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Our Company

MAS - DAF Makine Sanayi A.Ş has been a manufacturer of a full range of residential and commercial pumps since 1977. Since our founding we have dedicated our activities towards the manufacture of products that provide efficient utilizations of water and energy, as well as focusing our efforts on searching for ways to conserve the resources needed to sustain life.

Now exporting to more than 50 countries across the face of the globe, we of the MAS Group have continued to hold fast to our principle of continual self-development. Determined to increase our competitive strengths on domestic and foreign markets, in 2006 the company put its Düzce factory into full capacity service. The factory has been built on 40,000 m² of land with production facilities covering an area of 20,000 m². Through the years, our company has been propelled into a leadership position in the pump sector thanks to the production techniques the Group has developed, our machinery, R&D unit, professional staff, and our continual provision of top quality quality and modern services.

Our basic philosophy is to ensure that all of our actions are conducted in strict conformance with legal and business ethics, that our customers are informed and their rights always protected, that we provide the best possible quality of services and technology, and that we establish a system of human resources that meets the satisfaction of both our own personnel and our customers.

Backed by 33 years of developed technology and high quality of service, we stride forward into the future determined never to make any concessions in anything we do...

45,000 pumps/year MAS
28,000 pumps/year DAF
84,000 pressure tanks/year DAF
14,000 pressure tank/year DAF
R&D activities

Not only has the MAS Group achieved an important place on world markets, the MAS Group is also one of the few companies in the pump sector that is noted for the new models and designs it has developed. Our R&D department, which includes 16 technical personnel—all experts in their areas of specialty, three special CNC data processing centers assigned to these experts, as well as testing stations equipped with most modern technological devices and computers, continuously carries out comprehensive efforts that range from design to prototype production.

The MAS GROUP values the welfare of our staff and we try to create an environment where all our personnel are able to work efficiently with mutual respect and trust. We believe in team efforts and realize that the advancement of the MAS Group depends on the advancement of all the individual members of our team. We know that advancements in technology, research, and service provisions rely on the smooth collaboration of all members of our staff.

Never-ending search to enhance “economy and safety”

As the MAS GROUP we have been dedicated to offering our services to those industries that value and need high performance.

- Oil and fuel industry
- Chemical processing industry
- Water resources
- Power plants
- General industry

Devoted to perfection
Global competition has swept away any possible notions of complacency in traditional manufacture. With the appearance of more and more alternatives in the marketplace, the customer becomes increasingly demanding as it searches for the best possible quality levels in manufacture and service provisions.

We are well aware that to maintain and broaden our customer base we have to closely monitor and advance the quality of our products and our services. We have factored in systems to help us carry out our monitoring processes. Good products depend on high quality raw materials, so all materials used in production are evaluated as soon as they arrive at the factory. We also monitor the materials throughout the production processes. Any defects noted in materials during different stages of production arising from their individual properties, or from the production process itself, are closely monitored. Close and sustained monitoring of materials and production throughout all stages allow us to provide our customers with products that meet their demands.

The quality criteria that are required in production processes are continuously monitored by use of the Quality Control module, allowing us to trace conditions with the potential of giving rise to problems, which can then be resolved. In this way it is possible to minimize losses and process costs. Quality control procedures are also carried out following critical operations. By doing so, we ensure that our products meet the required quality standards.

“You may be sure that our products meet the required quality standards”
After sales services

“We offer high efficiency and technological superiority supported by excellent service…”

As the Mas Group Family we give great value to the special requests and needs of our esteemed customers. The satisfaction of our customers is just as important as the quality of service offered.

All of our products carry a full, 2-year company guarantee, while spare parts are guaranteed for 10 years from the date of manufacture. In this way we ensure the reliability of our products and the continuation of our quality provisions.

Extensive service network

Whenever and wherever you may be, the technical support service of the Mas Group is ready to help you with what you need. The fully trained and highly knowledgeable personnel of the technical service department are devoted to the provision of high quality service at all times and are always ready to offer creative solutions to any problem. The staff of our technical service are fully aware of problems that might arise and are ready as a group to provide all of the assistance required.

The highly qualified and authorized engineers and technical personnel of our extensive service network are always at the side of our customers to answer their questions, to evaluate the problems they have and to provide them with reliable solutions.

The maintenance programs aimed at increasing product performance and life are also part of the technical support services.
The sectors for which we provide products with our 33-year-long experience:

**Water Transfer**
We provide our customers with single and multistage pumps at water distribution centers, industrial and social installations and water pumping stations.

**Heating and Cooling Systems**
We provide circulation pumps used in central heating, hot and cold water and air conditioning systems. The circulation pumps are compatible with electronic control units, heating and air conditioning systems.

**Industrial Processes**
We provide single and multistage pumps to be used to transfer industrial fluids under pressure, to perform hot and cold water and thermal fluid transfers, to carry out chemical processes and in reverse osmosis systems.

**Residences and Offices**
The clean water supplies for residences and offices are provided by booster pumps and pressure tanks, by units with frequency converters and single and multistage pumps.

**Maritime Services**
For the marine sector we have such products as the norm centrifugal pumps made of stainless steel and bronze, in-line type pumps and horizontal and vertical multistage pumps to be utilized on marine vessels.

**Agriculture and Irrigation**
For garden and field irrigation and particularly for places where there is no electricity we provide diesel pumps for provision of water.

**Fire Fighting**
Our line of pumps used to fight fires includes in-line type, end suction and separable body double suction centrifugal pumps. The fire pumps are manufactured according to NFPA 20 and UL standards.

**Sewage Pumps**
We provide self priming and sump type pumps that can be used to transfer sewage, underground and septic water.

### Sectors that utilize our products

- **Water Transfer**
- **Heating, Cooling Systems**
- **Industrial Processes**
- **Residences and Offices**
- **Marine Utilizations**
- **Agriculture & Irrigation**
- **Fire Fighting**
- **Sewage Pumps**
- **Control Units**
- **Pumps with Frequency Converters**
- **Single and Multistage Pumps**
- **Booster Pumps**
- **Self Priming Centrifugal Pumps**
- **Vertical Sewage Sump Pumps**
- **Chemical vertical shaft submersible pump**
- **End Suction Centrifugal Fire Pumps**
- **In-line Type Centrifugal Fire Pumps**
- **Split Case Double Suction Centrifugal Fire Pumps**
- **Fi-Fi System Pumps**
- **Booster Pumps**
- **Single Pump Unit Boosters**
- **Multi Pump Unit Boosters**
- **Single Pump Unit Monophase Boosters**
- **Horizontal Tank Monophase Stainless Steel Boosters**
- **Two Pump Unit Monophase Stainless Steel Boosters**
- **Single Pump Unit Packaged Boosters**
- **Multi Pump Unit Vertical Shaft Stainless Steel Boosters**
- **Hydromatric Monophase Stainless Steel Boosters**
- **Interchangable Membrane Closed Pressure Tanks**
- **Wet rotor Circulation Pumps**
- **Frequency Control Panels**
End Suction Centrifugal Pumps

