You have selected a high-quality KNF product; the following tips will help you operate it safely, and reliably over a long period of time. Carefully study the operating instructions before using the pumps and observe at all times the relevant instructions to avoid dangerous situations. The manual was produced for the serial pumps stated above. Within customer-specified projects (pump types starting with "PJ" or "PM") there could be differences in detail. For customer-specified projects please therefore take into account any agreed technical specifications, as well as these instructions.

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3. Installation
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7. Spare Parts
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1. Description, Operating Conditions

KNF pumps in the range N 86 K_.18, N 811 K_.18, N 816 K_.18 and N 838 K_.18 transfer, evacuate, and compress 100 % oil-free. In operation they are gas-tight, and maintenance-free.

1.1 Electrical Equipment

- See table 1 for full electrical data.
- The protection class of standard versions is IP 20.
- The pumps are fitted with a thermal-switch to protect against over-loading.

1.2 Operating Conditions

- Handling air, gases, and vapours at temperatures between +5 °C...+40 °C.
- For maximum permissible operating pressure, ultimate vacuum, and flow capacity: see table 2.
- The pumps must not be used in areas where there is a danger of explosion.
- The pumps must not be used for liquids. You will find suitable liquid pumps in our Product Program.
- For vacuum pumps: The gas discharge at the pressure side must be drained off safely and reliably.
- Before pumping a medium, the compatibility of materials of pump head, diaphragm and valves with the medium must be checked (for pump materials: see table 3).
- Pumps that may be employed as vacuum pump and compressor must not be used to produce vacuum and pressure at the same time.

If your potential application lies outside the above limits discuss it with our technical adviser (see last page for contact telephone number).

1.3 Ambient Condition

When the pumps are operating the following ambient conditions must be maintained:

- Ambient temperature during operation: between +5 °C...+40 °C.
- During operation an adequate supply of air for cooling must be provided.
- The pumps must not be used in areas where there is a danger of explosion.

1.4 Pump materials

See table 3.

2. Safety

- Note that the pumps may only be used for their intended purpose.
- The pumps must not be used in areas where there is a danger of explosion.
- For vacuum pumps: The gas discharge at the pressure side must be drained off safely and reliably.
- Components connected to the pumps must be designed to withstand the pneumatic performance of the pumps (see table 2).
- Plug the pump only into properly installed grounded outlets.
- When the operation of the pump is interrupted by the thermal switch, the pump will re-start automatically after cooling down. Take all care necessary to prevent this leading to a dangerous situation.
- Specific safety instructions and measures for the medium being handled must be observed.
- Use only original KNF spare parts.

- The pumps conform to the safety regulations of the EC Low Voltage Directive 73/23 EEC, and of the EC Directive 89/336 EEC concerning Electromagnetic Compatibility. The requirements of the following harmonized standards are fulfilled: EN 61010 part 1, EN 50081 part 1, EN 50082 part 1.

3. Installation

- Choose a safe location (flat surface) for the pump.
- Install the pump so as to ensure adequate flow of air cooling.
- Fit the pump at the highest point in the system, so that condensate cannot collect in the head of the pump - that prolongs working life of structured diaphragm and pump.
- At the pump head (for double-head pumps: at the pump heads), remove the protection plugs from the hose connectors.
- Mounting the accessory parts filter or silencer (if present): If the pump is used as a compressor (not permitted with series N 816 K_.18 and N 838 K_.18), mount a filter at the suction side if necessary.
- Before mounting the filter or silencer, unscrew the corresponding hose connector from the threads in the pump head.
- Connect the suction and pressure lines (N 86 K_.18: tube ID 4 mm; N 811 K_.18, N 816 K_.18: ID 6 mm and N 838 K_.18: ID 10 mm). For flow direction see marking on the pump head.
- Arrange the suction and pressure lines so that condensate cannot run into the pump (sloping lines).

