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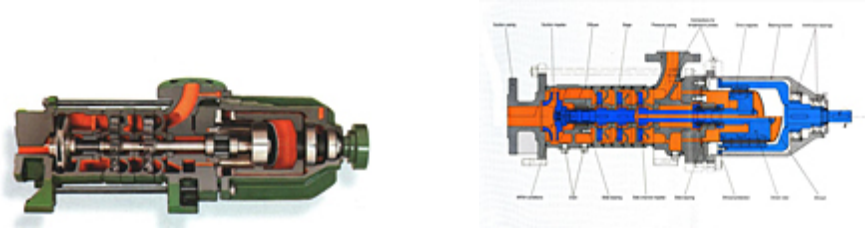
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ITEM # SCM, SIDE-CHANNEL PUMPS TYPE SCM

General

The DICKOW-pump, type SCM, is a one or multistage, self-priming horizontal side-channel pump with magnet coupling. The side-channel pump with its high differential head has the advantage of operating more economically than normal centrifugal pumps applied for low capacity and high heads. Due to these facts, the side-channel pumps are appropriate to solve many pumping problems in the chemical and petrochemical process. The SCM-pump is a heavy duty unit for handling clean pumpage without

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Specifications

Maximum Allowable Working Pressure	40 bar (580 psi)
Maximum Temperature	240°C
Maximum Transmissible Power	33 kW at 1450 rpm (53 HP at 1750 rpm)

Bearing Information

Outer ball bearings

The drive shaft is carried in generously dimensioned antifriction bearings, grease filled for life and protected against environment by radial seal ring. These bearings rarely need unscheduled replacement. L-10 rating of average life in excess of 3 years. Oil bath bearing housing on option for pumps with 50 and 65 mm (2" and 3") discharge flange.

Internal slide bearings

The internal bearings are of the sleeve type, positioned in the pumped liquid. Standard material for shaft sleeves and thrust bearings is pure Silicon Carbide, highly resistant against corrosion and wear. Standard material for the stationary bearings is carbon, but Silicon Carbide is also available on request.

Impeller Information

Side-channel impellers

The star-shaped side-channel impellers are rotating between suction and pressure disks in floating position on the pump shaft. No hydraulic thrust loads exist. Torque transmission between shaft and impeller by keys.

Suction impeller

To achieve low NPSH-conditions, a centrifugal impeller with enlarged eye area is located on suction side.

Protection Information

Shroud protection

The generous clearances between outer rotating magnets and stationary shroud prevents rubbing of the magnets on shroud surface in case of ball bearing failure. In such case, the cover will contact the bearing housing due to the tight clearance between these parts.

Dry running protection

Due to the tight clearance between the side-channel impellers and the stage disks, this type of pump will not tolerate dry running. For protection, a level control in the suction line is recommended. At self-priming conditions with a suction liquid level below pump centerline, an optoelectronic level detector can be fitted in the diffuser to control the required liquid level in the pump.

Additional Information

Construction

The SCM-pumps are single or multistage, horizontal side-channel pumps in heavy duty design with end suction and vertical discharge flange. The pump shaft is driven via a permanent magnetic coupling. The static containment shell forms a closed system with hermetically sealed liquid end.

Suction- and pressure disks

The suction and pressure disks are sealed to the atmosphere by confined O-rings, metal-to-metal fit, to prevent blowouts. In the shaft area, floating graphite impregnated PTFE-inserts are located for prevention of shaft deflection and seizing. The differential head is generated in the side-channel of the pressure disk.

Pump shaft

The large diameter shaft is carried in slide bearings and has no deflection and only minimum torsional load. Thus, wear-free running of the impellers is ensured.

Diffuser

Since these pumps can handle relatively large amounts of gas, they are inherently self-priming as long as sufficient liquid remains in the pump. Therefore, the diffuser is also designed as a retaining stage. That means that the pump will still be filled with liquid after switch off and can be restarted without problem also in self-priming service.

NPSH-conditions

The NPSH-conditions displayed on the next page are based on water at 20°C. When handling boiling liquids or hydrocarbons, the liquid level on suction side can be reduced to 50% of the published NPSH value.

Flameproof area features

Unlike "Canned motor" designs, the magnetic driven pump does not have electric windings adjacent to the fluid in the shroud and the magnet flux power transfer is non-sparking. Standard certified electric motors completely external from the pump housing are used, hence the possibility of flammable liquids contacting electrical windings is negligible.

Magnetic coupling

The single elements of the multipolar magnetic coupling are manufactured of "Cobalt-Samarium Rare Earth", a permanent magnet material with unlimited life. The internal magnets are completely encapsulated; no contact with the liquid. Energy is transmitted to the hermetically sealed liquid end by a bank of external magnets passing motive force through the containment shell to a bank of internal magnets. Inner and outer magnet rings are locked together by magnetic power and work as a synchronous coupling. The inner magnet ring transmits the required torque directly to the impeller. Overload of the magnetic coupling and slipping will not affect demagnetization. The magnetic drives are designed for electric motors, direct on line starting. Should a subsequent increase of motor power be required, the nominal power of the magnetic coupling can be increased accordingly by an additional series of magnets. The maximum transmissible power for SCM-couplings is 45 kW at 1450 rpm (60 HP at 1750 rpm).

Internal circulation

When pump is in operation it generates eddy currents which heat up the containment shell and the product in the magnet area. This heat is dissipated by internal circulation. The circulation flow is led from discharge through the magnet area and the pump shaft to the suction disk of the last stage. Pressurizing of the containment shell prevents flashing of the liquid in the magnet end.

Temperature control

The major heat source of magnetic driven pumps is in the containment shell area which is cooled at normal running by the handled liquid. Nearly all malfunctions can be detected by monitoring the liquid temperature in the containment shell area. Installation of a temperature sensor therefore provides an optimum inexpensive form of continuous process protection. All pumps are provided with the required connections for RTD-elements.

Materials

Materials

Depending on the requirements, the following materials are provided for SCM-pumps. Special designs on request.

Suction and pressure casing: Ductile iron GGG40.3, S.S. 1.4408 (G-X5CrNiMo 18.10)

Suction and pressure disk: Ductile iron GGG40.3, S.S. 1.4457 (G-X5CrNiMo 18.10)

Impeller: S.S. 1.4408 (G-X25 CrNiMo 25.9) Bronze G-SnBz

Pump shaft: Chromium steel 1.4021 (X20Cr13) S.S.1.4571 (X10CrNiMoTi 18.10)

Bearing bracket Containment Shell: Hastelloy C4