**General Specifications**
- **Flow Rate**: 5 ... 3500 m³/h
- **Head**: 4 ... 100 m
- **Operation Pressure**: 10 Bar
- **Operation Temperature**: -20 ... 110°C
- **Motor Speed Range**: 1000 ... 3600 d/d
- **Suction Flange**: DN 50 ... DN 400
- **Discharge Flange**: DN 32 ... DN 350

**Fields of Applications**
- Water supply and booster stations.
- Irrigation, sprinkling, drainage processes.
- Tank systems.
- Hot-cold water circulation in cooling systems.
- Pumping of condensed water.
- Circulating water in pools.
- Industrial and domestic fluid pumping processes.
- Marine applications.

**Design**
- Single stage, end suction, centrifugal volute pump.
- Main dimensions, compatible with EN 733 (DIN 24255) norm. A total of 3x6 designed pumps available in the series.
- Single suction with closed impeller, and thrust balanced by means of counter-balancing holes and back wear rings, thus acquiring a dynamic balance.
- The pump and the motor have a standard connection to the common base plate with a flexible coupling. Maintenance and repair procedures are easily carried out since the pump fixtures can be removed with the volute body remaining intact.
- Use of extended coupling also enables the removal of the pump fixtures without moving the motor or the volute body.
- The series has been designed so that parts are easily replaced and standardized. The entire series is made up of only 6 bearings and 10 shaft types, thus simplifying spare parts procurement.

Contact our company for customized options.

Mono-block Centrifugal Pumps

**General Specifications**
- **Flow Rate**: 5 ... 450 m³/h
- **Head**: 4 ... 100 m
- **Operation Pressure**: 10 Bar
- **Operation Temperature**: -10 ... 110°C
- **Motor Speed Range**: 1000 ... 3600 d/d
- **Suction Flange**: DN 50 ... DN 200 (PN 16) (DIN 2535)
- **Discharge Flange**: DN 32 ... DN 150 (PN 16) (DIN 2535)

**Fields of Applications**
- Water supply and pumping centers.
- Irrigation, sprinkling, drainage processes.
- Tank systems.
- Hot-cold water circulation in cooling systems.
- Pumping of condensed water.
- Swimming pool water circulation.
- Industrial and domestic fluid pumping processes.
- Marine applications.

**Design**
- NMM series pumps are single stage, end suction, mono-block type centrifugal volute pumps. They are of standard production with enclosed impeller and mechanical seal.
- Basic dimensions and flow rate EN 733 (DIN 24255) are compatible with proposed values.
- The thrust (axial force) acting on the motor is compensated by means of the abrasion gasket and balancing holes.
- Motor and pump are two separate components and there are two shafts. The motor shaft is joined to the pump shaft by a special clamp. In the case of motors with power over a certain value the pump and the motor shafts are joined by separate rigid coupling.
- Maintenance - repair processes are very easy due to the back pull-out design.
- Effective use of common parts in the design of the INM series facilitates spare parts acquisition and delivery times.
- Standard asynchronous motors are used for propulsion.
- In NMM pumps shaft sealing is prevented with a mechanical seal. All radial and axial thrust forces are supported by the motor bearing.

Contact our company for customized options.

In-Line Centrifugal Pumps

**General Specifications**
- **Flow Rate**: 2 ... 500 m³/h
- **Head**: 2 ... 100 m
- **Operation Pressure**: 10 Bar
- **Operation Temperature**: -20 ... 110°C
- **Motor Speed Range**: 900 ... 3600 d/d
- **Suction Flange**: DN 40 ... DN 200 (PN 16) (DIN 2535)
- **Discharge Flange**: DN 40 ... DN 150 (PN 16) (DIN 2535)

**Fields of Applications**
- Water supply and pumping stations.
- Irrigation, sprinkling, drainage processes.
- Tank systems.
- Hot-cold water circulation in cooling systems.
- Pumping of condensed water.
- Swimming pool water circulation.
- Industrial and social installations.
- Fresh water and sea water pumping in ships.

**Design**
- Single stage in-line type centrifugal pumps are produced with standard motors and mechanical seal.
- Pump flanges are designed in PN 16 pressure category compatible with DIN 2533. The suction and discharge flanges are identical and are on the same axis. Both flanges are equipped with pressure gage tapings.
- Single entry, closed impeller is equipped with rear rings to balance thrust and is dynamically balanced.
- Motor is connected to the pump by an adaptor and a flange.
- Motor shaft is joined to pump shaft by a special clamp. In the case of motors with power over a certain value the pump and the motor shafts are joined by separate rigid coupling.
- Pump shaft, motor and other parts can be removed without replacing the suction and discharge flanges and the pump volute. Thus, assembly and maintenance procedures are carried out very easily.
- Standard asynchronous motor is used to activate pump.
- In NMM pumps shaft leakage is prevented with a mechanical seal. All radial and thrust forces are supported by the motor bearing.

Contact our company for customized options.

Twin Head Mounted In-line Pumps

**General Specifications**
- **Flow Rate**: 2 ... 280 m³/h
- **Head**: 2 ... 16 m
- **Operation Pressure**: 10 Bar
- **Operation Temperature**: -20 ... 110°C
- **Motor Speed Range**: 900 ... 3600 d/d
- **Suction Flange**: DN 40 ... DN 150 (DIN 2535)
- **Discharge Flange**: DN 40 ... DN 150 (DIN 2535)

**Fields of Applications**
- HVAC systems
- Industrial plants
- Swimming pools
- Horizontal High Pressure Multistage Centrifugal Pumps
- Geothermal plants

**Design**
- INM - D series twin head mounted, in - line type centrifugal pumps.
- Formed by joining two standard INM series pumps with collector parts.
- Special design composed of a common collector and integrated check valves at each pump exit that provides for independent operation.
- In case of failure of the pump the second pump goes into operation, so the process does not come to a halt.
- Single suction, closed type impeller is equipped with rear rings to balance thrust and is dynamically balanced.
- Maintenance - repair processes are very easy due to the back pull-out design.
- Standard asynchronous motors are used to set pump in motion.
- The pump shaft is coupled with the motor shaft by means of a special clamp. This coupling makes it easy to dismantle the pump without removing the motor.