2. Safety

- Note that the pumps may only be used for their intended purpose.
- The pumps must not be used in areas where there is a danger of explosion.
- For vacuum pumps: The gas discharge at the pressure side must be drained off safely and reliably.
- Components connected to the pumps must be designed to withstand the pneumatic performance of the pumps (see table 2).
- Plug the pump only into properly installed grounded outlets.
- When the operation of the pump is interrupted by the thermal switch, the pump will re-start automatically after cooling down. Take all care necessary to prevent this leading to a dangerous situation.
- Specific safety instructions and measures for the medium being handled must be observed.
- Use only original KNF spare parts.

4. Operation

- The pumps can be switched on and off using the power switch.
- Specific safety instructions for the medium being handled must be observed.
- If combustible media are used: Hazard of fires and explosions due to excessively high media temperature.
- Be aware that the pumps are not designed to be explosion-proof.
- Make sure the temperature of the medium is always sufficiently below the ignition temperature of the medium, to avoid ignition or explosion. This also applies for unusual operational situations.
- Note that the temperature of the medium increases when the pump compresses the medium.
- Hence, make sure the temperature of the medium is sufficiently below the ignition temperature of the medium, even when it is compressed to the maximum permissible operating pressure of the pump.
- The maximum permissible operating pressure of the pump is stated in the technical specifications (table 1). If necessary, consider any external sources of energy, such as radiation, that may add heat to the medium.
- In case of doubt, consult the KNF customer service.
- Before pumping a medium, the compatibility of materials of pump head, diaphragm, and valves with the medium must be checked (for pump materials: see table 3).
- The pumps must not start against pressure or vacuum. This also applies when the pump restarts after the power has been cut off for a short period. If a pump starts under pressure or vacuum, then the thermal switch will be activated and switch the pump off.
- When the operation of the pump is interrupted by the thermal switch, the pump will re-start automatically after cooling down. Take all care necessary to prevent this leading to a dangerous situation.
- The maximum permissible operating pressure (see table 2) must not be exceeded. Exception: if the data sheets include values for intermittent operation, they may employed briefly.
- To prevent the maximum permissible operating pressure being exceeded, restriction or control of the air or gas flow should only be
carried out in the suction line.

- If restriction or control of the air or gas flow is made on the pressure side ensure that the maximum permissible operating pressure is not exceeded. Excessive pressure (with all of the related hazards) can be prevented by placing a bypass line with a pressure-relief valve between the pressure and suction sides of the pump. For further information, contact our specialists (telephone number: see last page).
- When the pump is at a standstill the inlet and exhaust must be at normal atmospheric pressure.
- Change the filter (accessory) if it is dirty.

Pumps that may be employed as vacuum pump and compressor must not be used to produce vacuum and pressure at the same time.

Diaphragm and valve plates (valve plates/sealings) are the only parts subject to wear. Wear is usually indicated by a drastic reduction in the pneumatic performance (vacuum, pressure, delivery). When replacing parts proceed as described in section 5.

Ambient conditions: see chapter 1.3.

Versions with fine-adjustment valve

The flow volume of the pump can be regulated at the valve knob of fine-adjustment valve (see position (1) in fig. 6).

5. Servicing

⚠️ Before working on the pump, disconnect it from the electricity supply by pulling the plug out.

- Diaphragm and valve plates (valve plates/sealings) are the only parts subject to wear. They are simple to change.
- Always change diaphragm, sealing rings and valve plates (valve plates/sealings) at the same time. In the case of models with two pump heads service both heads at the same time. If the diaphragm is not changed in both heads at the same time or the diaphragm and the valve plates (valve plates/sealings) are not changed at the same time the nominal performance of the pump is not guaranteed after the service.

- If aggressive, toxic or other types of gases hazardous to health have been pumped please observe:
  1. Clean the pump and its components before servicing.
  2. Ensure that the service personnel is not subject to a health hazard during diaphragm and valve plate changes. Apply the necessary safety measures (example: the use of protective gloves).
  3. Ensure that the discarded parts and materials are safely and correctly disposed of.

