





### Quality and Know How, A Pump's Most Efficient Combination

Klaus Union is one of the leading manufactures of pumps and valves specially designed for the chemical industrial market. The professional production capability acquired over more than 50 years, a sophisticated and state-of-the art fabrication process provide an excellent basis for finding optimum solutions to any special problems: versatile response to any specific requirement imposed by the user. Pump and valve units supplied by Klaus Union are of superior quality and come up to the highest standard. They contribute to appreciably enhance both performance and safety of your installation and, besides, they cut pollution to the benefit of environment and mankind. Klaus Union: We set the standard for pumps.

### **Quality Assurance**

It is the policy of Klaus Union to achieve adequate quality assurance for the manufacture of all products to ensure they comply with contractual requirements. All subsuppliers are totally committed to assure and achieve the contractual requirements through vigorous implementation of the quality assurance program. All purchased material is repeatedly inspected for conformity on receipt and after assembly. The quality assurance system established according to latest state-of-the art principles fully complies with the requirements specified in international codes

### The Safety System – Perfectly Seals Aggressive, Explosive and Toxic Fluids

and regulations.

High safety demands are put on pumps delivering highly dangerous fluids. In addition to their normal application, the pumps must prove their safe and reliable operation even under adverse and extreme conditions, all by maintaining the perfectly sealed condition for a very long period of time.

Is this a stringent requirement? Pumps and valves manufactured and supplied by Klaus Union under the tradename *sealex* incorporate this safety.



A quality assurance system that has been verified and certified warrants that the requirements imposed by you are fully complied



The pumps come without stuffing box, instead they are equipped with the permanent magnetic drive system thus ensuring leakage-free pumping of all fluids with their exceptional operational performance and reliability safely maintained.

The *sealex* system eliminates the need for shaft passages since the motor torque is transmitted to the perfectly sealed volutes in the absence of any mechanical contact. This advanced technology involves the central coupling where the permanent magnets with the same even number of poles are alternating thus ensuring a perfect rotational symmetry. Klaus Union is the holder of the following approval stamps:

- AD 2000 W0 / TRD 100
   AD 2000 HPO / DIN EN 729-2
- Inspection of a Production Facility for Pressure Vessels according to Directive 97/23 EC

The concentric design of the coupling safely prevents any undesired radial and axial forces from acting on the mechanical bearings.

Adaption of the torque to any required operational mode is made by varying the system diameter and its height.

Full rotation of the coupling will not affect the condition of the magnets. After de-energizing the drive, synchronization of both coupling halves is restored automatically.

















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### sealex Engineered by Klaus Union Advanced Concept Operating Successfully in Installations – World-wide

Research and development work continually made by Klaus Union focussing at an advanced technology of environmental compatibility has resulted in a product range that warrants safe and reliable operation in compliance with virtually all and any requirements.

In addition to the products listed in this leaflet, Klaus Union can assist you in resolving any of your special problems. Contact us for any further particulars you may require.

### **SLM NV**

Glandless centrifugal pump type SLM NV equipped with permanent magnet drive, DIN EN 22858 resp. special and complementary sizes included

The modular concept makes everything possible





### **Technical Data**

Q up to 2500 m<sup>3</sup>/h H up to 150 m.L.C. t from -120 °Cup to +300 °C p up to PN 16

Special constructions up to PN 400 and up to +450 °C higher capacities on demand

### Use

### Pumping

acids lyes hydrocarbon heat transfer liquids liquid gas aggressive, explosive and toxic liquids

### Domain

Chemical and Petrochemical Industries Refrigeration and Heat Engineering Liquid Gas Plants Galvanic Engineering Power Stations Tank Installations

### Construction

- horizontal centrifugal pump process type
   permanent magnet system
- permanent magnet system sealex, no shaft duct
   separation of liquid
- chamber / atmosphere by means of an isolation shell
  transmission of force slipless
- by inner and outer magnetsystem
- slide bearing made of silicon carbide, lubricated with liquid, for absorption of radial and axial forces
- bearing of outer magnet system (outer magnet carrier): deep groove ball bearings

### **Materials**

### Standard Type of

Construction	
spiral casing:	1.4408
impeller:	1.4408
isolation shell:	1.4571/2.4610
inner magnet car	rier:
	1.4571/2.4610
slide bearing:	silicon carbide
bearing bracket:	0.7043

### **Special Alloy**

1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4539 G-X2NiCrMoCuN2520 2.4685 GNiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further material on demand



### **SLM NV**

The modular concept makes everything possible The modular system allows each customer to "put together" the pump that meets his particular special requirements.

