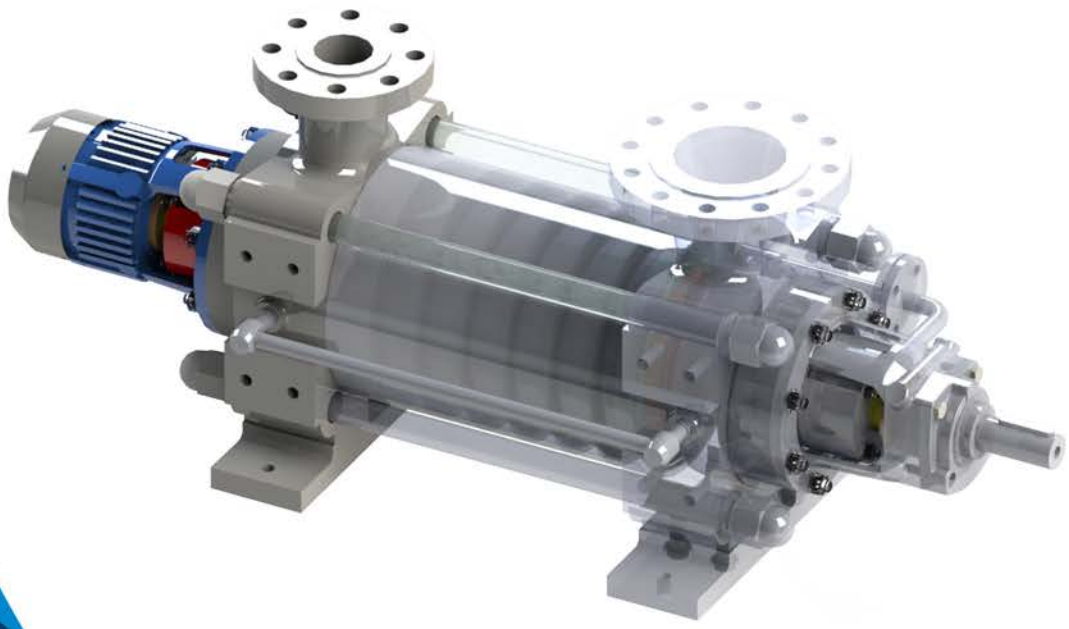
KEC

شرکت مهندسی ماشین های دوار خاور طوس

KHAVAR TOOS ENGINEERING CO.

KMSH-RO

High Pressure Multistsge Pumps for Reverse Osmosis Systems



Engineering and Manufacturing of Centrifugal Pumps

RICH HISTORY TO REACH BRILLIANT FUTURE

Description

KMSH-RO pumps are horizontal multistage pumps of radially split and between bearing design. These pumps could be categorized in ring section pumps or segmental-ring pumps which meet the technical requirements of ISO5199/ EN25199.

Main Application

To handle clean or slightly contaminated salty water
To use in desalination plants of seawater and brackish water via Reverse Osmosis (RO) process.

Construction

KMSH-RO covers 8 sizes, each having various hydraulic internals. In order to enable the pumps work in required duty points, standardized casings are developed to install different hydraulic impeller and diffuser sizes. Optimal selection of impeller diameter and diffuser size for each ensures that the pump closely matches the required duty conditions. Thanks to the advanced modular design of KMSH-RO pumps, there is a maximizing interchangeability besides reduction in the number of parts.

Technical Data

Capacity	up to 900 m^3/h
Head	up to 850 m
Discharge pressure	up to 100 bar
Speed (Max)	3600 rpm
Type of handled fluid	Seawater, Salty water, Brackish water, Chilled water
Mating dimensions for flanges	Suction casing: DIN 2501-PN16/25, DN 65 to 200 (**) Discharge casing: DIN 2501-PN100, DN 40 to 150 (**) ** ASME B 16.5 is available on request.

