

OEM Pumps

▶ **Diaphragm Pumps** for Liquids and Gases



▶ **Swing Piston Pumps** for Air



▶ **Accessories**



INNOVATIVE
TECHNOLOGY
WORLDWIDE



NEUBERGER

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For detailed product information, use our Info-Fax (see form at end) or contact one of our KNF subsidiaries (see back side for addresses).

We offer even more!

- ▶ **ATEX-rated diaphragm pumps**
- ▶ **Comprehensive line of laboratory pumps and systems (reference number 16)**
- ▶ **Custom product modifications not available from our standard line**

Please contact one of our KNF sales engineers (see back of the brochure for a list of KNF subsidiaries).



KNF range of services

- ▶ The relevant reference numbers for the Info-Fax can be found here on the respective page.

Whether for use with neutral or aggressive gases or liquids, the KNF Neuberger range provides the right type of pump. KNF compressors and vacuum pumps carry out transferring, compressing and evacuating tasks, KNF liquid pumps take on transferring and metering jobs.

Applications

The pumps are installed in devices, units and plants in, for example

- the chemical industry
- medical and laboratory equipment
- measuring and analytical systems
- environmental technology
- print technology
- rinsing and cleaning
- research.

Principle of the Diaphragm Pump

An elastomer diaphragm (see illustration) is moved up and down by an eccentric. On the down-stroke it draws the air or gas being handled through the inlet valve.

On the up-stroke the diaphragm forces the medium through the exhaust valve and out of the head. The compression chamber is hermetically sealed from the drive mechanism by the diaphragm. The pumps transfer, evacuate, and compress completely oil-free.

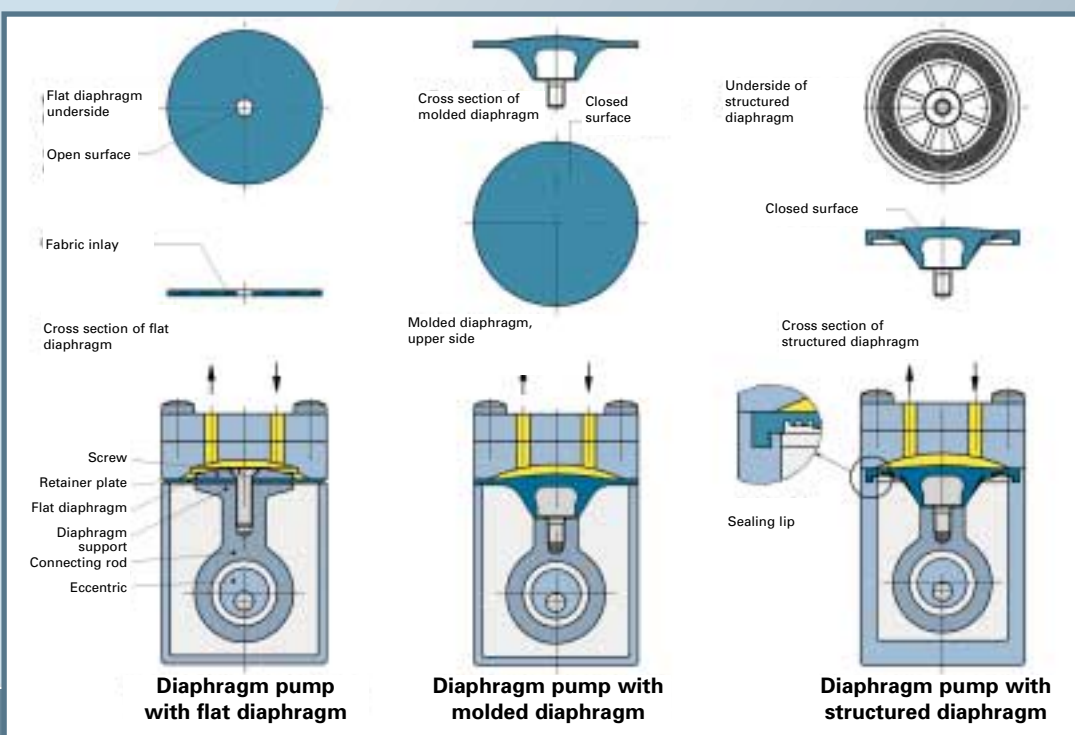
Features of diaphragm pumps

- uncontaminated transfer, no pollution of the media
- 100% maintenance-free
- compact design
- smooth running
- easy installation
- with very few exceptions, the pumps can operate in any installed position

Liquid pumps have the following additional features:

- self-priming
- will operate dry

In addition to the above features, diaphragm pumps for gases have excellent gas tightness.