To meet this need a wide range of modules and safety components are available. All parts have been developed and designed to coordinate with each other to provide maximum flexibility and the perfect solution to your particular pumping application.

Grease or oil lubrication, close coupled, secondary sealing, thermal barrier, dry running capability, heating and cooling arrangements, centreline mounting and even pumps to ANSI and API standards.

### **Rub Ring Protection**

In the event of journal bearing or ball bearing failure, the rub rings prevent immediate damage to the isolation shell from either the inside or outside. For the rub rings to be effective they must be used in conjunction with an input power monitoring arrangement on the drive motor. (LC Controller)

### Replacement of Anti-friction Bearings and Secondary Sealing without Draining of Pump

By splitting the bearing bracket into bearing lantern and bearing support, wear parts (anti-friction bearings and radial lip seals) can be replaced without costly disassembly and drainage of the pump. The same applies to the replacement of the motor in case of a close coupled pump.

### **Temperature Sensor**

The internal recirculation can be monitored by measuring the temperature of the isolation shell.

### Load Detector (LC)

This monitors the shaft power and trips the pump if it detects underload caused by cavitation, flow interruption or desynchronisation of the magnetic drive or overload due to mechanical contact of the rub rings.



### SLM NV acc. to DIN EN 22858

In the following is a selection out of many variations:

### SLM NVO

Oil lubrication  $\cdot$  thermal barrier  $\cdot$ secondary sealing  $\cdot$  heated bearing lantern  $\cdot$  from - 120 °C up to +300 °C

### SLM NVS dry running capability · grease lubrication · thermal barrier · secondary sealing

**3 SLM NVB** Basic design · close coupled · from - 120 °C up to +160 °C

### SLM NVB

close coupled · heated bearing lantern · thermal barrier · secondary sealing · from - 120 °C up to +250 °C

### **6** SLM NVB

close coupled · fully heated · thermal barrier · secondary sealing

### SLM SVS

Side channel pump · process type · 1 - 8 stages · selfpriming · from - 120 °C up to +250 °C

### 🖉 SLM SVB

Side channel pump · close coupled · fully heated · thermal barrier · secondary sealing

### **③** SLM GVO

Multi-stage casing pump 1-6 stages · from - 120 °C up to +300 °C

### SLM NVN/OT

no partial flow - suited for dry run compatible with solid matters secondary sealing - 50 °C up to +200 °C

**SLM NVT** 

Glandless centrifugal pump type SLM NVT permanent magnet drive hydraulic acc. to DIN EN 22858 vertical construction





### **Technical Data**

Q up to 1000 m³/h H up to 150 m.L.C. t from -50 °C up to +150 °C p up to PN 16

Special constructions on demand

### Use

### Pumping

acids lyes hydrocarbon heat transfer liquids liquid gas aggressive, explosive and toxic liquids

### Domain

Chemical and Petrochemical Industries Refrigeration and Heat Engineering Galvanic Engineering Power Stations Tank Installations

### Construction

- vertical centrifugal pump dry supporting tube
   permanent magnet system
  - permanent magnet system
    sealex, no shaft duct
    separation of liquid
- chamber / atmosphere by means of an isolation shell
- transmission of force slipless by inner and outer magnet system
- slide bearing radial and axial made of silicon carbide
- bearing of outer magnet system (outer magnet carrier): deep groove ball bearings

### **Materials**

### Standard Type of

Construction	
spiral casing:	1.4408
impeller:	1.4408
isolation shell:	1.4571/2.4610
inner magnet carrier:	
	1.4571/2.4610
slide bearing:	silicon carbide

### **Special Alloy**

1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further material on demand

**SLM HV** 

**Glandless multi-stage** casing pump type SLM HV equipped with permanent magnet drive





### **Technical Data**

Q up to  $450 \text{ m}^3/\text{h}$ H up to 900 m.L.C.

t from -40 °C up to +180 °C p up to PN 100

special constructions on demand

### Use

### Pumping

acids lyes hydrocarbon hot water (boiler water) sea water fuels fatty acids

### Domain

Chemical and Petrochemical Industries Refineries Liquid Gas Plants Power Stations

### Construction

- horizontal multi-stage casing pump
- permanent magnet system sealex, no shaft duct • separation of liquid
- chamber / atmosphere by means of an isolation shell
- transmission of force slipless by inner and outer magnet system
- slide bearing made of silicon carbide, lubricated with liquid, for absorption of radial and axial forces
- bearing of outer magnet system (outer magnet carrier): deep groove ball bearings
- impellers in pairs, backto-back arrangement or in rows