Designation

Example: **KMSH-RO 80-1000/7.DS.**

Designation guide	
Pump type	KMSH-RO
Discharge nominal diameter	80
Appropriate RO capacity (m^3/day)	1000
Number of stages	7
Material of construction	SD

KMSH-RO impellers are produced via precision investment casting, using also lost wax technology and then thoroughly cleaned and polished, in order to achieve high levels of efficiency and reach the nearest output to the theoretical design.

KMSH-RO

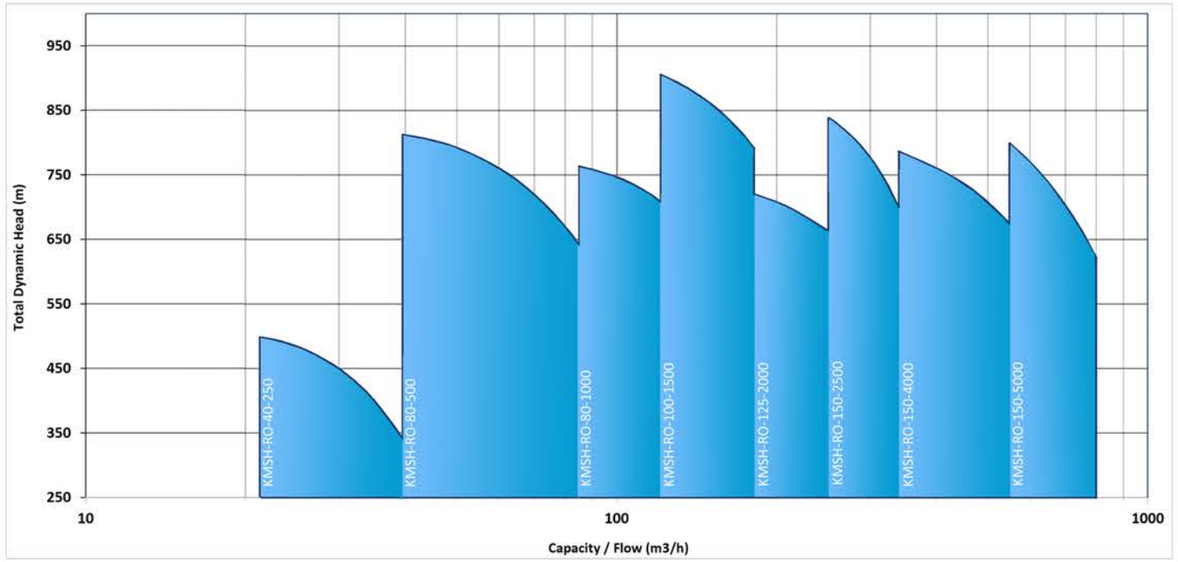
Pump Selection Guid

Item	Package Product Capacity m3/Day*	Recommended Pump Model
1	5000	KMSH-RO-150-5000
2	4000	KMSH-RO-150-4000
3	2500	KMSH-RO-150-2500
4	2000	KMSH-RO-125-2000
5	1500	KMSH-RO-125-1500
6	1000	KMSH-RO-80-1000
7	500	KMSH-RO-80-500
8	250	KMSH-RO-40-250

* More capacities are available on request.

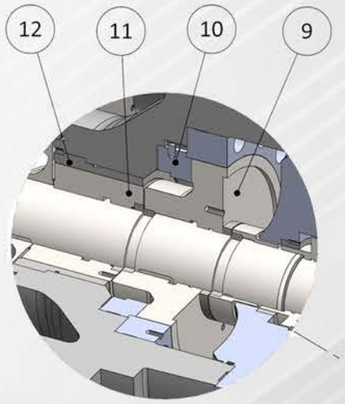
Thanks to KEC specialized experiences in the field of RO systems, KMSH-RO pumps has been developed to use in different ranges of RO product capacities from 250 m3/day to 5000 m3/day. It is a great chance for KEC that has the capability to match these pumps with customer requests. Our coverage ranges and performance curves are available to check with consumer needs. In addition, in order to prepare technical offers for wide variety of RO projects, KEC experts are ready to respond to the customer requests.

