nsb gas processing

# Liquid Ring Compressor

You favour inherently safer solutions avoiding hazards rather than controlling them. We have developed a new range of compressors.

## Catching Chemicals Conserving Cash

## NSB GAS PROCESSING LIQUID RING COMPRESSION SYSTEMS

nsb gas processing has been manufacturing liquid ring pumps and compressors for over 60 years. To comply with the specific requirements of the Petrochemical and the Chemical Process Industries a new range of liquid ring compressors has been developed, designed for those applications where heat sensitvity of the gas, explosion hazard or operational problems exclude the use of any other type of compressor or where maintenance costs and trouble free operation are important factors.

**DESIGN.** The compressor has been designed in compliance with the requirements of API 681. Two versions are available: single stage and two stage. The single stage compressors reach a discharge pressure of 5.5 bar the two stage units go up to 14 bar. Conical gas distributors permit large inlet gas passage openings, minimising capacity losses. To balance out the radial forces on the compressor shaft the machines are built in double acting construction.

The rotor is arranged overhung requiring only one shaft seal. The bearings are located in an externally accessible bearing housing and are grease lubricated. The rotor turns inside the casing without metal-to-metal contact minimising wear. The compressors are simple in design and sturdy in construction.

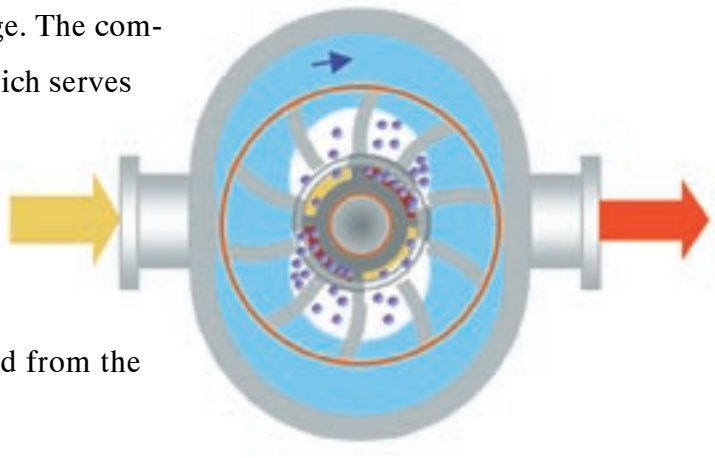
## CUSTOMER'S BENEFITS

- Virtually no gas temperature rise
- Low wear
- Reduced maintenance costs
- Reduced operation down time
- Investment cost savings
- High operation safety
- Low noise
- Environmentally friendly operation

**When to use nsb gas processing Liquid Ring Compressors**

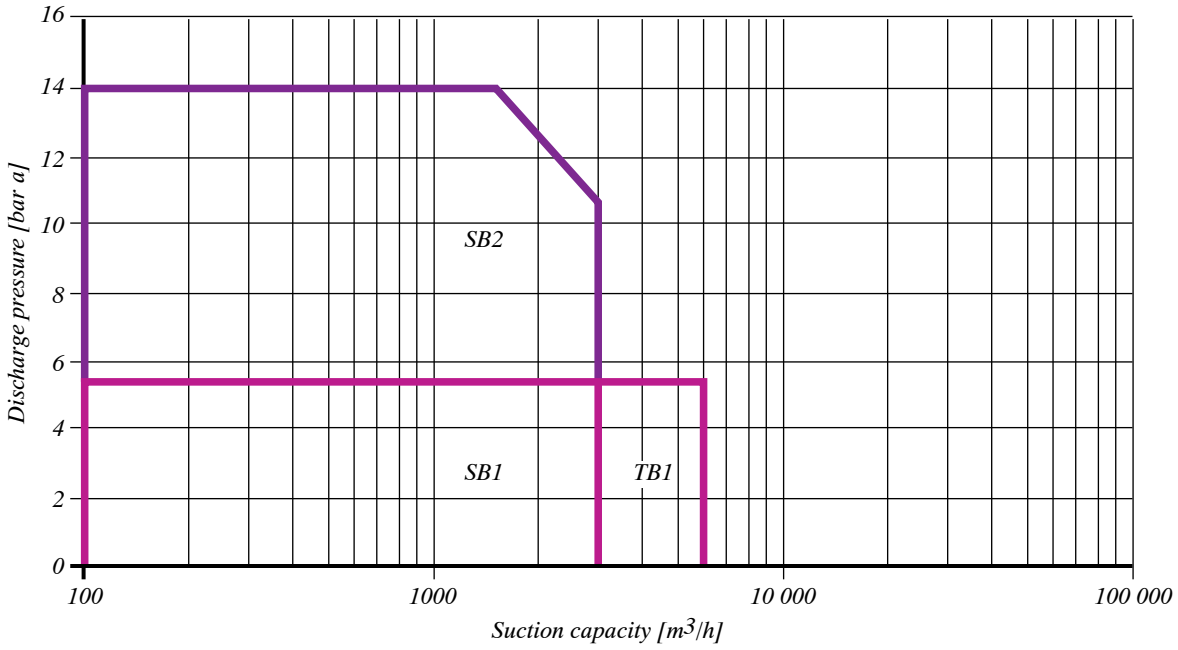
- For explosive gases
- When gases tend to polymerise or otherwise react under rising compression temperatures
- When oil free compression is required
- For vapour recovery applications
- For applications requiring tolerance to liquid carry over
- When gas scrubbing is desired
- For corrosive services