Contact our company for customized options.
SPLT ve SPLT.M series

Split Case Double Suction Centrifugal Pumps

General Specifications
Flow Rate: 30 - 4000 m³/h
Head: 10 - 140 m
Operation Pressure: 16 - 20 Bar
Operation Temperature: -10…110°C
Motor Speed Range: 960…3500 r/min
Suction Flange: DN 80…DN 500
Discharge Flange: DN 65…DN 500

Fields of Applications
- Water supply and booster stations.
- Water purification processes.
- Industrial washing.
- Fire fighting systems.
- Industrial and public applications.
- Marine and metallurgy sectors, power plants.
- Agricultural irrigation systems.
- General application in refineries.

Design
- Single stage, axially split casing, double-suction pumps.
- Double entry radial impeller has hydraulic thrust compensation.
- Suction and discharge flanges are along the same line.
- Upper casing is lighter than the lower body and joins it in such a way that it is easily assembled.
- Double suction pumps have the advantage of low NPSH (net positive suction head) features.
- The pump has two different types:
  - SPLT: Long type, heavy service type. Suitable for soft gasket application and the use of a mechanical seal is optional.
  - SPLT-M: Short type. Compact type pumps with short type shaft for only mechanical seal applications are also produced.
- The pump and the motor are connected by means of a flexible coupling on a common shaft. Diesel motor capable.

Contact our company for customized options.

SPLT-V series

Vertical Split Case Double Suction Centrifugal Pumps

General Specifications
Flow Rate: 30 - 3500 m³/h
Head: 10 - 180 m
Operation Pressure: 16 - 20 Bar
Operation Temperature: -10…110°C
Motor Speed Range: 960…3500 r/min
Suction Flange: DN 80…DN 500
Discharge Flange: DN 65…DN 500

Fields of Applications
- Maritime application.
- Water supply and booster stations.
- Industrial washing.
- Fire fighting systems.
- Industrial and public applications.
- General application in refineries.

Design
- Single stage, vertical split case, double-suction pumps.
- Vertical mounting arrangement allows drive motor to be mounted vertically, this is an advantage in installations where effective use of space is crucial.
- Double entry radial impeller has hydraulic thrust compensation.
- Lower casing is in-line design, suction and discharge flange are on the same line.
- The NPSH values are reduced and high suction lifts are possible thanks to double suction impeller.
- Mechanical seals are used to prevent leakage.

Contact our company for customized options.

KMU series

Horizontal High Pressure Multistage Centrifugal Pumps

General Specifications
Flow Rate: 1.16 m³/h
Head: 10…280 m
Operation Pressure: 25 Bar
Operation Temperature: -10…110°C
Stage Number: 3…18
Motor Speed Range: 1000…3600 d/min
Suction Flange: DN 25…DN 50 (PN 40)
Discharge Flange: DN 25…DN 50 (PN 40)

Fields of Applications
- In pumping of pure or relatively clean liquids in:
  - Boilers and condensation process.
  - Health and hygienic processes.
  - Industrial applications.
  - Shipyards, mines and power installations, filtration units.
  - Drinking water supply and distribution centers.
  - Water supply in high buildings.
  - Water treatment systems.
  - Industrial installations for provision of process water.

Design
- KMU series, multistage, horizontal centrifugal pumps.
- Single entry enclosed type impeller is dynamically balanced.
- The pump and the motor are connected by means of a flexible coupling on a common base plate. The flanges are compatible with DIN 2533.
- Pump shaft is designed for easy maintenance and repair with problem-free dismantling.
- When viewed from the motor end, the suction flange is opposite the motor and on the left, whereas the discharge flange is adjacent to and above the motor.
- The pump and discharge ports can be fitted in different directions and 90° apart.

Contact our company for customized options.

KMU - V series

Vertical High Pressure Multistage Centrifugal Pumps

General Specifications
Flow Rate: 1…16 m³/h
Head: 10…200 m
Operation Pressure: 25 Bar
Operation Temperature: -10…110°C
Stage Number: 3…14
Motor Speed Range: 1000…3600 d/min
Suction Flange: DN 25…DN 50 (PN 40)
Discharge Flange: DN 25…DN 50 (PN 40)

Fields of Applications
- Drinking water supply and distribution centers.
- Booster sets in high rise buildings.
- Water treatment systems.
- Industrial installations for provision of process water.
- Boilers and condensation process.
- Health and hygienic processes.
- Industrial installations.
- Shipyards, mineral mines, power installations, and filtration units.
- Irrigation.

Design
- KMU - V series pumps are vertical, multistage, centrifugal pumps.
- Impeller is single entry, enclosed and is dynamically balanced.
- KMU - V series pumps are available in 4 different sizes.
- Pump and motor shafts are connected with flexible coupling.
- In standard production the discharge flange is near the top and the suction flange near the bottom. When pump is viewed from the top motor area the pump rotation is in clockwise direction.
- Suction and discharge ports can be rotated by an angle of 90°.

Contact our company for customized options.
**KMB series**

**Fields of Applications**
- Drilling water sources.
- High buildings and industrial pressure systems.
- Water treatment systems.
- Fire fighting systems.
- Boilers and condensation processes.
- Health and hygienic processes.
- All kinds of industrial applications.
- Water pumping systems.
- Marine, metallurgy, energy sectors.
- Irrigation systems.

**General Specifications**
- **Flow Rate**: 5 ... 100 m³/h
- **Head**: 20 ... 300 m
- **Operation Pressure**: 40 Bar
- **Operation Temperature**: -10 ... 110°C
- **Stage Number**: 2 ... 14
- **Motor Speed Range**: 1450 ... 3500 d/d
- **Suction Flange**: DN 40 ... DN 80 (PN 40)
- **Discharge Flange**: DN 32 ... DN 65 (PN 40)

**KMB - V series**

**Fields of Applications**
- Drilling water sources.
- High buildings and industrial pressure systems.
- Water treatment systems.
- Fire fighting systems.
- Boilers and condensation processes.
- Health and hygienic processes.
- All kinds of industrial applications.
- Water pumping systems.
- Marine, metallurgy, energy sectors.
- Irrigation systems.

**General Specifications**
- **Flow Rate**: 5 ... 100 m³/h
- **Head**: 30 ... 220 m
- **Operation Pressure**: 40 Bar
- **Operation Temperature**: -10 ... 140°C
- **Stage Number**: 2 ... 14
- **Motor Speed Range**: 1450 ... 3500 d/d
- **Suction Flange**: DN 40 ... DN 80 (PN 40)
- **Discharge Flange**: DN 32 ... DN 65 (PN 40)

**OMK series**

**Fields of Applications**
- Drinking water sources.
- High buildings and industrial pressure systems.
- Water treatment systems.
- Fire fighting systems.
- Boilers and condensation processes.
- Health and hygienic processes.
- All kinds of industrial applications.
- Water distribution systems.
- Navigation, metallurgy, energy sectors.
- Irrigation systems.