Coverage Curve



Material Table

Position	Part Name	Material of Construction (MOC)		
		Austenitic (A)	Duplex (D)	Super duplex (SD)
1	Suction casing	1.4408	1.4468	1.4469
2	Discharge casing	1.4408	1.4468	1.4469
3	Stage casing	1.4408	1.4468	1.4469
4	Intermediate impeller	1.4408	1.4468	1.4469
5	Suction impeller	1.4408	1.4468	1.4469
6	Diffuser	1.4408	1.4468	1.4469
7	Shaft	1.4462	1.4462	1.4462
8	Wear rings	SS / PEEK	SS / PEEK	SS / PEEK
9	Balance disc	1.4462	1.4462	1.441
10	Balance disc seat	1.4404	1.4462	1.441
11	Balance drum	1.4404	1.4462	1.441
12	Balance bush	1.4404	1.4462	1.441
13	Stuffing box housing	1.4408	1.4468	1.4469
14	Bearing housing	JL 1040	JL 1040	JL 1040
15	Shaft sleeve	1.4404	1.4462	1.441
16	Plain bearing (in Axial suction design)	SiC/SiC	SiC/SiC	SiC/SiC
17	Tie bolt	1.7225 (42CrMo4)	1.658	1.658

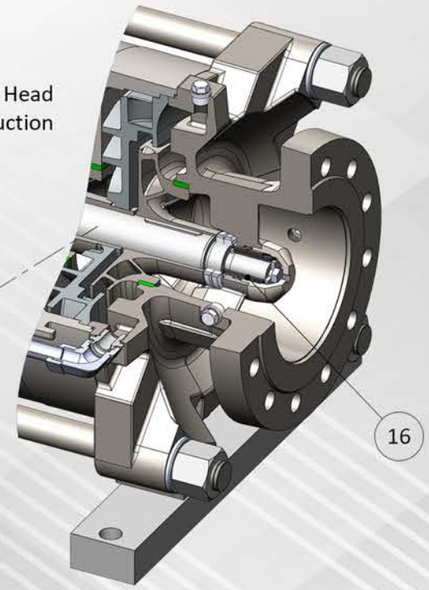


Axial Thrust Balancing System

Axial thrust balancing system has been designed based on hydraulic effects of balance disc, balance drum or a combination of them, which ensures the axial stability of rotor and minimizes the thrust loads transferred to the bearings. The balancing line is returned to the suction casing or in the upstream vessel.