**WORKING PRINCIPLE.** The rotor is positioned centrally in an oval-shaped body. Upon rotation, which proceeds without metal to metal contact, a ring of liquid is formed which moves with the rotor and follows the shape of the body. At the two points of the nearest proximity of the rotational axis and body, this completely fills the chambers of the rotor and as rotation proceeds, it follows the contour of the body and recedes again, leaving spaces to be filled by the incoming gas. These spaces are connected via the cone porting to the inlet of the compressor. As a result of the suction action thus created, gas is pulled into the compressor. As the rotation progresses, the liquid is forced back into the chambers, compressing the gas. This gas is forced out of the discharge port and then leaves the compressor via the outlet flange. The compressor is fed continuously with liquid which serves to seal the clearances between inlet and discharge port and remove the heat of compression. This liquid leaves the compressor together with the gas to be compressed and is separated from the gas in a discharge separator.



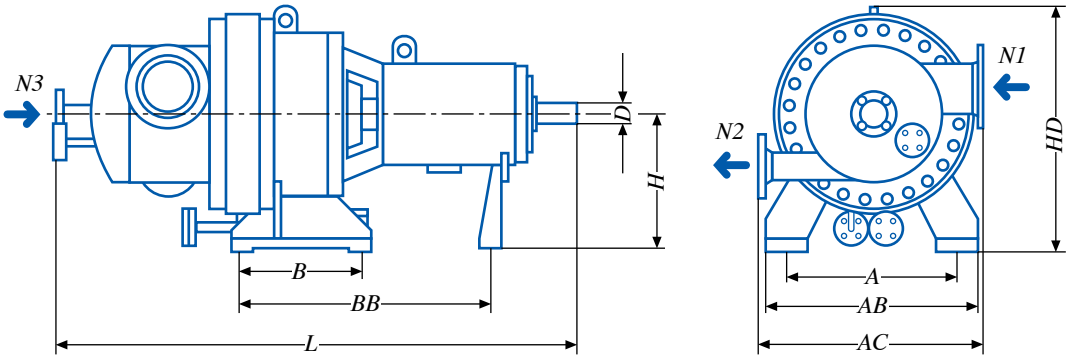
# WORKING RANGE OF
# NSB GAS PROCESSING LIQUID RING COMPRESSORS

*Liquid ring compressor range*




**MATERIALS.** Parts in contact with the process: Stainless Steel, Duplex Steel, C-Steel, Hastelloy, Titanium and others.