### **Materials**

### Standard Type of Construction

suction casing:	1.4408
pressure casing:	1.4408
multi-stage casing	g: 1.4408
impellers:	1.4408
isolation shell:	1.4571/2.4610
inner magnet car	rier:
	1.4571/2.4610
slide bearing:	silicon carbide
bearing bracket:	0.7043

### **Special Alloy**

1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further materials on demand

### SLM LV

Glandless screw pump type SLM LV equipped with permanent magnet drive





### **Technical Data**

Q up to 4 m<sup>3</sup>/min H up to 160 m.L.C. t from - 10 °C up to +300 °C Δp up to 16 bar

special constructions on demand

### Use

Pumping isocyanate polycarbonate oils and fats manomere polyester resin viscous liquids

### Domain

Chemical and Petrochemical Industries Synthetic and Rubber Industries Mineral Oil Industry Colour and Lacquer Industries

### Construction

- positive-displacement pump
   permanent magnet system sealex, no shaft duct
- transmission of force slipless by inner and outer magnet system
- slide bearing radial and axial
  bearing of outer magnet carrier: deep groove ball
- bearings, grease-lubricatedtwo screw spindles, rotating
- towards each other
   spindles supported in exchangeable bearing bushes
- hydraulic compensation of axial force

### **Materials**

### Standard Type of Construction

casing: 0.7043 spindle: nitration hardened slide bearing: GG/GG, SiC/SiC isolation shell: 1.4571/2.4610 inner magnet carrier: 1.4571/2.4610 bearing bracket: 0.7043

further materials on demand

### SLM SV

Glandless side channel pump type SLM SV with magnetic coupling in process type design





### **Technical Data**

Q up to 35 m<sup>3</sup>/h H up to 310 m.L.C. t from -40 °C up to +250 °C p up to PN 40

special constructions up to PN 400 on demand

### Use

### Pumping

acids lyes hydrocarbon solvents liquid gas oxidate refrigerants

### Domain

Chemical and Petrochemical Industries Electrolysis Refrigeration Engineering Liquid Gas Plants Galvanic Engineering Tank Installations Vacuum Technology Extracting Plants

### Construction

- horizontal side channel pump, single or multi-stage, with NPSH pre-stage
- one pressure casing with a static sealing
  permanent magnet system
- permanent magnet system
   sealex no shaft duct
   separation of liquid
- chamber / atmosphere by means of an isolation shell • transmission of force slipless
- transmission of force slipless by means of magnetic coupling
- slide bearing made of silicon carbide, lubricated with liquid, for absorption of radial and axial forces
- bearing of outer magnet system (outer magnet carrier): deep groove ball bearings
- self-priming, pumping liquids containing gas

### **Materials**

### Standard Type of Construction

hydraulic casing	parts: 1.4408
pressure casing:	1.4571/1.4408
impellers:	1.4581
shaft:	1.4571
isolation shell:	1.4571/2.4610
inner magnet car	rier:
	1.4571/2.4610
bearing:	silicon carbide
bearing bracket:	0.7043

Special materials on demand

### SLM DV

Glandless centrifugal pump SLM DV with magnetic coupling (self-priming, pumping liquids containing gas)





### **Technical Data**

Q up to 450 m<sup>3</sup>/h H up to 60 m.L.C. t from -120 °C up to +300 °C p up to PN 8

### Use

### Pumping

acids lyes hydrocarbon liquid gas aggressive, explosive and toxic liquids

### Domain

Chemical and Petrochemical Industries

### Construction

- horizontal pump, selfpriming / pumping liquids containing gas
- permanent magnet system sealex, no shaft duct
- separation of liquid chamber / atmosphere by means of an isolation shell
- transmission of force slipless by inner and outer magnet system
- slide bearing made of silicon carbide as standard execution, lubricated with liquid, for absorption of radial and axial forces
- bearing of outer magnet system (outer magnet carrier): deep groove ball bearings

### **Materials**

### Standard Type of Construction

CONSTRUCTION	
spiral casing:	1.4408
impeller:	1.4408
isolation shell:	1.4571/2.4610
inner magnet car	rier:
	1.4571/2.4610
slide bearing:	silicon carbide
bearing bracket:	0.7043