Diaphragms

Once more KNF has set new standards in diaphragm pump technology with its new stress-optimized, patented structured diaphragms for gas pumps. Major benefits over conventional diaphragms are:

- approximately one third higher output from same size of pump
- longer service life

Valve System

These valves are notable for their clever and robust design. They exhibit:

- high vapour and condensate compatibility
- particularly low velocity loss

Dynamical Mass Balancing

For applications that demand especially smooth running throughout the whole working range of the pump, KNF has developed a dynamical mass balancing. It automatically damps out the out-of-balance that results from gas forces.

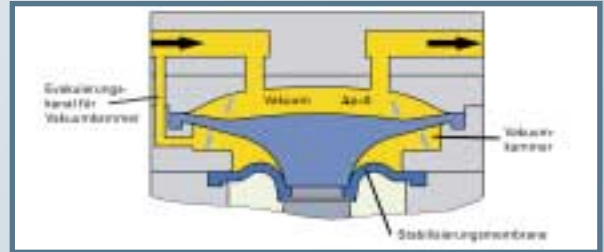
KNF self-drying system

Vacuum pumps for moist gases, for operation with vacuum drying or steam sterilization, are fitted with the KNF self-drying system. The condensate which forms in this situation is automatically blown out of the pump heads.

KNF diaphragm stabilization system

To further improve the suction speed, process reliability and pump-down time of diaphragm roughing pumps, we have developed a diaphragm stabilization system. An additional diaphragm separates the underside of the working diaphragm from the drive chamber of the pump (see illustration). The chamber between the two diaphragms (vacuum chamber) is connected to the suction side of the pump by an evacuation channel.

This means that between both diaphragms virtually the same pressure as in the working chamber is present. The pressure difference between the upper and lower side of the diaphragm approaches zero. The working diaphragm remains stable regardless of the inlet pressure of the pump, so that the pump demonstrates significantly better suction speed over its entire working range.



Metering pumps with stepper motor drive

Diaphragm metering pumps with stepper motor drive meter even the smallest volumes with high accuracy and long-term stable characteristics. The "quasi-continuous flow" and "batch metering" functions open up new possibilities for metering tasks. All systems are self-priming, capable of dry running and maintenance-free.

Overpressure protection

By using an overpressure relief integrated in the pump head to restrict the maximum pressure, .27-versions of liquid pumps provide greater operating safety.

The KNF Modular System

Versatility is one of KNF's strengths. It is illustrated by the KNF modular system. The system comprises an exceptionally large selection of pump heads made from various materials along with a multitude of drive motors. Flexibility - this is standard at KNF.

Special Projects

Most technical requirements which are not met by KNF's standard products are provided by customized product modifications.

Drive Motors made by KNF

KNF pumps are available in most internationally used voltages and frequencies. Several pump series are also available with DC drive. Most pump motors are developed and made by KNF Neuberger, ensuring that the motors are exactly suited to the requirements of the diaphragm pumps.

Pump Principle:

- diaphragm pump

Special Pump Feature:

- depending on the type of pump, the components in contact with media are corrosion-resistant

Applications:

- transfer, evacuation and compression of air and neutral, slightly aggressive and slightly corrosive gases and vapours.
- Vacuum pump for damp gases with KNF self-drying system, for example with vacuum drying or steam sterilization.

Performance Range: Micro Diaphragm Gas Sampling Pumps

- flow rate: from 0.5 l/min up to 4 l/min (at atm. pressure)
- ultimate vacuum: down to 240 mbar abs.
- maximum pressure: up to 1 bar g

Diaphragm Compressors and Vacuum Pumps

- flow rate: up to 300 l/min (at atm. pressure)
- ultimate vacuum: down to 0.5 mbar abs.
- maximum pressure: up to 12 bar g



N 86 KNDC

N 86 KNE

N 85.3 KNDC

Mini diaphragm pumps – easy installation in to devices, units and plants e. g. medical equipment



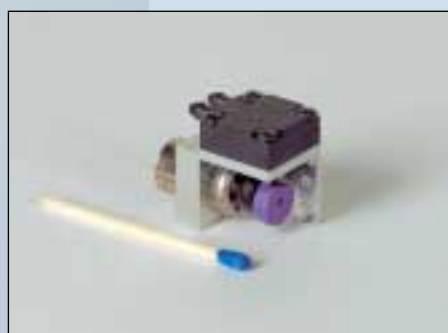
N 836.3 APE
Diaphragm vacuum pump with KNF self-drying system, air- and water-cooled heads for the vacuum drying