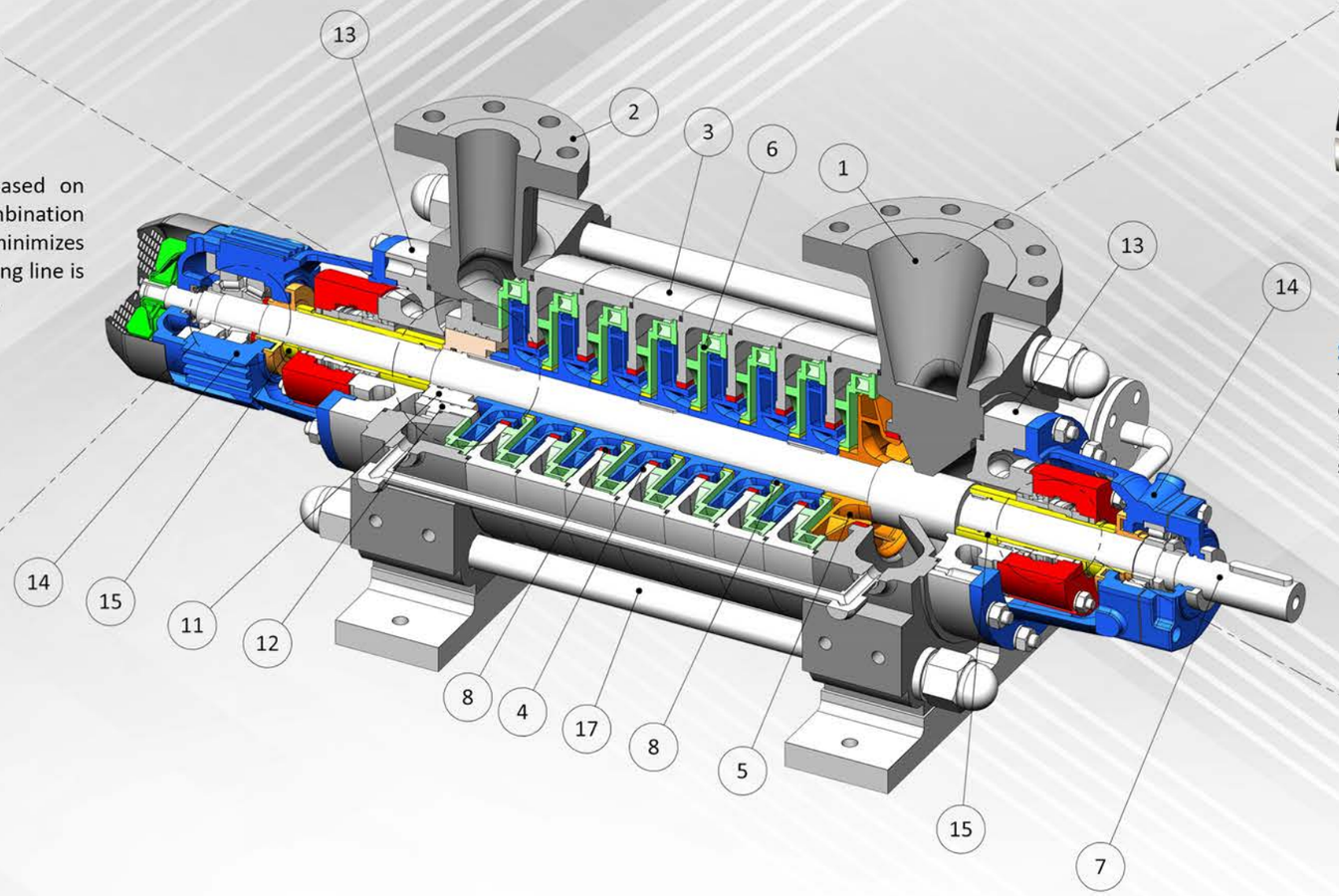
NPSHr Improvement

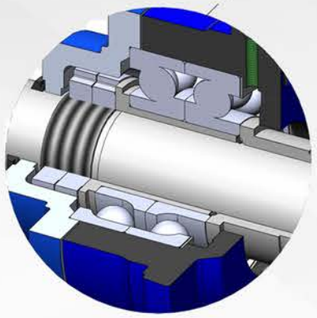
In order to decrease the Required Net Positive Suction Head (NPSHr), KEC has developed a different design for suction Impeller alongside axial suction consruction.



Suction Design

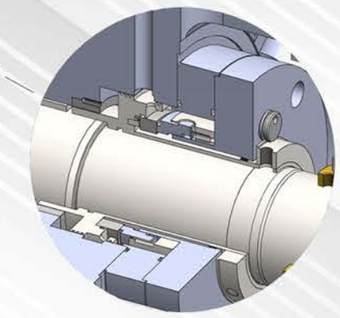
The Suction casing is available in standard axial flanges to cover the customer's requirements. A plain bearing is used in axial suction construction with SiC material for sliding parts.