**General Specifications**
- **Flow Rate**: 5 ... 220 m³/h
- **Head**: 30 ... 400 m
- **Operation Pressure**: 40 Bar
- **Operation Temperature**: -10 ... 140°C
- **Stage Number**: 2 ... 14
- **Motor Speed Range**: 1450 ... 3500 d/d
- **Suction Flange**: DN 50 ... DN 125 (PN 40)
- **Discharge Flange**: DN 32 ... DN 80 (PN 40)

**OMK - V series**

**Fields of Applications**
- Drinking water sources.
- High buildings and industrial pressure systems.
- Water treatment systems.
- Fire fighting systems.
- Boilers and condensation process.
- Health and hygienic processes.
- All kinds of industrial applications.
- Water distribution systems.
- Marine, metallurgy, energy sectors.
- Irrigation systems.

**General Specifications**
- **Flow Rate**: 5 ... 220 m³/h
- **Head**: 30 ... 400 m
- **Operation Pressure**: 40 Bar
- **Operation Temperature**: -10 ... 140°C
- **Stage Number**: 2 ... 14
- **Motor Speed Range**: 1450 ... 3500 d/d
- **Suction Flange**: DN 50 ... DN 125 (PN 40)
- **Discharge Flange**: DN 32 ... DN 80 (PN 40)

Contact our company for customized options.
KME series

**Centrifugal Pumps**

**Horizontal High Pressure Multistage**

**KME**

**Head:** 25 ... 500 m

**KME series includes 5 types depending on stage number, rotation**

**Impeller balance is achieved with back wear rings and balance**

**Boilers and condensation process.**

**Water supply in high buildings.**

**In pumping of pure or relatively clean liquids in:**

**Suction Flange:** DN 100 ... DN 250 (PN 16)

**Discharge Flange:** DN 80 ... DN 200 (PN 40)

**Fields of Applications**

- Pumping stations
- Water supply in high buildings.
- Water treatment systems.
- Fire fighting systems.
- Boilers and condensation process.
- Health and hygienic processes.
- Industrial and public applications.
- Water distribution systems.
- Marine, metallurgy, energy sectors.
- Irrigation systems.

**Design**

- KME series pumps have horizontal axis, radial separable body and are multistage centrifugal pumps that can be dismantled in stages.
- Closed type impellers are situated between bearings and are balanced dynamically.
- Impeller balance is achieved with back wear rings and balance holes. A balance disc or drum can be used for very high pressures.
- KME series includes 5 types depending on stage number, rotation speed, maximum flow rate attained and vary between 2-15 stages.
- In standard manufacture, the pump and the motor are connected by means of a flexible coupling on a single base plate. In standard assembly the discharge port is located at the motor end with the flange on top and the suction port is at the other side with flange oriented towards the left. Alternative Designs can be obtained upon request.
- Suction and discharge flanges can be situated on the left, right and on the top. On special order, the suction flange can be positioned at the motor end. In that case motor rotation would be in a counter-clockwise direction.

Contact our company for customized options.

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KME-V series

**Vertical High Pressure Multistage Centrifugal Pumps**

**KME-V**

**Head:** 30 - 500 m

**Stage Number:** 6 ... 18

**Operation Temperature:** -10 ... 110°C

**Operation Pressure:** 40 (64) Bar

**Flow Rate:** 20-300 m3/h

**Suction Flange:** DN 50 ... DN 400

**Discharge Flange:** DN 32 ... DN 150 (PN 16) (DIN 2535)

**Fields of Applications**

- Waterworks.
- High buildings for pumping water.
- Industrial installations for pumping water.
- Water treatment systems.
- Washing processes.
- Fire fighting systems.
- Boilers and condensation process.
- Health and hygienic processes.
- Industrial installations.
- Clean water pumping for ships.

**Design**

- The KME-V series consists of vertical shaft, vertically staged, closed radial impeller pumps.
- Suction and discharge flanges are compatible with DIN 2535. Suction and discharge mouths can be rotated to the right or left by 90°.
- Pump impellers are fully centrifugal, doubly inclined, winged (Francis) and closed type. Impellers have been dynamically balanced. Thrust is balanced to the rear by back wear rings up to certain stage numbers. A balance disc or drum is used for high pressures.
- KME-V pumps are made of stainless steel and have carefully ground base plates. The center of the pump shaft is thick and the diameters of the two ends are narrower, which ensures that the pump can easily be removed or placed from either end.
- The discharge end of the pump includes a double row of ball bearings (3300 C3 series) contacting angularly. Ball bearings are lubricated by grease. Deflectors in front of the bearings prevent any water leakage.

Contact our company for customized options.

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KMK series

**High Pressure Opposed Impeller Multistage Pumps**

**KMK**

**Head:** 4 ... 105 m

**Stage Number:** 2 - 15

**Operation Temperature:** -10 ... 110°C

**Operation Pressure:** 17 Bar

**Flow Rate:** 5 ... 3500 m3/h

**Suction Flange:** DN 25 - DN100 (PN 16) (DIN 2535)

**Discharge Flange:** DN 32 ... DN 350

**Fields of Applications**

- Marine applications.
- Hot-cold water circulation in cooling systems.
- Irrigation, sprinkling, drainage processes.
- Swimming pool water circulation.
- Tank systems.
- Industrial and domestic fluid pumping processes.
- Demineralized water systems

**Design**

- The KMK group pumps consists of horizontal axis, radially split, multi-staged centrifugal pumps with opposed (back to back) impellers.
- In standard manufacture, when viewed from the motor end, the suction port is at the dead end side of the pump on the left and the discharge flange is in the middle and above. By special request the discharge port can be situated in the place of the suction flange. In that case the direction of rotation should be specified (either to the right or left). Suction and discharge flanges are compatible with DIN 2546. Suction Flange can be turned to the right, left or up by 90°.
- Closed type and fully radial pump impellers are dynamically balanced. Thrust (axial force) is automatically balanced by converse impellers.
- KMK type pumps are made of AISI 420 quality stainless steel and finely ground shafts.

Contact our company for customized options.