N 813.4 ANE
Four head diaphragm vacuum pump e.g. used as roughing pump



N 828 KNDC
Mini diaphragm vacuum pump e.g. for the medical equipment



NMP 05M
Micro diaphragm gas sampling pump e.g. for the analytical technology



Roughing Pumps, Gas Sampling Pumps/ Process Gas Pumps



Roughing Pump

Pump Principle:

- diaphragm pump

Special Pump Features:

- very quiet, low vibration depending on the model,
- some pumps are fitted with a dynamic balancer for specially smooth running

Applications:

- vacuum pumps for contamination-free transfer and evacuation of air and gases
- can be used as a roughing pump for turbomolecular pumps

Performance Range:

- flow rate: up to 80 l/min. (at atm. pressure)
- ultimate vacuum: down to 0,5 mbar abs.
- maximum pressure: up to 1 bar g



N 920 AP.29.18

Diaphragm vacuum pump with KNF diaphragm stabilizing system and adjustable flow rate, e.g. used as a roughing pump or for processes with vacuum applications



N 920 APE

Side-mounted diaphragm vacuum pump with KNF diaphragm stabilizing system, e.g. for easier installation in equipment and systems

Gas Sampling Pumps / Process Gas Pumps

Pump Principle:

- diaphragm pump

Special Pump Features:

- high flow rate
- depending on the model, the medium contact parts of the pump are corrosion resistant

Applications:

- for uncontaminated pumping, evacuating and compressing of air as well as neutral and slightly aggressive or corrosive gases and vapours
- often used as gas sampling and process gas pumps

Performance Range

- flow rate: up to 280 l/min (at atm. pressure)
- ultimate vacuum: down to 20 mbar abs.
- maximum pressure: up to 2 bar g



N 860.3 ANE

Diaphragm vacuum pump, e.g. for use in production with vacuum applications



N 0150 ANE

Single-head diaphragm gas sampling pump, e.g. for measurement and process gas analysis



N 0150.1.2 ANE

Two-stage diaphragm gas sampling pump, e.g. for measurement and process gas analysis





Pump Principle:

- diaphragm pump

Special Pump Features:

- the pumps are chemically-resistant because the components in contact with the media are resistant to aggressive gases and vapours. KNF pump heads are made of e.g. PTFE and ceramic, the valves are in FFPM, and the diaphragms are protected by a PTFE coating.

Applications:

- Universal use for uncontaminated pumping, evacuating and compressing aggressive gases and vapours, e.g. as gas sampling and process gas pumps

Performance Range:

- flow rate: up to 230 l/min. (at atm. pressure)
- ultimate vacuum: down to 40 mbar abs.
- maximum pressure: up to 1.5 bar g

Chemically-resistant laboratory pumps

A series of portable chemically-resistant vacuum pumps complete the product line: The LABOPORT® pumps.

Performance Range

- flow rate: up to 60 l/min (at atm. pressure)
- ultimate vacuum: down to 2 mbar abs.



N 1400.3 CT.9E
Ceramic head diaphragm sampling pump for flow rate to 230 l/min



N 726 FT.29 E
Pump with integral bypass-valve in the pump head, chemically resistant



N 87 TTE
Chemically-resistant mini-diaphragm gas sampling pump, e.g. for use in gas analysis



A selection of LABOPORT® laboratory pumps

To see the entire line of laboratory pumps, ask for our KNF Lab Catalog.

Temperature-resistant and heated Diaphragm Compressors and Vacuum Pumps for Gases and Vapours

Pumpenprinzip:

- diaphragm pump

Special Pump Features:

- head components in contact with the media are resistant to maximum temperature of 240 °C
- pumps with heated head: pump heads are heated to a maximum of 240 °C - either to a fixed maximum temperature or to a set temperature (pumps with electronic temperature control). Heating prevents condensation of gas

Applications:

- uncontaminated transfer, evacuation and compression of (depending on model) air and neutral, slightly aggressive or slightly corrosive gases and vapours at temperatures of maximum 240 °C
- pumps with heated head: Where for purposes of analysis, gases must not condense.