# **Special Alloy** 0.7040

0./040 1.0416 1.4410 1.4538

further materials on demand

**SLM RA** 

Glandless agitator type SLM RA equipped with permanent magnet drive



### **Technical Data**

- Md up to 4500 Nm without gear reduction
- t from -120 °C up to +450 °C
- p up to PN 320

higher pressure rating on demand

### Use

### Mixing and

Homogenizing of acids

acias lyes hydrocarbon liquid gas suspensions aggressive, explosive and toxic liquids

### Domain

Chemical Industry Pharmaceutic Industry Grease and Soap Industries Research Textile Industry Paper Industry Process Manufacturing Galvanic Industry

### Construction

- permanent magnet system *sealex,* no shaft duct
- separation of liquid chamber / atmosphere by means of an isolation shell
- transmission of force slipless by inner and outer magnet system
- bearing of inner magnet system (inner magnet carrier): roller bearings made of Si<sub>3</sub>N<sub>4</sub> (silicon nitride) dry run up to 960 rpm
- alternative slide bearing made of silicon carbide or roller bearings in the liquid chamber
- bearing of outer magnet system (outer magnet carrier): deep groove ball bearings
- spezial constructions on demand

### **Materials**

### Standard Type of Construction

bearing lantern: 1.4571 inner magnet carrier shaft: 1.4571 isolation shell: 1.4571/2.4610 motor lantern: 1.0038 inner magnet carrier: 1.4571/2.4610

further materials on demand

Horizontal single-stage centrifugal pump **DIN EN 22858** 





### **Technical Data**

Q up to 2500  $m^3/h$ H up to 150 m.L.C. t from -40 °C up to +300 °C p up to PN 16

special constructions up to PN 400 higher capacities on demand

### Use

### Pumping

acids lyes hydrocarbon ammonium sulphate pulp sewage colouring matters salt solutions desalted water caprolactam

### Domain

Chemical and Petrochemical Industries Paper and Cellulose Plants Power Stations **Evaporation Plants** Ore Dressing Refineries Sugar Industry

### Construction

- horizontal centrifugal pump shaft supported in roller bearings, oil or grease lubricated
- shaft sealing: packing or mechanical seal
- mechanical seal single or double type, or tandem arrangement

### **Materials**

### Standard Type of

Construction	
spiral casing:	1.4408
impeller:	1.4408
casing cover:	1.4571
shaft:	1.1191
shaft sleeve:	1.4571
bearing bracket:	0.6025

Special Alloy 1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

rubber coated lining and further materials on demand

NO

Vertical centrifugal pump type TP, hydraulic acc. to DIN EN 22858 special and complementary sizes





### **Technical Data**

Q up to 1000 m<sup>3</sup>/h H up to 150 m.l.C. t from -100 °C up to +300 °C p up to PN 16

special constructions on demand

### Use

Pumping acids lyes sewage aggressive liquids

solid suspensions

# salt fuse **Domain**

cellulose

Chemical and Petrochemical Industries Paper and Cellulose Plants Power Stations Sewage Technics Irrigation Plants and Drainage Works Tank Installations

### Construction

- vertical, single-stage centrifugal pump
   impeller closed or open tyr
- impeller closed or open type with wear plate
  impeller hydraulically
- balanced
   shaft supported in radial SiC bearings
- grease-lubricated roller bearings in the lantern section
- separated pressure piping up to supporting flange
- shaft sealing by means of packing or mechanical seal

### **Materials**

### Standard Type of Construction

GOIISHOCHOH	
spiral casing:	1.4408
impeller:	1.4408
shaft:	1.4571
shaft sleeve:	1.4571
slide bearing:	silicon carbide
bearing lantern:	1.0038
shaft sealing:	depending on
	liquid

### **Special Alloy**

1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further materials on demand

TP

Propeller pump, vertical construction





### **Technical Data**

Q up to 18000 m³/h H up to 6 m.L.C. t from -50 °C up to +400 °C p up to PN 10

special constructions on demand

### Use

### Pumping

acids lyes paper and cellulose pulp brine heat transfer liquids

### Domain

Chemical and Petrochemical Industries Paper and Cellulose Industries Evaporation Plants Ore Dressing Synthetic Fertilizer Plants

### Construction

- vertical propeller pump for installation into tanks
- cast or welding construction
   adjustable propeller blades screwed with hub
- bearing bracket equipped with integrated tank flange
- shaft bearing: greaselubricated roller bearing
  shaft sealing: gland or
- mechanical seal
- pumping direction variable by adjusting propeller blades

### **Materials**

0.6025 GG-25 0.7043 GGG-40.03 1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNi5i1815 1.4408 G-X10CrNiMo1810 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further materials on demand

