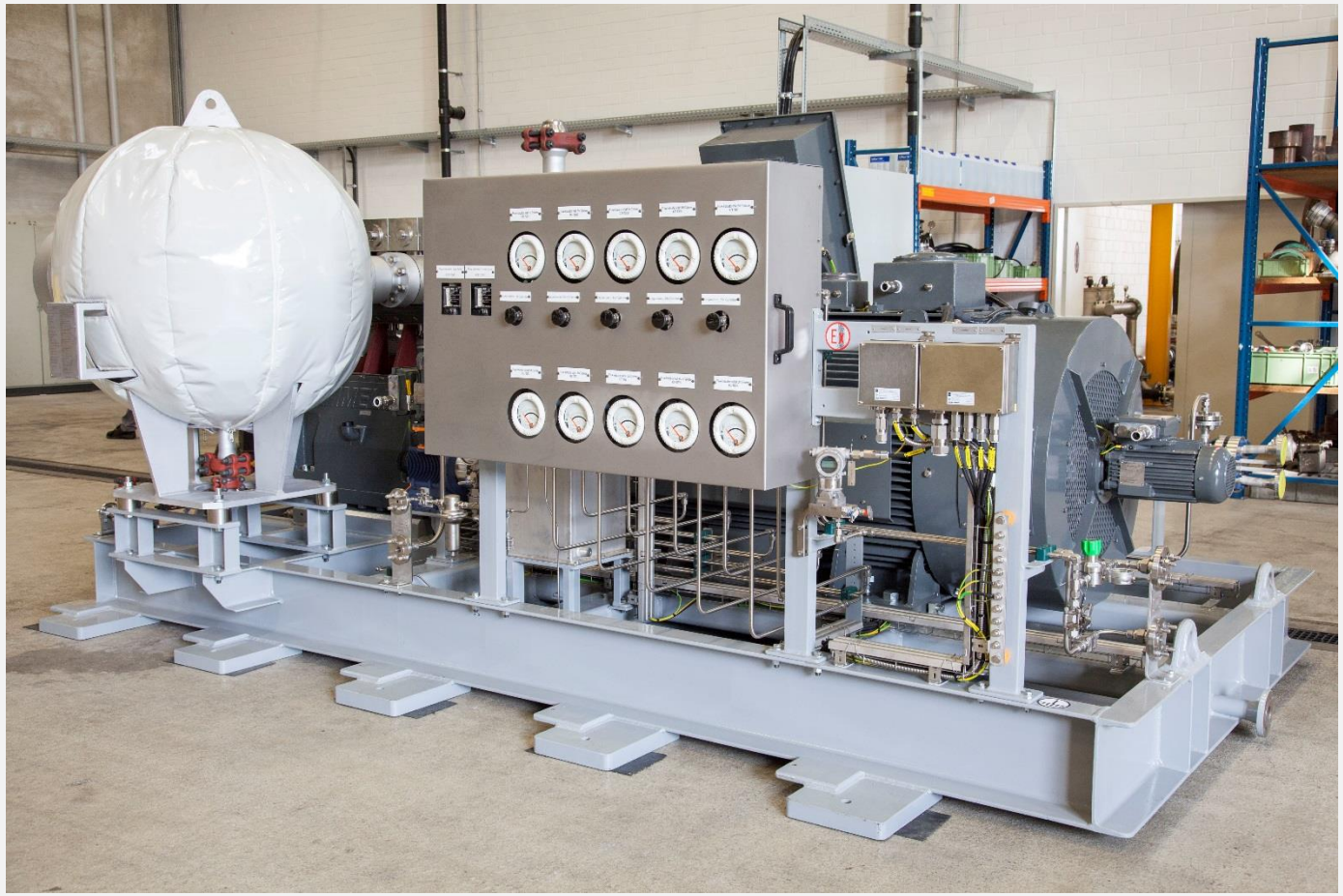
Nylon production

HDP 805

Liquid ammonia
390 bar, 580 l/min

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN THE CHEMICAL INDUSTRY



Solvent production

HAMPRO 805

Solvent
290 bar, 1000 l/min

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

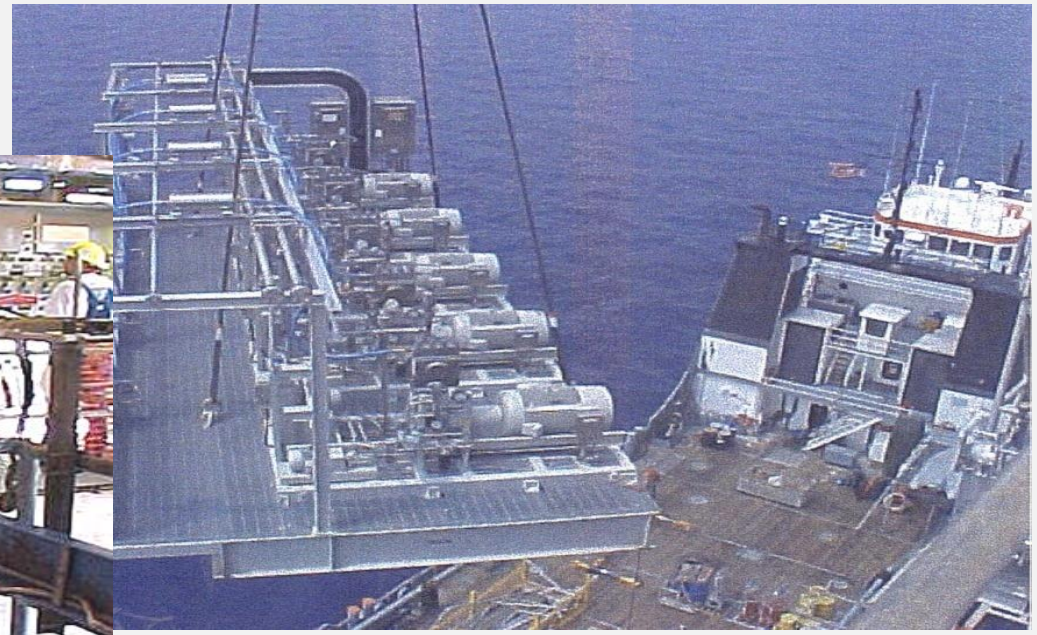
PUMPS IN OIL & GAS

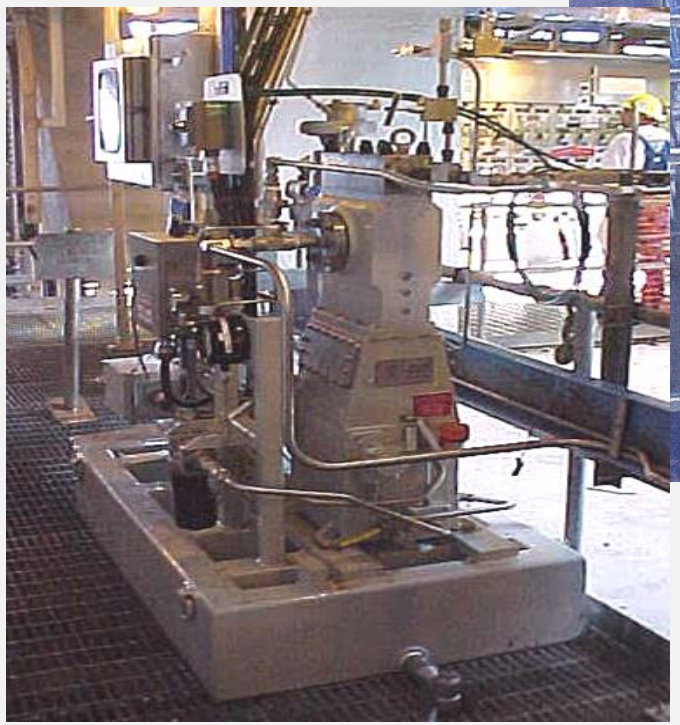
Applications in Oil & Gas

- Methanol
- Glycol
- Xylene
- LDHI
- Water based oils
- Produced water injection
- etc.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN OIL & GAS





Oil & Gas applications

Mexican Gulf

Injection pump set
HDP 165 for Methanol

HDP 115 for Methanol 6 l/min,
1035 bar

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN OIL & GAS

Oil & Gas applications

HDP 555

Scale squeeze liquids
740 bar, 334 l/min

North Sea platform
3 Injection pump sets
HDP 555 for Methanol

3 Injection pump sets
HDP 555 for Scale
Squeeze (Delutans)

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

Pumps in Oil & Gas

Salt Water and Crude Oil Injection Offshore

Installation on board an F.P.S.O. vessel.