Performance Range:

- flow rate: up to 100 l/min (at atm. pressure)
- ultimate vacuum: down to 180 mbar abs.
- maximum pressure: up to 1.5 bar g



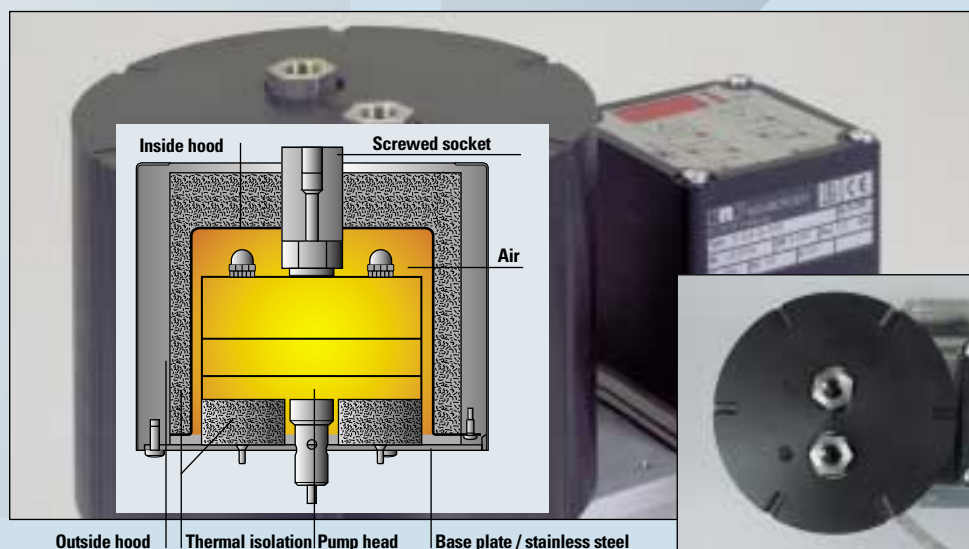
N 0100 ST.11. E
Diaphragm pump with heated head and fixed temperature, flow rate up to 100 l/min



N 86 ST. 16 E
Mini-diaphragm pump with temperature-resistant pump head



N 026 FT.16 E
Temperature-resistant pump as chemically-resistant type



N 024 ST.26 E
Heated diaphragm pump with patented insulation (see section drawing). Electronic temperature control by panel with display



Diaphragm Compressors and Vacuum Pumps for use with hazardous or valuable Gases and Vapours, Ex-Pumps to ATEX

Pump Principle:

- diaphragm pump
- double diaphragm system (see illustration). A second diaphragm is located underneath the working diaphragm. This second diaphragm is under less mechanical stress when the pump is operating. If gas should leak at the working diaphragm, it will still remain inside the pump space. The space between both diaphragms can be monitored so that any damage to the working diaphragm will be noted immediately

Special Pump Feature:

- greatly increased safety by double diaphragm system
- Versions for explosion-proof applications - explosion protection for the motor and pump (electrical and mechanical explosion protection)

Application:

- transfer, evacuation and compression of neutral, slightly aggressive and slightly corrosive gases and vapours
- especially suitable where safety and gas tightness are essential, e.g., with toxic, radioactive or particularly expensive gases.

Performance Range:

- flow rate: up to 280 l/min (at atm. pressure)
- ultimate vacuum: down to 3 mbar abs.
- maximum Pressure: up to 3 bar g



N 87 TTE-Ex
Chemically-resistant mini-diaphragm gas sampling pump with ATEX rating



Double diaphragm pump with double safety feature: Safety diaphragm and explosion protection for the entire pump to ATEX.

- 1 Diaphragm head
- 2 Compression space
- 3 Working diaphragm
- 4 Spacer ring
- 5 Safety space
- 6 Safety diaphragm
- 7 Crankcase
- 8 Eccentric housing
- 9 Connecting rod
- 10 Diaphragm support
- 11 Inlet valve
- 12 Outlet valve



- ▶ 19 = Diaphragm Compressors and Vacuum Pumps for use with hazardous or valuable Gases and Vapours
- 20 = Diaphragm Pumps in explosion protection to ATEX

Swing Piston Compressors and Vacuum Pumps for use with Air

Pump Principle:

- swing piston pump (see illustration below). As it rises and falls, the piston tilts first to one side, and then to the other. Similar to the diaphragm pump, the compression forces act along the axis of the connecting rod, so that there is no radial force acting against the cylinder wall to cause wear. In contrast to the diaphragm principle, the piston has a lip seal. Thanks to this sealing lip the swing piston pump runs dry and 100% oil-free