5.1.1 N 86 K_.18

Parts/tools required:
- Service Set (see section 8)
- Philips-head screwdriver No. 1
- Small screwdriver
- Pencil

Changing the structured diaphragm, valve plates, and sealing rings in the following sequence:

a) Remove pump head
b) Change structured diaphragm
c) Change valve plates and sealing rings
d) Refit pump head

See figs. 7 and 8.

a) Removing pump head

1. Mark the position of head plate 3, cover 5 and cover plate 6 relative to each other by a drawing line with a pencil. This helps avoid incorrect assembly later.
2. Undo the 4 screws 4 in the head plate and lift the head plate with the cover 5 off the pump housing.
3. Mark the position of intermediate plate 2 and housing 1 relative to each other by a drawing line with a pencil.
4. Lift the intermediate plate 2 off the housing 1.

b) Change structured diaphragm

1. Using a small screwdriver, between the housing 1 and the outer edge of the structured diaphragm 9, carefully lever the edge of the diaphragm lightly upwards.
2. Grip the structured diaphragm 9 on opposite sides, unscrew it about two turns (anti-clockwise).
3. Hold the pump with one hand, so that the head is pointing downwards. Turn the structured diaphragm 9 anti-clockwise to unscrew it.
4 Take the diaphragm support ⑨ and diaphragm spacer(s) ⑩ off the threaded portion of the diaphragm and retain them.

5 Check that all parts are free from dirt and clean them if necessary (see section 6. Cleaning).

6 Put the diaphragm support ⑨ and diaphragm spacer(s) ⑩, in that order, on the threaded portion of the new structured diaphragm ⑩.

7 Screw the new structured diaphragm ⑩, complete with diaphragm support ⑨ and diaphragm spacer(s) ⑩ into the connecting rod (clockwise) and tighten it by hand.

Change the valve plates/sealings

1 Remove the valve plates① and sealing rings② from the intermediate plate ② (sealing rings could cling to the head plate).

2 Check that the valve seats in the head plate③ and intermediate plate② are clean. If scratches or distortion are evident on these parts they should be replaced.

3 Lay the new valve plates① in the recesses in the intermediate plate②. The valve plates for suction and pressure sides are identical, as are upper and lower sides of the plates.

4 Check that the valve plates① are not deformed by moving them gently sideways in their recesses.

5 Lay the new sealing rings② on the intermediate plate ②.

Refit the pump head

1 Place the intermediate plate②, with valve plates① and sealing rings② on the housing①, in the position indicated by the drawing line.

2 Place the head plate③, with cover⑤ on the housing①, in the position indicated by the drawing line.

3 Check that the head plate③ is centred by moving it gently sideways.

4 Tighten the screws④, evenly and diagonally, first gently, then firmly.

If you have any questions about servicing call our technical adviser (see last page for contact telephone number).

5.1.2 N 811 K_.18

Parts/tools required:

- Service Set (see section 8)
- Phillips-head screwdriver No. 1
- Small screwdriver
- Pencil

Changing the structured diaphragm and valve plates/sealings in the following sequence:

a) Remove pump head

b) Change structured diaphragm

c) Change valve plates/sealings

d) Refit pump head

See figs. 9 and 10.

Removing pump head

1 Mark the position of head plate③, intermediate plate②, cover⑤ and cover plate⑥ relative to each other by a drawing line with a pencil. This helps avoid incorrect assembly later.

2 Undo the 4 screws④ in the head plate③ and lift the head plate together with intermediate plate② off the pump housing.

b) Change structured diaphragm

1 Using a small screwdriver, between the housing① and the outer edge of the structured diaphragm⑩, carefully lever the edge of the diaphragm lightly upwards.

2 Grip the structured diaphragm⑩ on opposite sides, unscrew it about two turns (anti-clockwise).

3 Hold the pump with one hand, so that the head is pointing downwards. Turn the structured diaphragm⑩ anti-clockwise to unscrew it.

