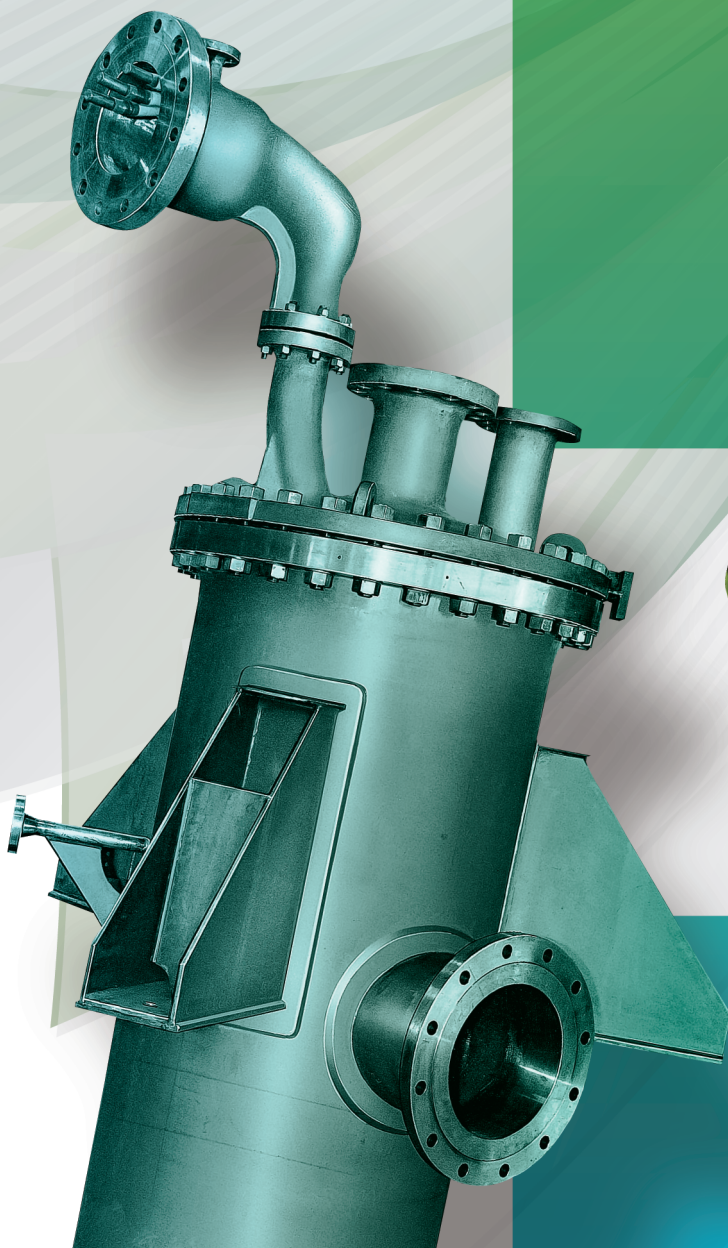


Submerged Motor Pumps





Shinko “SMB” barrel type pumps have been developed as send-out pumps in LNG/LPG/DME storage stations, or as pressurizing and circulating pumps in LNG cryogenic power generation plants.

The pump is submerged in cryogenic liquefied gas within the barrel installed outside of the storage tank. The pump can be taken out of the barrel easily by closing the valve located between the barrel and tank, when it is necessary to check the pump for maintenance or inspection.

The pump and motor are constructed as to form a single unit and be submerged in the pumping liquid. Thus, there is no fear of liquid and gas leakage because no sealing devices are required.

The motor is operated in liquid, and is completely isolated from the atmosphere. Hence, there is no fear of an explosion.

The pump has an even number of stage with the impellers divided into two groups of equal numbers, which are arranged back to back with each other. Therefore, the hydrodynamic thrust is so balanced that the ball bearings are free from handling undue loads.

The lower side of the first stage impeller is equipped with the inducer. The low NPSH feature of the inducer ensures safe operation even when the available NPSH is 0 meter.

Ball bearings are lubricated via the pumped liquid, which is also used for cooling the motor.

The stator coil is constructed with a form-wound type having a high insulation property and rigidity. Materials with a high insulation property, durability, and cryogenic resistance property are used for the motor insulation and varnish.

GENERAL CHARACTERISTICS

Item	Model	SMB 50	SMB 80	SMB 100	SMB 150	SMB 200	SMB 250
Pump	Type	Barrel type single / multi stage centrifugal pump					
	Capacity (m ³ /h)	20~700					
	Total head (m)	100~2500					
	Liquid temperature (°C)	40~ -196					
	Suction bore (mm)	100	150	200	300	350	450
	Discharge bore (mm)	50	80	100	150	200	250
	Place of installation	Outdoor					
Motor	Type	Submerged type 3-phase squirrel-cage induction motor					
	Synchronous speed (min ⁻¹)	3000 / 3600					
	Voltage (V)	400 / 440 , 300 / 3300 , 6000 / 6600					
	Frequency (Hz)	50 / 60					
	Coil	Form-wound type					
	Insulation	Class F					
	Rating	Continuous					
	Starting method	Full / reduced voltage start available					





Shinko “SMR” removable intank pumps are used as discharge or transfer pumps, and are installed at the bottom of LNG/LPG/DME storage stations such as underground receiving tanks, storage tanks, and PC tanks.

The pump and motor are constructed as to form a single unit and be submerged in the pumping liquid. Thus, there is no fear of liquid and gas leakage because no sealing devices are required.

The motor is operated in liquid, and is completely isolated from the atmosphere. Hence, there is no fear of an explosion.

Ball bearings are lubricated via the pumped liquid, which is also used for cooling the motor.

The hydrodynamic thrust of the impeller is well balanced. Furthermore, a balance sleeve is provided at the upper end of the shaft to alleviate the weight of the rotating element loaded onto the thrust ball bearings.

The inducer with high suction performance is equipped underneath the impeller. Hence, full capacity operation is possible while unloading, leaving as little residual liquid as possible.

The stator coil is constructed with a form-wound type having a high insulation property and rigidity. Materials with a high insulation property, durability and cryogenic resistance property are used for the motor insulation and varnish.

GENERAL CHARACTERISTICS

Item	Model	SMR 80	SMR 100	SMR 150	SMR 200	SMR 250	SMR 300
Pump	Type	Removable type single / multi stage centrifugal pump					
	Capacity (m ³ /h)	80~1500					
	Total head (m)	100~1000					
	Liquid temperature (°C)	40~ -196					
	Discharge bore (mm)	80	100	150	200	250	300
Motor	Type	Submerged type 3-phase squirrel-cage induction motor					
	Synchronous speed (min ⁻¹)	3000 / 3600					1500 / 1800
	Voltage (V)	400 / 440, 300 / 3300, 6000 / 6600					
	Frequency (Hz)	50 / 60					
	Coil	Form-wound type					
	Insulation	Class F					
	Rating	Continuous					
	Starting method	Full / reduced voltage start available					

GENERAL ARRANGEMENT