Special Pump Features:

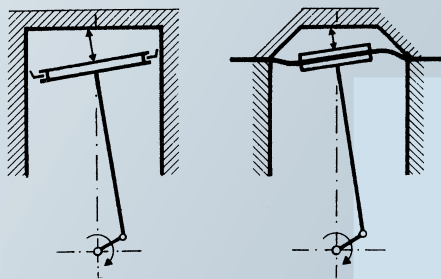
- 100% oil-free compressed air and vacuum
- maintenance-free
- high flow rate and small size
- long service life

Applications:

- transfer, evacuation and compression of air e.g. medical technology

Performance Range:

- flow rate: up to 78 l/min (at atm. pressure)
- ultimate vacuum: down to 80 mbar abs.
- maximum pressure: up to 7 bar g



Pump Principle

Swing piston pump Diaphragm pump



NPK 0100
Flow rate up to
78 l/min



NPK 050
Flow rate up to
50 l/min



NPK 09.1.2
Flow rate up to
24 l/min
and pressure up
to 7 bar



NPK 018 DC
Flow rate up to
18 l/min





Micro Diaphragm Liquid Pumps



Special Pump Features:

- micro design and maximum performance – micro-diaphragm liquid pumps are suitable for the transfer of small quantities of liquids.
- the use of chemically-resistant materials, e.g., PP, PPS, PVDF, PTFE, FFPM and other material combinations allows the pumps to be used for the transfer of almost all neutral or aggressive substances
- self-priming, will operate dry

Performance Range:

- flow rate: from 0.05 l/min to 0.6 l/min per head (water at 20 °C and zero pressure head). Tandem pumps and pumps with several heads have multiple features
- suction head: up to 6m WG
- pressure Head: up to 60m WG



NF 5
The smallest motor-driven diaphragm liquid pump



NF 10 KTDC
Compact micro-diaphragm liquid pump



NF 1.11
The high-pressure capacity, micro-diaphragm liquid pump

Diaphragm Liquid Pumps for neutral and aggressive Liquids

Diaphragm Liquid Pumps

Pump Principle:

- diaphragm pump

Special Pump Features:

- chemically resistant due to the use of PVDF, PTFE or PP, PPS, FFKM, EPDM for liquid contacting parts
- design option with or without integrated over-pressure relief
- self-priming, will operate dry

Applications:

- transfer of neutral and aggressive liquids

Performance Range:

- flowrate: from 1.0 l/min to 3.0 l/min per head (water at 20 °C and zero pressure head)
- suction head: up to 4m WG
- pressure head: up to 60m WG



NF 100 KTE
Diaphragm liquid
pump with AC
motor



NF 30 KPDCB
Diaphragm liquid
pump with brush-
less DC motor



NF 1.300 KT.27 DC
Diaphragm
liquid pump
with integrated
overpressure
restrictor and
DC motor

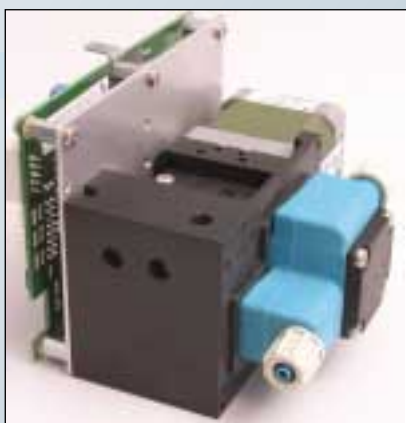
Diaphragm Metering Pump with Microprocessor

The FEM Diaphragm Metering Pump is a remarkably simple design.

A micro-processor, which links KNF's pumps know-how with the possibilities offered by modern electronics and motor technology, controls the metering unit. This provides the user with a range of ways in which the pump can be used, but also offers interesting possibilities of harnessing the operating characteristic of the pump.

Pumps in the FEM product range meter continuously and smoothly even at very low speed. The stepper motor is the key to this achievement - during the suction stroke it always runs at maximum speed, and only changes to the preset speed for the delivery stroke.

In addition, the motor speed is continuously regulated to make the delivery rate as smooth as possible during every single stroke.