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DSV series

**Vertical Stainless Steel Pumps**

**DSV**

**Head:** 0-110 m3/h

**Stage Number:** 2-15

**Operation Temperature:** -10 ... 110°C

**Operation Pressure:** 30 (50) Bar

**Flow Rate:** 5 ... 3500 m3/h

**Suction Flange:** DN 25 - DN100

**Discharge Flange:** DN 25 - DN100

**Fields of Applications**

- Boilers and condensation process.
- Water treatment systems.
- Industrial installations for provision of process water.
- Marine applications.
- Hot-cold water circulation in cooling systems.
- Irrigation, sprinkling, drainage processes.
- Swimming pool water circulation.
- Tank systems.
- Industrial and domestic fluid pumping processes.
- Demineralized water systems

**Design**

- DSV series consist of vertical, staged pumps.
- All parts which come into contact with water are made of stainless steel.
- Suction and discharge flanges are along the same axis.
- Simple body and perfect balance provides for low noise and vibration.
- Mechanical seal is completely leakage proof.
- Body, impeller and shaft are stainless steel.
- Energy savings with frequency control devices.
- High performance, safe operation, easy maintenance.

Contact our company for customized options.
**General Specifications**
- **Flow Rate**: 1 - 80 m³/h
- **Head**: 0 - 40 m
- **Operation Pressure**: 16 Bar
- **Motor Speed Range**: 1000 - 3600 d/d
- **Suction Flange**: DN 50 - DN 65
- **Discharge Flange**: DN 32 - DN 65

**Fields of Applications**
- Transfer of hazardous organic and inorganic liquids in chemical and petrochemical industries.
- Refineries.
- Paper industry.
- Food industry.
- Sugar industry.
- Sea water treatment systems.
- Power plants.

**Design**
- CPM type consists of horizontal suction, vertical discharge flange, single stage volute pumps. Open impellers compatible with DIN 24 256 and TS-EN 22 858 standards are used.
- Suction and discharge flanges are compatible with the DIN 2533 standards.
- Fully radial and open impellers are dynamically balanced. Thrust is balanced by back vanes.
- Because the shaft diameter is resistant to bending due to the short distance between the bed and the volute, the shaft has a compact and rigid structure. The rigid shaft enables operation under different loads.
- Roller bearings lubricated with oil or grease are used in centrifugal pumps.

**Uncooled thermal oil pumps**
- **Flow Rate**: 10 ... 400 m³/h
- **Head**: 5 - 100 m
- **Operation Pressure**: 100 ... 350°C
- **Motor Speed Range**: 15000 - 30000 d/d
- **Suction Flange**: DN 40 ... DN 125
- **Discharge Flange**: DN 32 ... DN 100

**Fields of Applications**
- Transfer of heat transfer fluid.
- Chemical installations and refineries.
- Paper and sugar industries.
- Chemical and plastic factories.
- Rubber industry.
- Vulcanizing and heating industries.
- Textile industry.

**Design**
- Single stage, end suction centrifugal pumps.
- Main pump dimensions are compatible with DIN 24256 (ISO 2858).
- Single entry, closed type impeller is used.
- Radial vanes are used behind the impellers to lower the pressure and to balance the thrust (axial force).
- The pump and the motor are connected by means of a flexible coupling or a common base plate.
- Maintenance of the pump is very easy. The shaft and other rotating parts can be removed without dismantling the suction and the discharge system.
- Since the pump uses many standard parts, spare parts are readily available.
- These pumps are designed so that there is no need for external cooling. Due to natural convection the pump temperature decreases towards the roller bearing.

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**General Specifications**
- **Flow Rate**: 0.5 ... 10 m³/h
- **Head**: 16 Bar
- **Operation Pressure**: -20 ... -140 °C
- **Motor Speed Range**: 1000 ... 1500 d/d
- **Suction Flange**: DN 50 ... DN 125
- **Discharge Flange**: DN 32 ... DN 100

**Fields of Applications**
- Pumping of pure liquids.
- Pumping of diesel oil and fuel installations.
- Transportation of viscous liquids.

**Design**
- The pump consists of two telescopic gears. The system is so simple that the probability of breakdown is very low.
- The gears ensure that all pressure remains below the limit of the system.
- Since the gears normally regulate themselves it is not necessary to regulate the pressure at the discharge port of the pump by means of a valve.
- The pump is made of leak-free with special seals.
- The pumps have high performance, safe operation and easy maintenance.

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**Self-Priming Centrifugal Pumps**
- **Capacity**: 10 - 800 m³/h
- **Total Head**: 4 - 40 m
- **Operation Pressure**: 6 Bar
- **Motor Speed Range**: 0 ... 60°C
- **Suction Flange**: DN 50 ... DN 250 (2”..10”)
- **Discharge Flange**: DN 50 ... DN 250 (2”..10”)

**Fields of Applications**
- Pumping of residential and industrial crude sewage liquids.
- Sewage treatment installations.
- Pumping of liquids containing sludge and solid particles.
- Pumping of waste water from factories.
- For use in all kinds of drainage and discharge systems.

**Design**
- **UKM - S series** pumps are self-priming centrifugal pumps with upper suction flap.
- Since they are self-priming pumps it is only necessary to place the end of the suction pipe into the liquid to be pumped.
- A flexible coupling or a V-belt pulley can be used to start up the pump directly in the case of a Diesel or an electric motor.
- **UKM - S series** consists of 6 different types: 2", 3", 4", 6", 8", 10".
- The impellers are two, open type and can pump up to 76 mm (3") solid particles depending on the size of the pump.
- The suction cover can be removed from the front, making it easy to reach the impeller. Any obstruction can be removed without touching the suction and discharge parts.
- The flap connected to the suction flange has been specially designed so that is possible to clean or to remove and install the flap without touching the suction system.
- The roller bearing (bearing bushing) is supported by the pump body. There can be no problem in speed up.
- UKM series pumps are very easy to use because they are of self-priming type. Once the suction pipe is placed into the liquid the pump starts to function in one minute maximum depending on the suction height.
**PS/PSH series**

**Chemical Vertical Shaft Submersible Pump**

**General Specifications**
- Flow Rate: 6 ... 26 m³/h
- Head: 4 ... 19 m
- Operation Pressure: 2.5 Bar
- Motor Speed: 1450 rpm
- Discharge Range: DN 50 (2”)

**Fields of Applications**
- Drainage of dirty water pits in furnace rooms.
- Pumping of residential and industrial raw sewage liquids.
- Drainage in sewage treatment plants.
- Pumping of liquids containing sludge and solid particles.
- Pumping of waste water from factories.
- Pumping of viscous liquids and suspensions.
- Pumping of liquid wastes of dye installations.
- In all kinds of drainage and discharge systems.
- Paper and cellulose industries.

**Design**
- PS/PSH series pumps are vertical shaft pumps that operate by means of a special bearing system.
- The suction flange and the impeller are within the outlet and are faced with a filter.
- The pump shaft is connected to the motor by means of flexible coupling.