4 Take the diaphragm support⑨ and diaphragm spacer(s)⑩ off the threaded portion of the structured diaphragm⑩ and retain them.

5 Check that all parts are free from dirt and clean them if necessary (see section 6. Cleaning).

6 Put the diaphragm support⑨, and diaphragm spacer(s)⑩ in that order, on the threaded portion of the new structured diaphragm⑩.

7 Screw the new structured diaphragm⑩, complete with diaphragm support⑨ and diaphragm spacer(s)⑩ into the connecting rod (clockwise) and tighten it by hand.

Changing the valve plates/sealings

1 Remove the valve plates/sealings① from the intermediate plate②.

2 Check that the valve seats in the head plate③ and intermediate plate② are clean. If scratches or distortion are evident on these parts they should be replaced.

3 Lay the new valve plates/sealings① in the recesses in the intermediate plate②. The valve plates/sealings for suction and pressure sides are identical, as are upper and lower sides of the valve plates/sealings.

4 Check that the valve plates/sealings① are not deformed by moving them gently sideways in their recesses.

d) Refitting the pump head

1 Place the intermediate plate ②, with valve plates/sealings ① on the housing ①, in the position indicated by the drawing line.

Fig. 9: N 811 K_.18

Specification

① Housing
② Intermediate plate
③ Head plate
④ Screw
⑤ Cover
⑥ Cover plate
⑦ Valve plates/sealings
⑧ Structured diaphragm
⑨ Diaphragm support
⑩ Diaphragm spacer(s)
⑪ Connecting rod

Fig. 10: N 811 K_.18
cated by the drawing line. Place the head plate, with cover on the housing, in the position indicated by the drawing line. Check that the head plate is centred by moving it gently sideways. Tighten the screws, evenly and diagonally, first gently, then firmly.

If you have any questions about servicing call our technical adviser (see last page for contact telephone number).

5.1.3 N 816_K_.18

Parts and tools required
- Service Set (see section 8)
- Phillips screwdriver no. 2
- Small screwdriver (blade width 0.5 mm)
- Pencil

Change the structured diaphragms and valve plates/sealings in the following sequence:

a) Remove pump heads
b) Change structured diaphragms
c) Change valve plates/sealings
d) Refit pump heads

Proceed as follows (see figs. 11, 12 and 13):

a) Remove pump heads
1. At both pump heads: Mark the position of head plate, intermediate plate, cover and housing relative to each other by a drawing line (M) with a pencil. This helps avoid incorrect assembly later.
2. At both pump heads: Undo the 4 screws in the head plate.
3. Remove both pump heads (each consisting of a head plate and intermediate plate) together from the pump housing.

b) Change structured diaphragms (for each pump head separately)
1. Push down one structured diaphragm to bring the other structured diaphragm to top dead centre.
2. Lift the edge of the highest structured diaphragm and, gripping it on opposite sides, unscrew it by turning anti-clockwise.
   ▶ Make sure the diaphragm spacers on the thread of the structured diaphragm do not fall into the pump housing.
3. Take the diaphragm spacers off the threaded portion of the structured diaphragm and retain them.
4. Check that all parts are free from dirt and clean them if necessary.

The curved part of the disk spring must be aligned to the pump head (see figure).