Diaphragm Metering Pump FEM 1.08 KPRC



Pump Principle:

- diaphragm pump

Special Pump Features:

- continuous smooth metering even at slowest speed
- low pulsation
- numerous operating functions
- choice of manual, analogue, or digital control of flow rate
- special drive technology for exceptionally wide metering range
- excellent resistance to chemicals
- self-priming, will operate dry
- Accuracy $\pm 2\%$
- Repeatability $\pm 1\%$

Applications:

- processor-controlled metering of neutral and aggressive media

Performance Range:

- flow rate: 0,03 ml/min to 80 ml/min (water at 20 °C and zero pressure head)
- minimal metering volume: 30 μ l
- suction head: up to 4m WG
- pressure head: up to 60m WG



Diaphragm pressure control valves and diaphragm pulsation damper complete the KNF range of products.

Diaphragm Pressure Control Valves

serve to produce a constant back pressure for neutral and aggressive liquids and gases.

They can be used to achieve a more accurate control of flow against fluctuating back pressure and metering into a vacuum or from a pressurized system. These valves can also be used as off-loading valves for the protection of pumps, fittings or systems. The selected pressure is applied to the adjustable spring loaded diaphragm and thus to the system.

KNF diaphragm pressure control valves are adjustable up to 6.5 bar g.

The Diaphragm Pulsation Damper

Will strongly reduce the pulsation on the outlet side of the pump up to 97%. Please note that the damper has to be selected and installed correctly in order to ensure the optimal performance.

Special features

- High chemical resistance
The use of chemically resistant materials such as PVDF, FFKM, EPDM, PP e.t.c. for all wetted parts allows almost all neutral and corrosive liquids to be pumped.
- Durable and maintenance free
The carefully considered design of this very compact pulsation damper and pressure control valves ensures safe operation and a long life even under the most severe condition.



Adjustable diaphragm pressure control valves



Adjustable diaphragm pressure control valve for higher flow rate



Diaphragm pulsation damper for reducing vibration in the lines



► **Sender**

- Please use the fast Info Service by fax.
- The information material contains comprehensive technical details on the appropriate product range.
- Please tick the appropriate reply numbers for those product groups in which you are interested.

Company	:	
Name	:	
Position	:	
Street	:	
Postcode, City	:	
Tel. No.	:	
Fax No.	:	
E-Mail	:	

► **Product range**

► **Reply No.**

■ **Gas Pumps**

- | | | |
|--------------------------|----------------------------------------------------------------------------------------------------------------------|----|
| <input type="checkbox"/> | Micro Diaphragm Gas Sampling Pumps | 11 |
| <input type="checkbox"/> | Diaphragm Compressors and Vacuum Pumps for Gases and Vapours | 12 |
| <input type="checkbox"/> | Roughing Pumps | 13 |
| <input type="checkbox"/> | Gas Sampling Pumps / Process Gas Pumps | 14 |
| <input type="checkbox"/> | Chemically-resistant Diaphragm Compressors and Vacuum Pumps for Gases and Vapours | 15 |
| <input type="checkbox"/> | Portable, chemically-resistant Vacuum Pumps for Gases and Vapours | 16 |
| <input type="checkbox"/> | Temperature-resistant Diaphragm Compressors and Vacuum Pumps for Gases and Vapours | 18 |
| <input type="checkbox"/> | Diaphragm Compressors and Vacuum Pumps for use with hazardous or valuable Gases and Vapours (Double Diaphragm Pumps) | 19 |
| <input type="checkbox"/> | Diaphragm Pumps in explosion protection to ATEX | 20 |
| <input type="checkbox"/> | Swing Piston Compressors and Vacuum Pumps for use with Air | 21 |

■ **Liquid Pumps**

- | | | |
|--------------------------|---------------------------------------------------------------------------------|----|
| <input type="checkbox"/> | Micro-Diaphragm Liquid Pumps for neutral and aggressive Liquids | 32 |
| <input type="checkbox"/> | Diaphragm Liquid Pumps for neutral and aggressive Liquids | 33 |
| <input type="checkbox"/> | Diaphragm Metering Pumps with Microprocessor for neutral and aggressive Liquids | 34 |

■ **Accessories for Liquids and Gases**

- | | | |
|--------------------------|-----------------------------------|----|
| <input type="checkbox"/> | Diaphragm Pressure Control Valves | 41 |
| <input type="checkbox"/> | Diaphragm Pulsation Damper | 42 |

■ **Laboratory Pumps and Systems**

- | | | |
|--------------------------|----------------------------------------------------------------------------|----|
| <input type="checkbox"/> | KNF Lab Catalog: The complete product line of laboratory pumps and systems | 16 |
|--------------------------|----------------------------------------------------------------------------|----|



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