3 x HDP 755 Sea Water Injection Pumps
1.384 l/min, 160 bar.
The processed water will be
pumped back down into the well.

4 x HDP 755 Crude Oil Pumps
555 l/min, 330 bar.

The pumps comply with API 674
and NACE regulations.

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN OIL & GAS

Water specification

ph-value	5,8
Chloride content	140.000 ppm
Temperature	70 °C

HDP 755, 1660 l/min, 210 bar
Process water / Salt water

Produced Water Injection Onshore

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN OIL & GAS

Water specification

ph-value	5,8
Chloride content	110.000 ppm
H_2S content	190 ppm
Temperature	65 °C

Produced Water Injection Onshore

HDP 755, 570 l/min, 430 bar
Process water

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN OIL & GAS

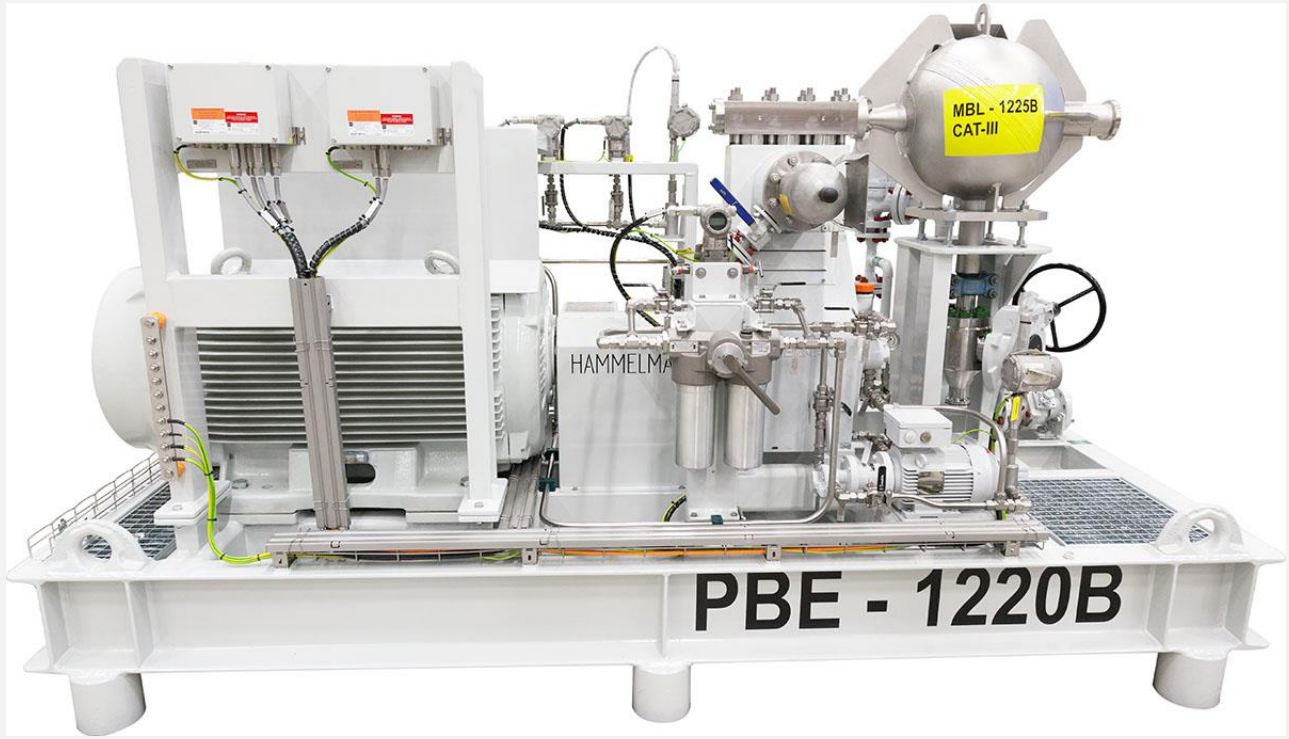
FPSO – Flowline circulation

HDP 805

Hot water / diesel
250 bar, 1020 l/min

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK

PUMPS IN OIL & GAS



FPSO – Flowline leak test pump

HAMPRO 172

Hot water / diesel
694 bar, 80 l/min

SIHM HØJTRYK A/S
GULDBORGSUNDVEJ 3
DK-6705 ESBJERG Ø - PHONE: + 45 75 15 97 00
SALES@SIHM.DK - WWW.SIHM.DK