The number of diaphragm spacers can vary

Specification

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intermediate plate</td>
</tr>
<tr>
<td>2</td>
<td>Valve plate/sealing</td>
</tr>
<tr>
<td>3</td>
<td>Head plate</td>
</tr>
<tr>
<td>4</td>
<td>Screw</td>
</tr>
<tr>
<td>5</td>
<td>Screw cap</td>
</tr>
<tr>
<td>6</td>
<td>Screw</td>
</tr>
<tr>
<td>7</td>
<td>Sealing*</td>
</tr>
<tr>
<td>8</td>
<td>O-ring*</td>
</tr>
<tr>
<td>9</td>
<td>Connecting tube*</td>
</tr>
<tr>
<td>10</td>
<td>Structured diaphragm</td>
</tr>
<tr>
<td>11</td>
<td>Diaphragm spacer</td>
</tr>
<tr>
<td>12</td>
<td>Cover</td>
</tr>
<tr>
<td>13</td>
<td>Housing</td>
</tr>
<tr>
<td>14</td>
<td>Disk spring</td>
</tr>
<tr>
<td>15</td>
<td>Washer</td>
</tr>
<tr>
<td>16</td>
<td>Spring Washer</td>
</tr>
<tr>
<td>17</td>
<td>Washer</td>
</tr>
</tbody>
</table>

M: Mark

* only for N 816.3 K_.18 and N 816.3 K_.45.18
3. Put the diaphragm spacers ③ on the thread of the new structured diaphragm ②.
4. Push down the structured diaphragm ② of the second pump head until the connecting rod (connecting part between motor shaft and structured diaphragm) is at top dead centre.
5. Screw the new structured diaphragm ②, complete with diaphragm spacers ③, into the connecting rod (clockwise) and tighten it by hand.
6. Carry out steps ① to ⑦ for the second pump head.

Change valve plates/sealings (for each pump head separately)

1. Only for pumps N 816.3 KN.18 and N 816.3 KT.18: Pull the connecting tube ① out of one of the two head plates ④; take care to ensure that the sealing ⑤ and the O-ring ⑥ are not lost.
2. For one pump head: Use a small screwdriver to undo the two screw caps ⑥ on the pump head and then undo the screws ⑦.
3. Separate the head plate ④ from intermediate plate ①.
4. Remove the valve plates/sealings ② from the intermediate plate ①.
5. Check that the valve seats, the head plate ④, and intermediate plate ① are clean; if scratches or distortion are evident on these parts they should be replaced.
6. Lay the new valve plates/sealings ② in the recesses in the intermediate plate ①. The valve plates/sealings for suction and pressure sides are identical, as are upper and lower sides of the valve plates/sealings.
7. Check that the valve plates/sealings ② are not deformed by moving them gently sideways in their recesses.
8. Place the head plate ④ on the intermediate plate ①, in the position indicated by the marking (M).
9. Check that the head plate ④ is centred by moving it gently sideways.
10. Join the head plate ④ and the intermediate plate ①:
    a) Tighten the two screws ⑦ (tightening torque: 70 Ncm)
    b) For placement of disk spring ⑥ and washer ⑧ and for orientation of disk spring see fig. 12.
11. Install the screw caps ⑥.
12. Carry out steps ① to ⑦ for the second pump head.

Change structured diaphragms (for each pump head separately)

1. Push down one structured diaphragm ② to bring the other structured diaphragm to top dead centre.
2. Lift the edge of the highest structure diaphragm ② and, gripping it on opposite sides, unscrew it by turning anti-clockwise.
3. Make sure the diaphragm spacers ③ on the thread of the new structured diaphragm ② do not fall into the pump housing.
4. Take the diaphragm spacers ③ off the threaded portion of the structured diaphragm ② and retain them.
5. Check that all parts are free from dirt and clean them if necessary (see section 6. Cleaning).
6. Put the diaphragm spacers ③ on the thread of the new structured diaphragm ②.
7. Push down the structured diaphragm ② of the second pump head until the connecting rod (connecting part between motor shaft and structured diaphragm) is at top dead centre.
8. Screw the new structured diaphragm ②, complete with diaphragm spacers ③, into the connecting rod (clockwise) and tighten it by hand.
9. Carry out steps ① to ⑦ for the second pump head.