UP

Horizontal pipe bend propeller pump





### **Technical Data**

Q up to 12000 m<sup>3</sup>/h H up to 8 m.L.C. t from -100 °C up to +160 °C p up to PN 10

### **Special Constructions**

Q up to 20000 m<sup>3</sup>/h H up to 28 m.L.C. t up to 500 °C p up to PN 100 on demand

#### Use

### Pumping

acids lyes paper and cellulose mash brine (evaporation plants) synthetic fertilizer (liquid) sea water cooling water sewage colours

#### Domain

Chemical and Petrochemical Industries Paper and Cellulose Industries Evaporation Plants Ore Dressing Synthetic Fertilizer Industry Refineries Cooling Water Installations Installations for Sea Water Treatment

### Construction

- horizontal propeller pump
- casing in pipe bend, cast or welding construction
- adjustable propeller blades screwed with hub
   shaft begring: grease-
- shaft bearing: greaselubricated roller bearings
  shaft sealing: gland or
- mechanical seal
- change of pumping direction
   special type of construction:
- special type of construction:
   PV: propeller blades continuously adjustable during operation PK: propeller cap can completely be dismantled without disassembly of casing
   pumping direction variable
- pumping direction variable by adjusting propeller blades

### **Materials**

0.6025 GG-25 0.7043 GGG-40.03 1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further materials on demand





### **Technical Data**

Q up to  $450 \text{ m}^3/\text{h}$ H up to 900 m.L.C. t from -40 °C up to +180 °C p up to PN 100

special constructions on demand

### Use

### Pumping

acids lyes hydrocarbon liquid gas hot water (boiler water) sea water fuels

### Domain

Chemical and Petrochemical Industries Liquid Gas Plants Power Stations Refineries

### Construction

- horizontal multi-stage casing pump • impellers in pairs,
  - arrangement back-to-back or in rows
- shaft bearing: roller bearings outside the casing
- shaft sealing: packing or mechanical seal

### **Materials**

### **Standard Type of**

Construction 1.4408 suction casing: 1.4408 pressure casing: 1.4408 multi-stage casing: 1.4408 impeller: bearing bracket: 0.7043

**Special Alloy** 1.0619 GP240GH 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further materials on demand

### н

Horizontal multi-stage casing pump

Horizontal centrifugal pump double flux





### **Technical Data**

Q up to 4000 m<sup>3</sup>/h H up to 160 m.l.C. t from -20 °C up to + 300 °C p up to PN 25

special constructions on demand

### Use

### Pumping

acids lyes cooling water sea water

### sewage Domain

brine

Industrial Sections Cooling Water Pumps Drainage Pumps Sea Water Treatment Plants Circulating Plants

### Construction

- horizontal centrifugal pump casing separated in the centerline
- suction and discharge nozzle in bottom part
- shaft bearing: roller bearings outside the casing
- shaft sealing: mechanical seal or gland

### **Materials**

0.6025 GG-25 0.7043 GGG-40.3 1.4308 G-X6CrNi189 1.4361 G-X2CrNiSi1815 1.4408 G-X6CrNiMo1810 1.4539 G-X2NiCrMoCuN2520 2.4685 G-NiMo28 2.4686 G-NiMo17Cr 3.7025 G-Ti

further materials on demand

subject to alterations

### NZ

## Production Programme Pumps

SLM-Pumps with magnet drives

Chemical centrifugal pumps acc. to DIN EN 22858

Chemical centrifugal pumps in close coupled design

Multistage casing pumps

Side channel pumps

Vertical centrifugal pumps

Submerged pumps

Self-priming spiral casing pumps

Screw pumps

Special designs

SLM agitator drives



### Pumps

Chemical centrifugal pumps acc. DIN EN 22858

Multistage casing pumps

Horizontal and vertical propeller pumps

Bottom flange propeller pumps

Vertical centrifugal pumps (Nobox system)

Submerged pumps

Double-suction chemical pumps

Special designs

### Production Programme Valves

Globe valves with stuffing box

Globe valves bellow sealed Check valves Gate valves Swing check valves Strainers Sight glasses Bottom valves Relief valves Control valves High pressure valves Valves for cryogenics

Valves with electric or pneumatic drive

### Our Service: Very close to customers – all over the world

This most unique drive system, a wide range of products in best quality as well as many years of experience have made KLAUS UNION a worldwide leading supplier of pumps with magnet drives and valves. All over the world we are represented with our own companies, sales offices and agencies. All over the world we are offering complete services from perfect proposals and advice up to technical after-sales service.



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