DSP-4C





DOUBLE VOLUTE TWIN SCREW PUMP SERIES DSP-4C

WITH SHAFT SEALING ACC. TO API 676 3rd Edition



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TWIN SCREW PUMP SERIES DSP-4C ACC. API 676 3RD EDITION



Klaus Union Twin Screw Pump Series DSP-4C is a completely modular pump concept in accordance with the requirements of API 676 3^{rd} Edition.

It is a double volute, self-priming positive displacement pump for low, medium and high pressure applications suitable for transport of abrasive/non abrasive, corrosive/non corrosive, lubricating/non lubricating, high or low viscous fluids. The customer can choose between several pump casing pressure ratings, rotor designs and suction-/ discharge flange designs.

The pump is hydraulically balanced and the drive torque is transmitted from the drive screw to the idler screw via herringbone gears.

The heart of each pump is the pump's hydraulic. The screws rotate closely meshing but without contact to each other or the interchangeable liner.

As a result of the special profile geometry, sealed cavities are formed, which transport the pumped liquid continuously with lowshearandwithoutturbulencesfrombothsuction chambers axially to the discharge chamber.

For optimum strength and low shaft deflection both, drive screw and idler screw are manufactured from single piece bar stock.

Three standard rotor designs are available:

- ► HE High Efficiency
- MP Multi Purpose
- ► HF High Flow



The special shape of the Klaus Union screw & liner system has considerably less power consumption compared to standard geometries of comparable pump designs.

Pump screws, liner, bearings, mechanical seals, gears and casing covers are pre-assembled to a "Plug and Pump" cartridge unit as a standard. The cartridge design reduces the downtime of the pumps during overhauls significantly.

Experience Responsibility **Passion**

Twin Screw Pumps by Klaus Union are used in

- Oil & Gas Industry
- Tank Storage
- Chemical and Petrochemical Industry
- Power Generation and Fuel Oil Systems
- Shipbuilding

Twin Screw Pumps by Klaus Union are used for low and high viscous, clean or abrasive products as

- Crude Oil and Finished-Petroleum Products
- Neutral or Corrosive Chemicals
- Fuel Oil
- Lubricating Oil
- Tar
- Bitumen
- Asphalt
- ► Fats
- Resins
- Residues





Quality Assurance

A major component of the Klaus Union ethos is to ensure highest product quality. Existing quality assurance procedures with Klaus Union suppliers are constantly monitored from order placement to goods receipt and final assembly. This quality assurance system, developed on latest technologies, complies with the requirements of international regulations.

Klaus Union is a DIN EN ISO 9001 certified company



In accordance with TÜV NORD CERT procedures,

KLAUS UNION GmbH & Co. KG Blumenfeldstraße 18, 44795 Bochum

KLAUS UNION Service GmbH & Co. KG Blumenfeldstraße 18, 44795 Bochum

are certified according to DIN EN ISO 9001



Fig. No. 1: Twin Screw Pump On Site

DESIGN DETAILS SERIES DSP-4C



The description can be found on the following page \rightarrow

Design According to API 676 3rd Edition

01 > Casted Pump Casing

with Pressure Ratings of 16 / 25 / 50 or 100 bar (ASME 150 / 300 / 600 or 900 lbs). Higher Ratings available on Request.

- 02 Single or Double Acting Mechanical Seal Component or Cartridge Design.
- 03 > Timing Gears

Herringbone Type with Clamping Device.

04 Large Bearing and Gear Covers

with Well Dimensioned Cooling Fins with Reduced Requirements for External Lube Oil Systems.





05 Casted Casing Insert (Liner)

in Heavy Duty Design.

06 **Pump Screws**

from Single Piece Bar Stock, Low Pulsation Design with Optimized Screw Profile for minimized Power Consumption. Clearances designed to be contact free in Permissible Operating Range of the Pump.

07 > Casing Covers

with Connections for Seal Flushing, Quench and Instrumentation.



THE "PLUG & PUMP" **CARTRIDGE DESIGN**

Double volute twin screw pumps find applications in almost any type of industry. However, due to their special advantages in performance, a major no. of pumps operate on oilfields around the world.