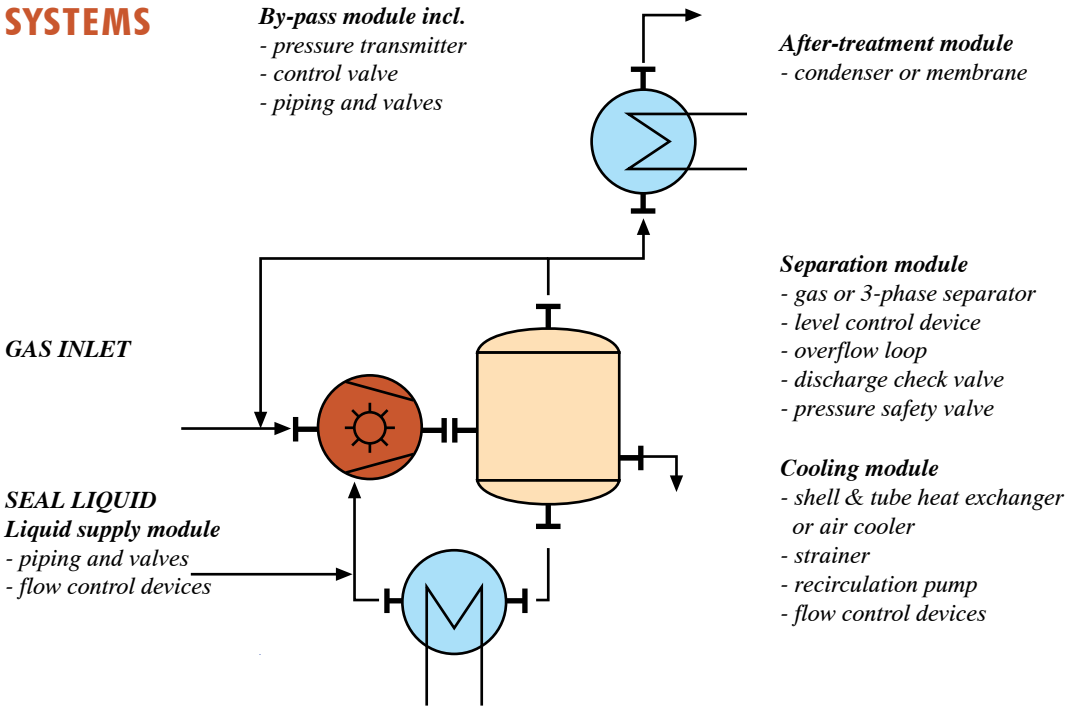
*Dimensions*




| Type | A | AB | AC | B | BB | H | HD | D | L | N1 | N2 | N3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB1/SB2.4-300 | 300 | 400 | 400 | 200 | 400 | 250 | 435 | 50 | 1150 | 100 | 50 | 25 |
| SB1/SB2.8-150 | 500 | 600 | 700 | 400 | 830 | 400 | 735 | 60 | 1575 | 150 | 80 | 40 |
| SB1/SB2.10-150 | 580 | 700 | 750 | 400 | 830 | 450 | 805 | 70 | 1730 | 150 | 80 | 40 |
| SB1/SB2.15-100 | 630 | 740 | 1000 | 450 | 930 | 500 | 1005 | 80 | 1785 | 200 | 100 | 50 |
| SB1/SB2.20-100 | 680 | 742 | 1000 | 450 | 930 | 560 | 1057 | 90 | 1895 | 200 | 100 | 80 |
| SB1/SB2.30-75 | 780 | 750 | 1200 | 550 | 1100 | 650 | 1315 | 100 | 2085 | 250 | 150 | 80 |
| TB1/TB2.40-100 | Dimensions upon request | | | | | | | | | | 300 | 200 |
| TB1/TB2.60-75 | Dimensions upon request | | | | | | | | | | 350 | 200 |

*Dimensions in mm (subject to change without notice)*

## SYSTEMS




## APPLICATIONS

- Refinery gas desulfurisation plants
- Off gas recovery plants
- Solvent recovery plants
- Monomer recovery systems
- Ozone and hydrogen peroxide compression

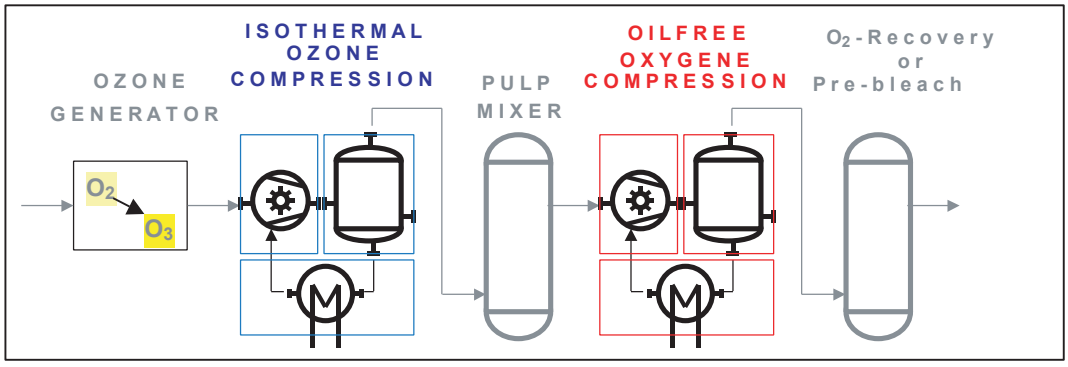
## OZONE COMPRESSION

The ability of liquid ring compressors to perform the compression nearly isothermally, i.e. keeping the gas cool, makes this type of machine ideally suited for all duties involving heat sensitive gases. nsb gas processing Liquid Ring Compressors are used efficiently to compress ozone to the required pressures of up to 14 bar keeping the degradation rates within acceptable levels.