Bearings

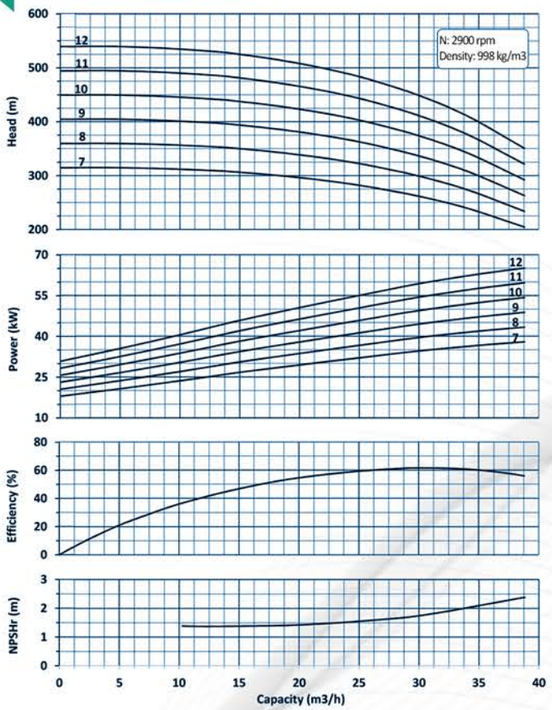
Based on the hydraulic design of pump and axial thrust system various types of the bearing are used to absorb radial loads and residual thrust. In balance disc design, roller bearings are used in bearing housings and for balance drum design, thrust bearings (taper roller or angular contact ball bearings) are used in discharge side bearing housing.



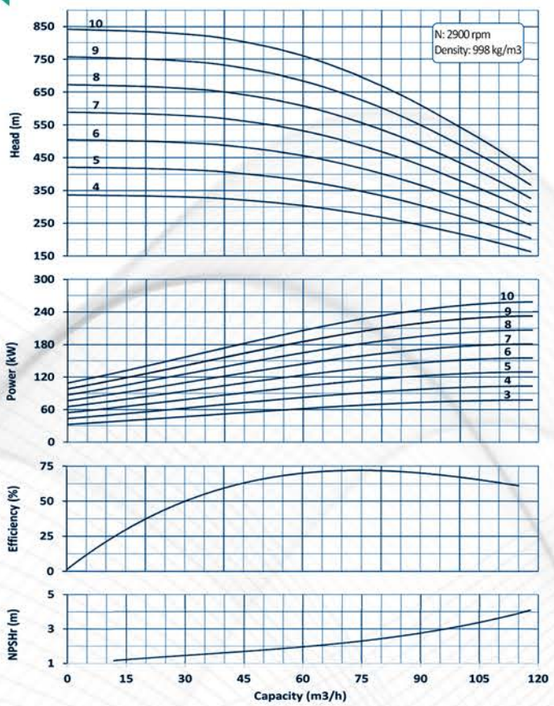
Sealing system

Different types of mechanical seals from major manufacturers can be installed according to the application and discharge pressure. Due to the separate bearing bracket and seal housing, it is easy to change the shaft seal without the need to dismantle hydraulic parts.