More and more of those locations are in very remote areas, e.g. deserts, arctic environments, jungles or offshore platforms. With limited resources of near-by workshops, skilled labour and transport, overhauls and repairs are always a 🕨 Easy Exchange of the Pumping Elements even under special and time consuming challenge.

Klaus Union has successfully introduced a new and revolutionary "Plug & Pump" Design, built in accordance with the requirements of API 676, 3rd Edition.

The new "Plug & Pump" design (patent pending) offers a 🕨 Easy Retrofit of Existing Pumps in Conventional Design completely new approach to overhaul and maintenance of double volute twin screw pumps. Contrary to the conventional design, the hydraulic part of the pump consisting of the liner and the rotors comes ready assembled with the mechanical seals, the bearings, the casing covers and the timing gears as a ready to operate "Plug & Pump" cartridge unit.

Guide rails, supporting the installation of the cartridge, are available as an option.

User Advantages

- Major Reduction of the Downtime for Maintenance and Repair (Exchange of a 2 MW Cartridge within two hours)
- Faster Re-Start of Production
- Severe Field Conditions
- Easy Refurbishing of Cartridge Units at the User's Workshop or at the Factory with genuine KU spare parts
- Immediate Access to Replacement Parts by using Ready-To-Operate-Cartridge as Stock Item
- with Klaus Union "Plug & Pump" Cartridges



"Plug & Pump" - The Installation

Instead of time consuming disassemblies of the pumps during overhauls on jobsite, the fully assembled old cartridge can be easily pulled and replaced by a new one. The new cartridge can then be fitted in the following sequence:

Fig. No. 4:	Placement of the cartridge on the installation tool
Fig. No. 5:	The Cartridge Unit is Pushed into the Pump Casing
Fig. No. 6:	The Cartridge Unit is in Place and the Pump is Ready for Final Assembly with Covers

During overhaul, the pump casing, the drive motor and the suction and discharge pipework stay in place. Only the coupling must be re-installed and aligned after the change of a cartridge.

The optional installation tool is consisting of sliding rails running on antifriction bearings. It allows easy and precise alignment for sliding in the cartridge unit on site.

The removed cartridge can be refurbished with genuine spare parts at the operator's workshop or returned to the factory for inspection. The "Plug & Pump" cartridge design is available as a standard for all types and sizes of Klaus Union's Twin Screw Pumps Series DSP.



Fig. No. 2: Klaus Union Cartridge (Rotor Diameter 410 mm) on Installation Tool







Fig. No. 3: The Cartridge Unit is Placed on Guiderails



Fig. No. 4: Cartridge Half Way Installed



Fig. No. 5: Cartridge Completely Installed



TESTS AND INSPECTIONS SERIES DSP-4C

Tests and Inspections

All Klaus Union Double Volute Twin Screw Pumps are factory tested before their final despatch to the customer.

They are hydrostatic tested at 1,5 times the pump design pressure and performance

tested on the Klaus Union Test Bed with a test bed motor and tolerances in acc. with VDMA 24284, Class II, Group II. The test liquid is

water at ambient temperature.

Optionally, NPSH-Tests, Long Run Tests, Noise and Vibration Tests, String Tests and particular Non-Destructive Tests can be executed upon request.

All tests can be witnessed by the customer or his appointed representative.

Material certificates in acc. with EN 10204-3.1 are provided for all wetted and pressurized pump parts as a standard.



Fig. No. 6: DSP-M 440 on Test Field

Klaus Union **Quality is our** Success

DSP-4C High Flow Series Flow: above 8.000 m³/h [36,000 gpm] Diff. Pressure: above 25 bar [363 psi]

DSP-4C Multi Purpose Series Flow: above 7.000 m³/h [31,000 gpm] Diff. Pressure: above 50 bar [725 psi]

DSP-4C High Efficiency Sreis

Flow: above 5.000 m³/h [22,000 gpm]

Diff. Pressure: above 100 bar [1,450 psi]





B-ETRICE

Fig. No. 7: DSP-M 440 Pump Skids







PERFORMANCE, **TECHNOLOGY AND INNOVATION**

Performance Data	
Flow Rate	max. 5.000 m3/h (22,000 GPM)
Differential Pressure	max. 100 bar (1,450 psi)
Viscosity	max. 100.000 mm²/s (cSt)
Temperature	max. 350°C (662°F)

Higher flow rates upon request.