Change valve plates/sealings (for each pump head separately)

1. For one pump head: Use a small screwdriver to undo the two screw caps ⑥ on the pump head and then undo the screw ⑦.
2. Separate the head plate ④ from intermediate plate ①.
3. Remove the valve plates/sealings ② from the intermediate plate ①.
4. Check that the valve seats, the head plate ④, and intermediate plate ① are clean; if scratches or distortion are evident on these parts they should be replaced.
5. Lay the new valve plates/sealings ② in the recesses in the intermediate plate ①. The valve plates/sealings for suction and pressure sides are identical, as are upper and lower sides of the valve plates/sealings.
6. Check that the valve plates/sealings ② are not deformed by moving them gently sideways in their recesses.
7. Place the head plate ④ on the intermediate plate ①, in the position indicated by the marking (M).
8. Check that the head plate ④ is centred by moving it gently sideways.
9. Join the head plate ④ and the intermediate plate ①:
    a) Tighten the two screws ⑦ (tightening torque: 70 Ncm)
    b) For placement of disk spring ⑥ and washer ⑧ and for orientation of disk spring see fig. 15.
Install the screw caps (6).

Carry out steps (1) to (5) for the second pump head.

d) Refit pump heads

Place the two pump heads that are joined by the pneumatic connecting tube(s) on the housing according to the markings (M).

- Make sure the cover (13) is placed on the pump head and is not jammed. For this, carefully slide a small screwdriver between the cover (13) and the pump head.
- If the cover is jammed between the intermediate plate (1) and head plate (2), then the pump will not provide the nominal pneumatic performance.

On both pump heads:
- Gently tighten the screws (5), evenly and diagonally (tightening torque: 3 Nm).

If you have any questions about servicing call our technical adviser (see last page for contact telephone number).

6. Cleaning

- When changing structured diaphragm(s) and valve plates (valve plates/sealings), inspect all parts for dirt before assembling the pump head and clean them if necessary.

- As far as possible, clean the parts with a dry cloth. Only use solvents for cleaning if the head materials cannot be attacked (check the resistance of the materials).

7. Trouble Shooting

**⚠️ Before working on the pump isolate the power supply securely, then check that the lines are not live.**

- The following tips for fault-finding are best employed in the sequence shown.

**Pump produces no flow**

- Thermal switch has opened due to over-heating.
  - Disconnect pump from mains and allow to cool. Trace cause of over-heating and eliminate it.

- Fuses in the pump are defective (only authorized/qualified personnel should investigate this problem)
  - Remove the pump from the source of electrical power by pulling the power plug.

- At the pump housing, fuses are located at the IEC plug (except for pump types N 816._K_.18; fuses are located in the housing, and can be accessed by removing the fan cover, and for pump
types N 838. K..18: fuses are located in the housing, and can be accessed by removing the terminal box plate on the bottom of the pump).

- Fuse ratings: see Table 1.
- Order numbers for fuses: see Chapter 8.
- Connections or lines are blocked.
- An external valve is closed, or a filter blocked.
- Liquid (condensate) has collected in the pump head.
- Let the pump run for a few minutes pumping air (if necessary for safety reasons: pumping an inert gas.)
- Install the pump at the highest point in the system.
- Diaphragms or valve plates (valve plates/sealings) are worn.
- Section 5 Servicing.

Flow, pressure, or vacuum too low
- Compare the actual performance with the figures in table 2 or the data sheet.
- There is pressure on the pressure side, and at the same time vacuum, or a pressure above atmospheric, on the suction side.
- The pump is not designed for this condition.
- Liquid (condensate) has collected in the pump head.
- Let the pump run for a few minutes pumping air (if necessary for safety reasons: pumping an inert gas.)
- Install the pump at the highest point in the system.
- The cross-section of pneumatic lines, or connected components is too small, or they are restricted.
- To measure the performance, disconnect the pump from the system (small diameter tubing or a valve can significantly affect performance).
- There is a leak at a connector, in a line, or in the pump head.
- Diaphragms or valve plates (valve plates/sealings) are worn, or dirt is in the head.
- Section 5 Servicing.

If the pump does not operate properly and you cannot find any of the above faults, send it to the KNF Service Department.