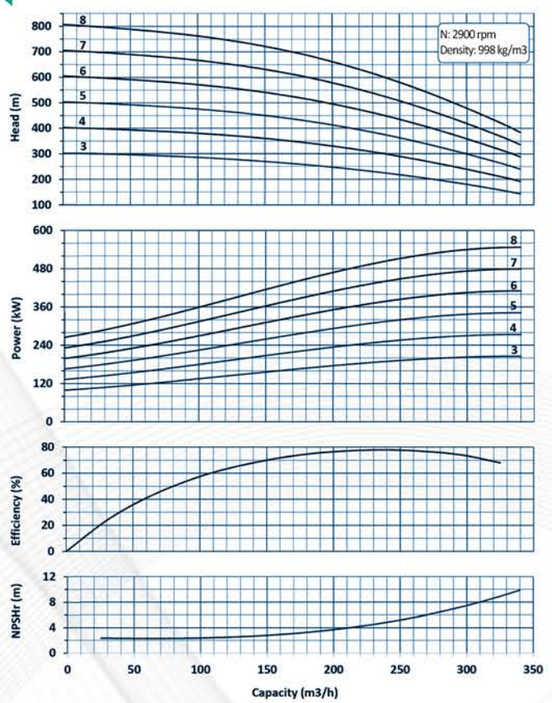
KMSH-RO-40-250



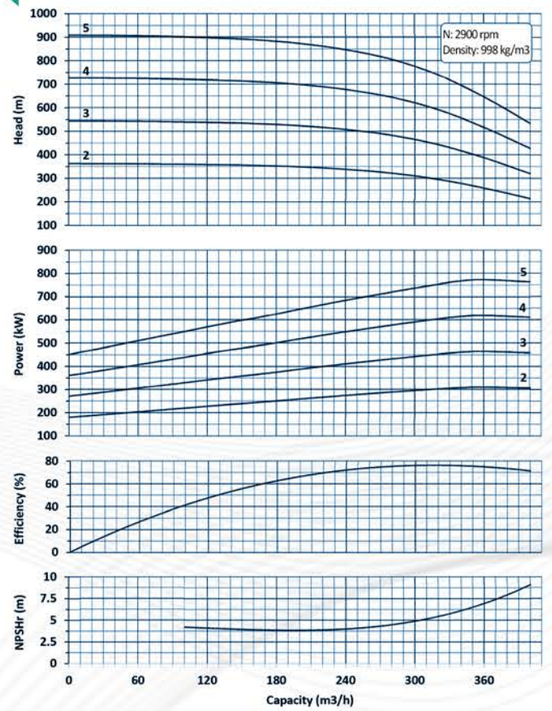
KMSH-RO-80-500



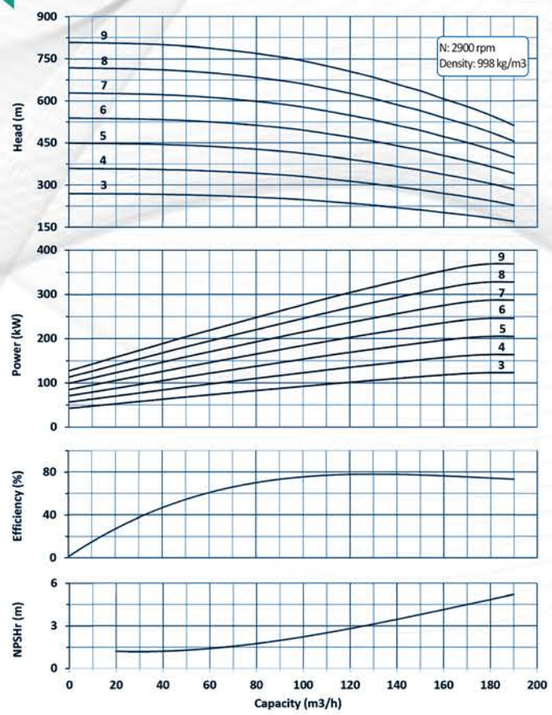
KMSH-RO-125-2000



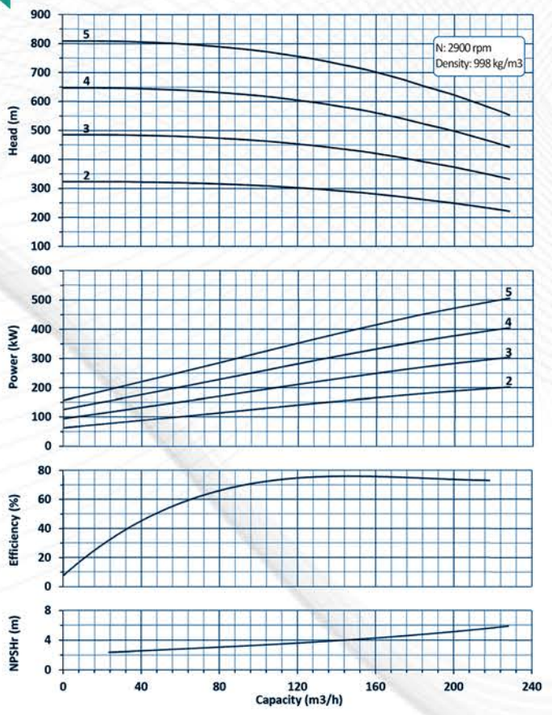
KMSH-RO-150-2500



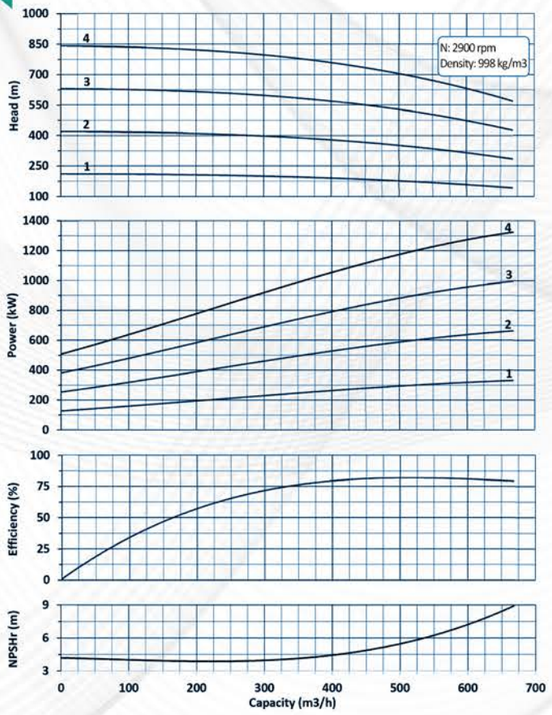
KMSH-RO-80-1000



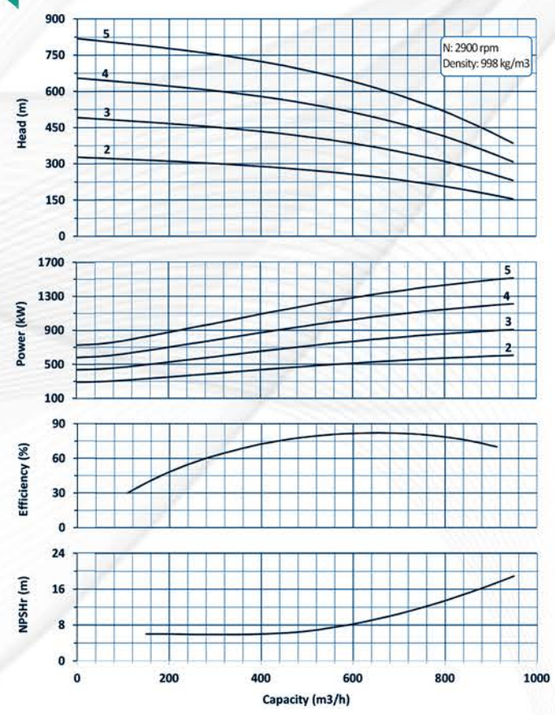
KMSH-RO-100-1500



KMSH-RO-150-4000



KMSH-RO-150-5000



About KEC

As one of the oldest Iranian activists in rotary machines industry with sixty years of experience, Khavar Toos rotary machines engineering company has managed to offer a proper platform for production and offering services related to rotary equipment at high levels of quality. Being a science-based collective, this company has successfully completed numerous projects in the area of technology development regarding various types of pumps and process centrifugal compressors based on its scientific infrastructure.

Given the deep understanding of the company's experts on rotary equipment including pumps and high-pressure centrifugal compressors as well as their performance basics, access to required equipment, and professional consultants generating useful ideas and key solutions, the company is capable of guaranteeing high-quality products and services.

It has been an honor for the company to have always offer invaluable cost-cutting opportunities and sustainable performance of its products to the customers, and appearing on the vendor list laid out by numerous significant Iranian organizations.

The main fields of the company's activities occur in major industries of the country such as water and wastewater, petroleum, gas and petrochemicals, power plant industries, steel and mines. The ultimate purpose of the company is to provide services to the country's industry, increasing the scientific level and quantitative and qualitative growth of rotary equipment with the approach of providing added value along with developing a suitable atmosphere for business in aforementioned areas.

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