Construction Materials			
Pump Casing	Cast Carbon Steel 1.0619 (similar to A216WCB) Cast Stainless Steel 1.4408 (similar to A351 CF8M) Duplex Stainless Steel 1.4470 (A 890 4A / UNS J92205) Super Duplex Stainless Steel 1.4469 (A 890 / UNS J93372)		
Liner	Cast Carbon Steel 1.0619 (similar to A216WCB) Cast Stainless Steel 1.4408 (similar A351 CF8M) Duplex Stainless Steel 1.4470 (A 890 4A / UNS J92205) Super Duplex Stainless Steel 1.4469 (A 890 / UNS J93372) Wear Resistant Tungsten Carbide Coating		
Casing Cover	Carbon Steel or Stainless Steel 1.0425 (similar to A285C) Stainless Steel 1.4571 (similar to 316 Ti) Duplex Stainless Steel 1.4462 (A182-F51 / UNS S31603) Super Duplex Stainless Steel 1.4501 (A 276 / UNS S32760)		
Screws	Carbon Steel 1.7227 (similar to A506-4140), hardened Stainless Steel 1.4542 (similar to UNS S17400), hardened Duplex Stainless Steel 1.4462 (A182-F51 / UNS S31603) Super Duplex Stainless Steel 1.4501 (A276 / UNS S32760) Wear Resistant Tungsten Carbide Coating		
Shaft Seals	Depending on the actual operating conditions		

Upon request, Klaus Union Screw Pumps, Series DSP can be supplied also in Hastelloy, Inconel or Titanium.

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Sales Office



Product Range Pumps:

Pumps with Magnet Drive

- Centrifugal Pumps acc. to DIN EN ISO 2858 & DIN EN ISO 15783, SLM NV
- Centrifugal Pumps acc. to ASME B73.3M, SLM AV
- Centrifugal Pumps for Petrochemical Applications acc. to API 685, SLM APL / SLM APC
- Centrifugal Pumps for High Pressure Applications, SLM SV/SLM GV
- Centrifugal Pumps for High Temperature Applications, SLM NHO
- Self-Priming Centrifugal Pumps, SLM SV
- Multi-Stage Centrifugal Pumps, Tension-Rod or Barrel-Type Design, SLM GV
- Submerged Centrifugal Pumps, SLM NVT
- ► Twin Screw Pumps acc. API 676, SLM DSP-2C

Pumps with Shaft Sealing

- Centrifugal Pumps acc. to DIN EN ISO 2858 & DIN EN ISO 5199, NOV
- Multi-Stage Centrifugal Pumps, Tension-Rod or Barrel-Type Design, GOV/GOVT
- Horizontal and Vertical Propeller Pumps, P
- Bottom-Flange Propeller Pumps, UP
- Submerged Centrifugal Pumps, TP NO
- Submerged, Multi-Stage Centrifugal Pumps, TP GO
- Twin Screw Pumps acc. API 676, DSP-2C / DSP-4C

Product Range Valves:

- Globe Valves, T
- Globe Valves, Y
- Gate Valves, Isomorphous Construction Series
- Gate Valves, Wedge or Wedge Plates
- Relief Valves
- Check Valves
- Sight Glasses
- Strainers
- ► Filters
- Bottom Valves
- Safety Valves

Klaus Union Service Performance:

- ► Workshop / On-Site Repairs
- Genuine Spare Part Delivery Worldwide
- Spare Parts Storage
- Customized Spare Parts Management
- On-Site Maintenance
- Installation
- Retrofitting
- On-Site Testing / Monitoring
- Customer Advisory Service
- Start Up & Commissioning
- Individual 24 / 7-Service
- Trouble-Shooting
- ► In-House & On-Site Training
- On-Site Assembly and Disassembly
- Long-Term Maintenance Contracts
- Maintenance Planning and Consulting
- Diagnostics

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