In order for KNF to repair the pump, the customer must provide a statement on the media which were pumped and on pump cleaning. Please fill out the corresponding KNF form, and submit it together with the pump. A sample statement for copying can be found in the Appendix of these operating instructions.

8. Replacement Parts
A Service Set contains all replacement parts needed for one complete service. For the pump range N 86: 1 structured diaphragm, 2 valve plates and 2 sealing rings; for the pump range N 811: 1 structured diaphragm and 2 valve plates/sealings; for the pump ranges N 816 and N 838: 2 structured diaphragms and 4 valve plates/sealings.

<table>
<thead>
<tr>
<th>Pump type</th>
<th>Order-No.</th>
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<tbody>
<tr>
<td>N 86 KN.18</td>
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<tr>
<td>N 86 KT.18</td>
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<tr>
<td>N 811 KN.18</td>
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<td>N 816.1.2 KN.18</td>
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</tr>
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Fuses
There are two fuses for each pump.

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<th>Pump range</th>
<th>Order-No. fuse</th>
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<tbody>
<tr>
<td>N 86 K..18, 230 V</td>
<td>025250</td>
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<tr>
<td>N 86 K..18, 115 V</td>
<td>029986</td>
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<tr>
<td>N 86 K..18, 100 V</td>
<td>020085</td>
</tr>
<tr>
<td>N 811 K..18, 230 V</td>
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<tr>
<td>N 811 K..18, 115 V</td>
<td>029986</td>
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<tr>
<td>N 811 K..18, 100 V</td>
<td>020085</td>
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<tr>
<td>N 816. K..18, 230 V</td>
<td>025250</td>
</tr>
<tr>
<td>N 816. K..18, 115 V</td>
<td>027576</td>
</tr>
<tr>
<td>N 816. K..18, 100 V</td>
<td>027575</td>
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<td>025250</td>
</tr>
<tr>
<td>N 838. K..18, 115 V</td>
<td>020255</td>
</tr>
<tr>
<td>N 838. K..18, 100 V</td>
<td>027576</td>
</tr>
<tr>
<td>N 838. K..18, 220 V</td>
<td>025250</td>
</tr>
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</table>

9. Accessories
N 86 K..18
- Description: Order-No.: Silencer 000345 Filters 000346 Hose connector PVDF 014052

N 811 KN.18
- Description: Order-No.: Silencer 000345 Filters 000346 Hose connector PVDF 014052

N 811 KT.18
- Description: Order-No.:
### Table 1: Electrical Data

<table>
<thead>
<tr>
<th>Model</th>
<th>Electrical Type</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Power consumption</th>
<th>Operating current</th>
<th>Fuse*</th>
<th>(2 x) T (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N 86 K_.18</td>
<td></td>
<td>230 V</td>
<td>50 Hz</td>
<td>65 W</td>
<td>0.63 A</td>
<td>1.0</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 V</td>
<td>50/60 Hz</td>
<td>70 W</td>
<td>1.8 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>115 V</td>
<td>60 Hz</td>
<td>60 W</td>
<td>1.2 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Order-No. see section 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>N 811 K_.18</td>
<td></td>
<td>230 V</td>
<td>50 Hz</td>
<td>65 W</td>
<td>0.8 A</td>
<td>1.0</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 V</td>
<td>50/60 Hz</td>
<td>70 W</td>
<td>1.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td>60 Hz</td>
<td>75 W</td>
<td>1.3 A</td>
<td></td>
<td></td>
</tr>
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<td>100 W</td>
<td>0.6 A</td>
<td>1.0</td>
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<td>50/60 Hz</td>
<td>100 W</td>
<td>1.2 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>115 V</td>
<td>60 Hz</td>
<td>100 W</td>
<td>0.9 A</td>
<td></td>
<td></td>
</tr>
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<td>*Order-No. see section 8</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>N 838 K_.18</td>
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<td>230 V</td>
<td>50 Hz</td>
<td>80 W</td>
<td>0.5 A</td>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 V</td>
<td>50/60 Hz</td>
<td>80 W</td>
<td>1.2 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>115 V</td>
<td>60 Hz</td>
<td>80 W</td>
<td>0.8 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>220 V</td>
<td>60 Hz</td>
<td>80 W</td>
<td>0.45 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Order-No. see section 8</td>
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</tr>
</tbody>
</table>

