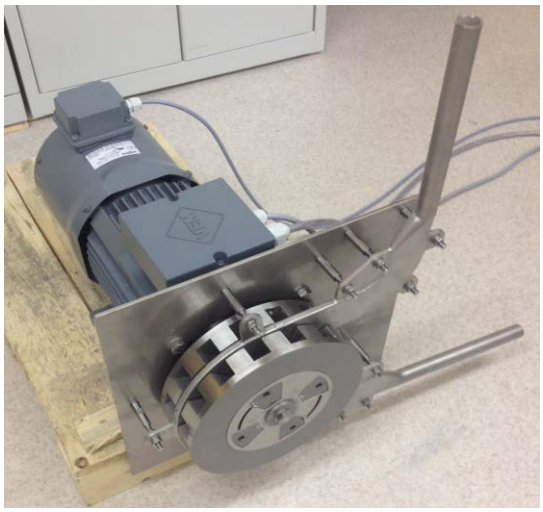
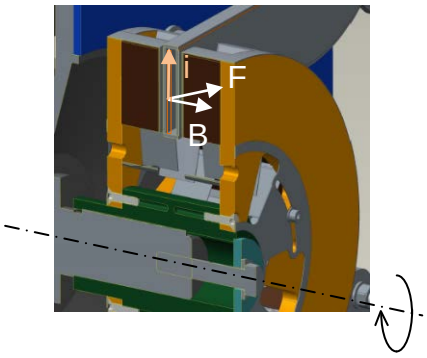
Systemanalyse & Automatisierungsservice GmbH

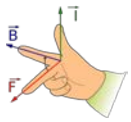
PMP

permanent magnetic pump
disc type or cylindrical type

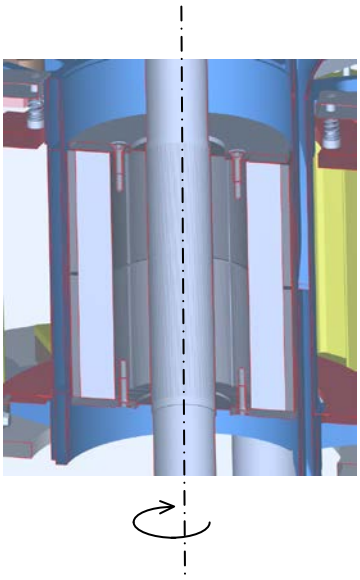
Contactless maintenance-free liquid metal pump







Function principle
disc type pump



Function principle
Cylindrical type pump

Working principle:

The operating principle of the permanent magnetic pumps bases itself on the Lorentz force on a moving live conductor in the magnetic field. In the case of the permanent magnetic pump the magnetic field moves due to the rotation of the rotor equipped with a magnet relating to the flow channel filled with liquid metal. The optimal drive of the pumps ranges is between 300-500 min^{-1} and can be increased to 1500 min^{-1}. Operating with higher drives strongly increases the heat losses.
The disc type pumps are available to accelerate the liquid metal flow in a circular arc of maximum 300°. The possibility for a pressure increase is therefore limited. Cylindrical type pumps are equipped with a channel of a circular arc of at least 360° to accelerate the fluid. The arrangement of several turns of the flow channel can increase the pressure drop by 14 bar.

Application area	***Your advantages***
The permanent magnetic pumps are suitable for the following application tasks: ✓ Liquid metal loops for research purposes ✓ Solar technology ✓ Casting industries ✓ Fluids: Pb, PbLi, PbBi, Al, Na, Li, InGaSn, Hg ✓ available for various pipe dimensions	• contact-free principle • choice of channel material in accordance with the application requirements • pressure head up to 14 bars with proper efficiency • scaled dimensions of pumps for a wide range of liquid metals • high temperature solutions are available • no additional heating inside the pump necessary (self-heating because of eddy currents)

Technical data:

Power supply:

supply voltage:	400 - 480 V AC
power input:	3 kW – 120 kW
rotation speed control:	Frequency converter

Dimensions / weight:

weight:	80 kg - 1600 kg
degree of protection (drive):	IP 54
Diameter of connecting pipes D_i:	16 mm - 120 mm
disc diameter (disc type pump):	250 mm - 500 mm
No. of channel turns (disk type pump):	0,5 (180 degrees) – 0,8 (300 degrees)
length of rotor (cylindrical type pump):	100 mm - 300 mm
diameter of rotor (cylindrical type pump):	250 - 400 mm
No. of channel turns (cylindrical type pump):	1 -4 (1x360 degrees – 4 x 360 degrees)

Previewed environmental conditions:

allowed ambient air temperature:	0°C to 30°C
allowed air humidity:	<85%
further installation conditions:	Dry interior room
operating temperature:	< 550°C fluid temperature (special design 750 degrees)
Fluid:	Liquid metal elect. conductivity >10^5 S/m and <= 10^7 S/m (Pb, PbLi, PbBi, Na, Li, InGaSn, Hg)

Operation:

rotation speed control:	Frequency converter 5 -1600 min^{-1}
Connection to automation:	Modbus-RTU, Modbus TCP, Profibus, Profinet, analog digital signal exchange
Additional measurements	channel wall temperature at 3 - 7 points

Imprint:

Representative:

SAAS Systemanalyse und Automatisierungsservice GmbH	D - 01728 Bannewitz / Germany Neues Leben 30 Tel.: +49 351 40468940 Fax: +49 351 40468941 E-mail: info@saas-online.de Web: http://www.saas-online.de/

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