**PSP series**

**Chemical Waste Sump Pumps**

**General Specifications**
- Flow Rate: 3 ... 70 m³/h
- Head: 15 ... 50 m
- Operation Pressure: 6 Bar
- Motor Speed Range: 1000 ... 3600 rpm
- Discharge Range: DN 32 - DN 80

**Fields of Applications**
- Fibrous sewage discharge.
- Industrial plants.
- Tank evacuation.
- Corrosive liquids.
- Evacuation of bilge water in ships.
- Chemical slurries.

**Design**
- Single stage, vertical shaft processing pumps with open or vortex type impellers.
- The open impellers are connected to the shaft by a wedge.
- The impellers are balanced according to ISO G 6.3. The back vanes of the impeller reduce the axial thrust and prevent the intake of solid particles.
- The cranks are designed so as to maximize hydraulic performance.

Contact our company for customized options.

**INM Self Priming**

**Pumps with Self-Priming Unit**

**General Specifications**
- Flow Rate: 2 ... 560 m³/h
- Head: 2 ... 100 m
- Operation Pressure: 6 Bar
- Motor Speed Range: 900 ... 3600 rpm
- Operation Pressure: 10 Bar
- Operation Temperature: -20 ... 110°C
- Operation Pressure: 2 ... 100 m
- Design
  - A vacuum pump connected to the suction end of the in-line pump carries out the suctioning.
  - When the device is activated, the vacuum pump goes into operation, dropping the pressure at the intake and allowing the pump to suction water. When the pump begins to suction water, the panel stops the vacuum pump.
  - This system is equipped with a 0.3-12 Bar pressure switch, 0 - 16 bar pressure gage and solenoid valve.

**Fields of Applications**
- Fresh water and sea water pumping in ships.
- Bilge water, fire, cooling water, sea water and fresh water in tanker.
- Industrial and social installations for self-priming.

Contact our company for customized options.
End Suction Centrifugal Fire Fighting Pumps

In-line Type Centrifugal Fire Pumps

General Specifications
- Flow Rate: 50 - 1250 gpm
- Head: 80 - 155 psi
- Operation Pressure: 0 - 60°C
- Motor Speed Range: 2950 rpm
- Suction Flange: DN 80 - DN 200
- Discharge Flange: DN 50 - DN 150

Fields of Applications
- Hospitals
- Offices
- Factories
- Power plants
- Schools
- Pharmacies
- Depositories

Utilizations
- Sprinkling systems
- Hydrant systems
- Flood systems
- Monitor systems
- Water screens

Design
- These are single stage, vertical shaft in-line type centrifugal pumps. These three pumps, YNM 525, YNM 825 and YNM 1531 are used for flow rates ranging between 50 and 1250 gpm.
- The main pump dimensions are compatible with DIN 24256. The pump flanges are designed according to UL standards ANSI/ASME B16 Class 250.
- The pump performances are compatible with UL standards.
- The single suction, closed type impeller is dynamically balanced against the thrust by use of back wear rings.
- Shaft leak prevention is provided by 5 unit soft packing gaskets and discharge systems.
- The rotating parts can easily be removed without touching the suction and discharge systems.
- Since there are very many common parts it is easy find and store spare parts.

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Horizontal Split Case Double Suction Centrifugal Fire Pumps

General Specifications
- Flow Rate: 50 - 2500 m³/h
- Head: 20 - 180 m
- Operation Pressure: 16 Bar
- Motor Speed Range: 1450 - 3600 rpm
- Suction Flange: DN 80 - DN 250
- Discharge Flange: DN 65 - DN 200

Fields of Applications
- Fire systems
- Hospitals
- Offices
- Airports
- Factories
- Power plants
- Schools
- Pharmacies
- Depositories
- Monitor systems
- Water screens

Design
- Single stage, horizontal, separable body, radial impeller, double suction pumps.
- The back-to-back design of the double entry radial impellers eliminates all thrust.
- The suction and discharge flanges are along the same axis.
- The pump and the motor are connected by flexible coupling onto a common base plate.
- Shaft leak prevention is provided by soft packing gaskets according to NFPA requirements.
- The maintenance of the pump is very easy. The shaft and the rotating parts can easily be removed without touching the suction and discharge systems.

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**ENM series**

**FIFI System Pumps**

**General Specifications**
- **Flow Rate**: 400 ... 4000 m³/h
- **Head**: 60 ... 150 m
- **Operation Pressure**: 16 Bar
- **Operation Temperature**: -20 ... 110°C

**Motor Speed Range**: 2900 ... 3600 d/d
**Discharge Flange**: DN 250 - DN 400

**Fields of Applications**
- Fireboats
- Tankers
- Marine application

**Design**
- Single stage, horizontal, separable body, radial impeller.
- The suction and discharge flanges are along the same axis.
- The pumps are equipped with a rigid shaft that can operate under different loads.
- In standard configurations, two roller bearings are used. A console bearing is optional.

**DF series**

**Booster Pumps**

**General Specifications**
- **Flow Rate**: 2 ... 60 m³/h
- **Head**: 20 ... 150 m
- **Operation Pressure**: 16 Bar
- **Operation Temperature**: 0 ... 60°C

**Motor Speed Range**: 2900 d/d

**Fields of Applications**
- Fire department and fireboat systems.
- Drinking water and tap water systems.
- Process and fire water provision.
- School, business and social installations.
- Hotels and holiday villages.
- Industrial installations, factories.

**Design**
- Multistage, vertical shaft pumps used in DS - DB - DM - DMA - DMB - DMB65 type boosters.
- **DS** - **DB** - **DM** - **DMA** - **DMB** - **DM65** type boosters can be produced with one, two, three or four pumps depending on the depth for which they will be used.
- Level floaters of the booster set prevent the pump from functioning without water.
- The shafts in booster pumps are hexagonal and are made of AISI 430F materials.
- In booster pumps, bearings are used to compensate for thrust.
- A mechanical seal prevents water leakage at the shaft.

**DS-DB-DM-DM65 series**

**Single Pump Unit Boosters**

**General Specifications**
- **Flow Rate**: 2 ... 60 m³/h
- **Head**: 20 ... 150 m
- **Operation Pressure**: 16 Bar (Max)

**Motor Speed Range**: 2900 - 3600 d/d
**Suction Flange**: DN 32 ... DN 350
**Discharge Flange**: 1”1/4 - 3”

**Fields of Applications**
- Fireboats
- Firefighting boats
- Firefighting ships
- Drinking water and tap water systems.
- Process and fire water provision.
- School, business and social facilities
- Hotels and holiday villages.
- Industrial plants, factories.