### Table 2: Pneumatic Data

<table>
<thead>
<tr>
<th>Pump type</th>
<th>Delivery (l/min*)</th>
<th>Ultimate vacuum (mbar abs)</th>
<th>Maximum permissible operating pressure (bar g)</th>
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</thead>
<tbody>
<tr>
<td>N 86 KN.18</td>
<td>6</td>
<td>100</td>
<td>2.4</td>
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<tr>
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<td>5.5</td>
<td>150</td>
<td>2.5</td>
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<td>N 811 KN.18</td>
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<td>240</td>
<td>2</td>
</tr>
<tr>
<td>N 811 KT.18</td>
<td>11.5</td>
<td>290</td>
<td>2</td>
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<tr>
<td>N 816.1.2 KN.18</td>
<td>30</td>
<td>100</td>
<td>0.5</td>
</tr>
<tr>
<td>N 816.1.2 KT.18</td>
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<td>0.5</td>
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<tr>
<td>N 816.3 KN.18</td>
<td>16</td>
<td>15</td>
<td>0.5</td>
</tr>
<tr>
<td>N 816.3 KT.18</td>
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<td>0.5</td>
</tr>
<tr>
<td>N 838.1.2 KN.18</td>
<td>37</td>
<td>100</td>
<td>0.5</td>
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<tr>
<td>N 838.1.2 KT.18</td>
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<td>150</td>
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</tr>
<tr>
<td>N 838.3 KN.18</td>
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<td>12</td>
<td>0.5</td>
</tr>
<tr>
<td>N 838.3 KT.18</td>
<td>22</td>
<td>15</td>
<td>0.5</td>
</tr>
<tr>
<td>* Litre at STP at atm. pressure</td>
<td></td>
<td></td>
<td></td>
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</table>
Table 3: Pump Materials

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>Material</th>
<th>Structured Valves</th>
<th>Pumps</th>
<th>Material</th>
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<tbody>
<tr>
<td>N 86 3.2 KN.18</td>
<td>PPS EPDM</td>
<td>EPDM</td>
<td>FPM</td>
<td>EPDM</td>
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<tr>
<td>N 86 3.2 KT.18</td>
<td>PPS EPDM</td>
<td>EPDM</td>
<td>FPM</td>
<td>EPDM</td>
</tr>
<tr>
<td>N 86 3.2 KN.45.18</td>
<td>PPS EPDM</td>
<td>EPDM</td>
<td>FPM</td>
<td>EPDM</td>
</tr>
<tr>
<td>N 86 3.2 KT.45.18</td>
<td>PPS EPDM</td>
<td>EPDM</td>
<td>FPM</td>
<td>EPDM</td>
</tr>
</tbody>
</table>

Material abbreviations according to DIN ISO 1629 and 1043.1

Appendix:
Customer statement for repair order (sample statement for copying)

- In order for KNF to repair the pump, the customer must provide a statement on the media which were pumped and on pump cleaning. Please fill out the corresponding KNF form, and submit it together with the pump.

Statement/Certificate

We confirm that the pump model listed below (please specify)

[Blank lines for media list]

Serial-No. (please specify)

[Blank lines for serial number list]

was used to pump the following media:

[Blank lines for media list]

and that the pump listed above was cleaned. There are no poisonous, aggressive, biological, radioactive or other media in the pump.

Company Date/Signature

KNF Neuberger GmbH,
Alter Weg 3,
D-79112 Freiburg

Telephone ++49/7664/5909-0
Telefax ++49/7664/5909-99
E-mail: info@knf.de
www.knf.de