## CUSTOMER'S BENEFITS

- Welded construction permitting proper material selection to minimise effect of catalytic degradation of ozone
- Safe and trouble free operation
- Low maintenance costs
- Easy operation
- Isothermal compression

## TYPICAL OZONE BLEACHING SYSTEM




## VINYL CHLORIDE MONOMER RECOVERY

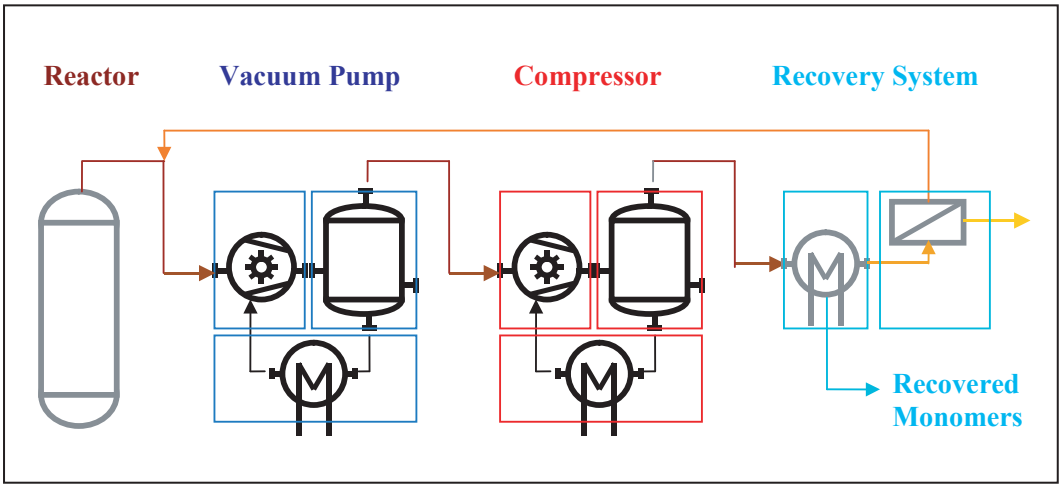
Unreacted vinyl chloride gas leaving the reactor directly or via a collector tank is recovered using nsb gas processing liquid ring compressors. The gas is compressed to its condensation pressure of approximately 7 bar and liquefied in a condenser. Non-condensable gases are separated in a subsequent multistage condenser operatingat temperatures down to -40° C or in a combination of a condenser and the more modern membrane technology recovering the cost intensive VC gas and minimising environmental problems.



## CUSTOMER'S BENEFITS

- Safe, easy and trouble free operation
- Low maitenance costs
- High recovery rate ad short pay-back time
- Isothermal compression, avoiding polymerisation of the gas
- No requirement of chilled water and no risk of freezing when using with a nsb membrane recovert technology

## TYPICAL VC-MONOMER RECOVERY SYSTEM




## CHLORINE COMPRESSION

Chlorine production plants use compressors to compress the gas to the required level and to liquify excess production quantities. Concentrated sulphuric acid is used as compressor sealing liquid.

## CUSTOMER'S BENEFITS

- Low investment costs
- Cool compression avoiding operational problems
- Safe, easy and trouble free operation
- Low maintenance costs

## FLARE GAS RECOVERY SYSTEMS

Flare gas recovery systems help oil refineries save energy costs and reduce air pollution. To take the gas pressure up to the required H2S absorption pressure of 5 to 6 bar nsb gas processing liquid ring compressors can be used to your advantage.

## CUSTOMER'S BENEFITS

- Safe and reliable operation
- Reduced maintenance costs
- Low investment costs
- Ease of operation
- Pay back frequently in less than 12 months

**SWISS QUALITY ASSURANCE.** Every compressor is tested after manufacture to measure suction capacity and power consumption in accordance with PNEUROP Standards 6612 / DIN 28431. Test records are made available. The manufacturing sources are qualified to ISO 9000.

**ENGINEERING SUPPORT AND SERVICE.** Experienced support is available for advice in planning new compressor systems. Qualified engineers can help optimise systems in respect to operating and installation costs or assist in starting up the systems supplied. This experience is at our customer's disposal.

**MILESTONES OF OUR COMPANY HISTORY** • 1834 Sulzer was founded • 1844 Burckhardt engineering works established in Basel • 1934 first liquid-ring vacuum pump • 1969 merge of Sulzer with Burckhardt to Sulzer Burckhardt • 1974 first APOVAC vacuum system • 1975 first COMBIVAC vacuum system • 1992 first PMZE and PMZA heavy duty compressors for low pressures delivered • 1999 first liquid-ring compressor for elevated discharge pressure • September 2000 nsb gas processing was founded to continue the liquid ring vacuum and compressor business of Sulzer Burckhardt.

nsb

Your Partner for Advanced Technology

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