**Design**
- The DS - DB - DM - DMA - DMB - DM65 type multi-pump boosters consist of two to four multi-stage, vertical shaft centrifugal pumps.
- The boosters can be operated automatically or manually. The boosters should be operated automatically even in case of water stops.
- Level floaters of the booster set prevent the pump from functioning without water.
- The pumps and the motor are connected by means of a rigid coupling.
- The pumps are multiplied in such a way that the number of stops is reduced.
- The diameter of the suction port of the tank cannot be smaller than the diameter of the suction port of the pump.
- Pump rotation is clockwise when viewed from the motor end.

**DS-DB-DM-DM65 series**

**Multi Pump Unit Boosters**

**General Specifications**
- **Flow Rate**: 0 ... 240 m³/h
- **Head**: 20 ... 150 m
- **Operation Pressure**: 8 Bar

**Motor Speed Range**: 2900 - 3600 d/d
**Suction Flange**: DN 350 - DN 500
**Discharge Flange**: 1”1/2 - 2”

**Fields of Applications**
- Fire department and fireboat systems.
- Drinking water and tap water systems.
- Process and fire water provision.
- School, business and social facilities
- Hotels and holiday villages.
- Industrial plants, factories.

**Design**
- The DS - DB - DM - DMA - DMB - DM65 type multi-pump boosters consist of two to four multi-stage, vertical shaft centrifugal pumps.
- The boosters can be operated automatically or manually. The boosters should be operated automatically even in case of water stops.
- Level floaters of the booster set prevent the pump from functioning without water.
- The pumps and the motor are connected by means of a rigid coupling.
- The pumps are multiplied in such a way that the number of stops is reduced.
- The diameter of the suction port of the tank cannot be smaller than the diameter of the suction port of the pump.
- Pump rotation is clockwise when viewed from the motor end.
**DSP series**

Single Pump, Mono-Phase Boosters

**General Specifications**
- Flow Rate: 0 - 6 m³/h
- Head: 0 - 10 m
- Operation Pressure: 0 - 8 Bar
- Motor Speed Range: 1420 - 3600 d/d
- Discharge Flange: 1" 1/4
- Suction Flange: 1" 1/2
- Design: Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- Pump stage number varies between 4 and 10.
- There is the choice of completely stainless steel materials.
- Provides for extra comfort due to the low pressure between entry and discharge.
- Protection system against dry operation is available.

**Fields of Applications**
- Apartments and residences
- Schools, business centers and small industrial installations
- Hotels and social installations.

**Design**
- Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- Pump stage number varies between 4 and 10.
- There is the choice of completely stainless steel materials.
- Provides for extra comfort due to the low pressure between entry and discharge.
- Protection system against dry operation is available.

**Contact our company for customized options**

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**DSM series**

Single Pump, Mono-Phase Boosters

**General Specifications**
- Flow Rate: 0 - 6 m³/h
- Head: 0 - 10 m
- Operation Pressure: 0 - 8 Bar
- Motor Speed Range: 1420 - 3600 d/d
- Discharge Flange: 1" 1/4
- Suction Flange: 1" 1/2
- Design: Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- Pump stage number varies between 4 and 10.
- There is the choice of completely stainless steel materials.
- Provides for extra comfort due to the low pressure between entry and discharge.
- Protection system against dry operation is available.

**Fields of Applications**
- Apartments and residences
- Schools, business centers and small industrial installations
- Hotels and social installations.

**Design**
- Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- Pump stage number varies between 4 and 10.
- There is the choice of completely stainless steel materials.
- Provides for extra comfort due to the low pressure between entry and discharge.
- Protection system against dry operation is available.

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**HDSH series**

Horizontal Tank Monophase Stainless Steel Boosters

**General Specifications**
- Flow Rate: 1 ... 8 m³/h
- Head: 12 - 60 m
- Operation Pressure: 8 Bar
- Motor Speed Range: 2900 - 3600 d/d
- Discharge Flange: 1" - 1 1/4
- Suction Flange: 1" - 1 1/2
- Design: Silent, comfortable and reliable, multi-stage pump package booster pumps.
- Operating switch included in the package provides for safe and smooth functioning of the booster. It does not require an electric panel.
- Included in the package are a level floaters that prevents dry operation, silent check valve, chassis and the rubber feet prevent vibrations.
- The number of stages of the pump varies ranges between 4 and 10.
- Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- All materials can be made of stainless steel upon special request.

**Fields of Applications**
- Apartments and residences
- Schools, business centers and small industrial installations
- Hotels and social installations.

**Design**
- Silent, comfortble and reliable, multi-stage pump package booster pumps.
- Operating switch included in the package provides for safe and smooth functioning of the booster. It does not require an electric panel.
- Included in the package are a level floaters that prevents dry operation, silent check valve, chassis and the rubber feet prevent vibrations.
- The number of stages of the pump varies ranges between 4 and 10.
- Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- All materials can be made of stainless steel upon special request.

**Contact our company for customized options**

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**HDSH.2 series**

Two Pump Unit, Mono-phase Stainless Steel Boosters

**General Specifications**
- Flow Rate: 1 ... 16 m³/h
- Head: 12 - 60 m
- Operation Pressure: 8 Bar
- Motor Speed Range: 2900 - 3600 d/d
- Discharge Flange: 1" 1/2
- Suction Flange: 1" 1/2
- Design: Silent, fully automatic, low electric consumption, economical and comfortable.
- Stainless steel shaft and horizontal pumps, body and impeller.
- Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- The tank use is compatible with European safety standards (CE).
- The membrane inside the tank is compatible with German standards of health, gives no odor to water and prevents bacterial growth.
- Level floaters prevent the pump from functioning without water.
- It is a booster set composed of 2 pumps that are horizontal type, multistage centrifugal pumps.

**Fields of Applications**
- Apartments and residences
- Schools, business centers and small industrial installations
- Hotels and social installations.

**Design**
- Silent, fully automatic, low electric consumption, economical and comfortable.
- Stainless steel shaft and horizontal pumps, body and impeller.
- Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- The tank use is compatible with European safety standards (CE).
- The membrane inside the tank is compatible with German standards of health, gives no odor to water and prevents bacterial growth.
- Level floaters prevent the pump from functioning without water.
- It is a booster set composed of 2 pumps that are horizontal type, multistage centrifugal pumps.
- Mechanical seal completely prevents leakage.
- Assembly is easy and economical.
- The tank use is compatible with European safety standards (CE).
- The membrane inside the tank is compatible with German standards of health, gives no odor to water and prevents bacterial growth.
- Level floaters prevent the pump from functioning without water.
- It is a booster set composed of 2 pumps that are horizontal type, multistage centrifugal pumps.

**Contact our company for customized options**
**SUPERDAF series**

**Single Pump Package Booster Pumps**

**General Specifications**
- Flow Rate: 0 - 4 m³/h
- Head: 78 m
- Operation Temperature: -10…110°C
- Operation Pressure: 8 Bar
- Motor Speed Range: 2900 - 3600 d/d

**Fields of Applications**
- Apartments and residences
- Schools, business centers and small industrial installations
- Marine applications

**Design**
- Booster pump set that has a single pump, multi-stage centrifugal pump with the motor block mounted on the pump.
- Number of pump stages range between 4 and 10
- Quiet, comfortable and reliable, multi-stage pump package booster pumps
- Mechanical seal completely prevents leakage.
- All materials are ready for use.
- Assembly is easy and economical.
- Available in all stainless steel parts.
- Triphase/Monophase available.

**HDSV series**

**Multi-Pump, Vertical Shaft Non-corrosion Booster Pumps**

**General Specifications**
- Flow Rate: 0 - 110 m³/h
- Head: 26 - 200 m
- Operation Pressure: 17 Bar
- Motor Speed Range: 2900 - 3600 d/d
- Suction Flange: 1”
- Discharge Flange: 1”

**Fields of Applications**
- Apartments and residences
- Schools, business centers and small industrial installations
- Hotels and social installations

**Design**
- Single and multi-pump boosters with vertical, multi-stage pumps
- The pumps have stainless steel body, shaft and impeller.
- All elements that come into contact with water are made of non-corrosion materials.
- Simple body and perfect balance provide for low noise and vibration.
- Mechanical seal completely prevents leakage.
- Frequency control devices enable energy consumption.
- High performance, safe operation and easy maintenance.

**FDH series**

**Hydromatic Monophasic Stainless Steel Steel Boosters**

**General Specifications**
- Flow Rate: 1 - 8 m³/h
- Head: 12 - 40 m
- Operation Pressure (Max): 8 Bar
- Motor Speed Range: 2900 - 3600 d/d
- Suction Flange: 1”
- Discharge Flange: 1”

**Fields of Applications**
- Apartments and residences
- Schools, business centers and small industrial installations
- Heating and cooling systems

**Design**
- Monophasic booster pumps composed of horizontal shaft and a multi-stage pump with a flow control device (hydromatic) mounted on top.
- Hydromatic boosters do not have maintenance requiring parts such as pressure switch and membrane tank. The pump continues to operate for a while after pumping the water so the system does not need the use of a tank.
- FDSH boosters operate automatically.
- The initial and final pressure difference is low providing for extra comfort.
- Mechanical seal completely prevents leakage.
- Shaft, body and impellers are made of stainless steel.
- Assemblage is easy and free of charge.
- Protection system against dry operation is available.

**Pressure Tanks**

**Interchangeable Membrane Closed Pressure Tanks**

**General Specifications**
- Flow Rate: 5 ... 3500 m³/h
- Head: 4 ... 105 m
- Operation Pressure: 10 Bar
- Motor Speed Range: 1000 ... 3600 d/d
- Operation Temperature: -10…110°C
- Discharge Flange: DN 32 ... DN 150 (PN 16) (DIN 2535)

**Fields of Applications**
- Heating, air condition systems and industrial installations as single or double pipe systems
- Floor heating, primary loading stages
- Used in boiler or tank filling stages

**Design**
- Inside the vessels used in sanitary applications is a totally hygiene butyl membrane that will not taint the water with odor. The membrane used in heating and cooling systems is made of EPDM that is surrounded with nitrogen gas under pressure.
- To protect against corrosion, the outer surfaces of the vessels are painted with electrostatic baked powder paint. The inner surface of the condensation tanks with changeable membrane is corrosion resistant as long as there is no damage to the membrane and the surface does not come into direct contact with water.
- Under normal conditions (no foreign particles being present in water and switch number being properly selected), the closed pressure tanks have a very long lifetime.
Frequency Controlled Panels

**TYPE A**

**Design**
In standard manufacture, the pilot pump has an inverter and the other pumps have direct or star-delta starting with... The pressure is measured by the pressure transmitter located on the discharge collector which gives an analog signal. Soft starter is optional in the standard system.

**General Specifications**
- Made of 1.5 mm DKP metal sheet up to 50x75x22 mm and of 2 mm sheet for larger dimensions. Electrostatic powder paint is used.
- Automatic stop provided by the alarm pressure which is set in accordance with German standards.
- Protection against dry operation by use of a float (liquid level relay is optional).
- Excess flow and short circuit protection.
- Pilot pump has inverter; the other pumps have standard on-off start.
- All operation modes observed on panel by means of leads.
- The pressure is measured by the pressure transmitter located on the press collector which gives analog signal.

**TYPE B**

**Design**
The pilot pump has an inverter and the other pumps start up with standard delta connection (pilot pump is flexible). The pressure is measured by the pressure transmitter located on the press collector which gives analog signal. The standard soft starter is optional.

**General Specifications**
- Made of 1.5 mm DKP metal sheet up to 50x75x22 mm and of 2 mm DKP sheet for larger dimensions. Electrostatic powder paint is used. Entrance and exit are below with panel connected to fireproof connector.
- Touch button and screen for simulating operation and breakdown conditions.
- Observation of the set pressure, tolerance and pressure transmitter value on the screen.
- Observation of past breakdown conditions by actual date and time.
- Observation of all breakdown conditions (operation in the absence of water, motor thermal breakdown, transmitter failure).
- Observation of operation on the main screen.
- Observation of pump frequency, voltage and current value.

**TYPE C**

**Frequency Controlled Panels**

**Design**
Pumps are controlled and monitored by PLC. One of the pumps is operated with frequency control in order to keep the pressure of the system constant. PLC is used to keep the pressure of the system constant with a tolerance of ±0.2 bar depending on the amount of water desired. Pressure is measured by means of the pressure transmitter on the press collector which sends analog signals. The youngest pump in the system is operated by the frequency converter by means of the pressure transmitter on the press collector which sends analog signal. Soft starter is optional in the standard system.

**General Specifications**
- Made of 1.5 mm DKP metal sheet up to 50x75x22 mm and of 2 mm sheet for larger dimensions. Electrostatic powder paint is used. Entrance and exit are below with panel connected to fireproof connector.
- Touch button and screen (LCD) for simulating operation and breakdown conditions.
- Observation of the set pressure, tolerance and pressure transmitter value on the screen.
- Observation of past breakdown conditions by actual date and time.
- Observation of all breakdown conditions (operation in the absence of water, motor thermal breakdown, transmitter failure).
- Observation of operation on the main screen.
- Observation of pump frequency, voltage and current value.