1. Maintenance

1.1 General
Please follow the maintenance instructions.

1.2 Installation
Before installing the filter into the system, check that the operating pressure of the system does not exceed the permitted operating pressure of the filter. Refer to the type code label on the filter.

Important:
When using filters without bypass valve and at operating pressures above 290 psi (20 bar), high differential pressure-resistant filter elements of the type B\text{H}4HC should be used for safety reasons.

1.3 Commissioning
Check that the correct filter element is installed. Screw in bowl again fully and then unscrew by one quarter-turn (the sealing effect will not be improved by overtightening).

Switch on the hydraulic system and check filter for leakage.

Vent filter at an appropriate point in the system.

Under extreme conditions (e.g. cold start), bypass valves will allow a partial flow past the element for a short time.

1.4 Maintenance Tools

<table>
<thead>
<tr>
<th>Size</th>
<th>Wrench for filter bowl</th>
<th>Allen key for oil drain plug</th>
<th>Wrench for VD 0 A.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-100</td>
<td>Hex 27</td>
<td>Hex 10</td>
<td>Hex 27</td>
</tr>
<tr>
<td>160-400</td>
<td>Hex 36</td>
<td>Hex 10</td>
<td>Hex 27</td>
</tr>
</tbody>
</table>

1.5 Torque Values

<table>
<thead>
<tr>
<th>Type LFN/LFNF</th>
<th>Torque Nm [ft-lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM/VD</td>
<td>33 [24]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type DFN/DFNF</th>
<th>Torque Nm [ft-lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM</td>
<td>33 [24]</td>
</tr>
<tr>
<td>VD</td>
<td>100 [74] standard</td>
</tr>
<tr>
<td>Oil Drain Plug</td>
<td>80 [59] – G%%</td>
</tr>
<tr>
<td>Bowl/Lid or end cover</td>
<td>Do not Torque</td>
</tr>
</tbody>
</table>

2. Element Replacement

2.1 Element Removal
1. Switch off hydraulic system and release filter pressure.
2. Remove oil drain plug (if present).
3. Unscrew filter bowl.
4. Remove filter element from element nozzle in filter head (check surface of element for contamination residue and larger particles; these can indicate damage to components).
5. Replace or clean filter element - only \text{W}HC (wire screen) and \text{V} (metal fiber) elements can be cleaned.
6. Clean filter bowl and filter head; particular attention must be given to the threads.
7. Examine filter, especially sealing surfaces, for mechanical damage.
8. Check O-rings – and replace if necessary

2.2 Element Installation
1. Switch off hydraulic system and release filter head and bowl, as well as the O-ring on the bowl and element, with clean operating fluid.
2. When installing a new filter element, check that the designation corresponds to that of the old element.
3. Place filter element carefully on to the element nozzle.
4. Apply silver grade anti-seize (per Mil-PRF-907E) to threads. Screw in filter bowl fully (metal to metal contact).
5. Screw in oil drain plug (if present).
6. Unscrew filter bowl by one quarter-turn.
7. Switch on hydraulic system and vent filter at a suitable point in the system.
8. Check filter for leakage.
### FILTER MAINTENANCE

#### 3. Spare Parts

##### 3.1 DFN, DFNF, LFN, LFNF 40 – 100, DFN 160 – 400

<table>
<thead>
<tr>
<th>Item</th>
<th>Consists</th>
<th>Designation</th>
<th>40</th>
<th>63</th>
<th>100</th>
<th>160</th>
<th>250</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Filter element</td>
<td>See Point 4. Replacement elements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Filter element</td>
<td>0040 DN...</td>
<td>0063 DN...</td>
<td>0100 DN...</td>
<td>0160 DN...</td>
<td>0250 DN...</td>
<td>0400 DN...</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>O-ring</td>
<td>21.82 x 3.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40.87 x 3.53</td>
</tr>
<tr>
<td>2.</td>
<td>Clogging indicator or indicator plug</td>
<td>See Point 5. Replacement clogging indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Indicator plug</td>
<td></td>
<td></td>
<td></td>
<td>00305932</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Profile seal ring</td>
<td>VM.../VD...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>O-ring</td>
<td>15 x 1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Repair kit LFN(F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>O-ring (element)</td>
<td>21.82 x 3.53</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40.87 x 3.53</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>O-ring (bowl)</td>
<td>59 x 3</td>
<td></td>
<td></td>
<td></td>
<td>107.54 x 3.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Back-up ring (bowl)</td>
<td>DF 60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DFN 160</td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>Profile seal ring (indicator)</td>
<td>VM.../VD...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>O-ring (indicator)</td>
<td>15 x 1.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6*</td>
<td>Oil drain plug</td>
<td>G 1/2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7*</td>
<td>Vent screw</td>
<td>G 1/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Only for DFN(F) filters

- O-Ring durometer can range from 70-80Sh. EPR Seal Kits available on request.
- Bowl assembly kits on request – kits include complete bowl with seals, plug, and threaded pin. (if present)

Other spare parts & spare parts for other versions (e.g. LFN 1.0) on request.
4. Replacement Element Model Code

<table>
<thead>
<tr>
<th>Size</th>
<th>0040, 0063, 0100, 0160, 0250, 0400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filtration Rating (micron)</td>
<td>3, 6, 10, 25 = BN4HC, BH4HC</td>
</tr>
<tr>
<td></td>
<td>25, 50, 100, 200 = W/HC</td>
</tr>
<tr>
<td>Element Media</td>
<td>BN4HC, BH4HC, W/HC</td>
</tr>
</tbody>
</table>

Seals: (omit) = Nitrile rubber (NBR) (standard)
V = Fluorocarbon elastomer (FKM)
EP = Ethylene propylene rubber (EPR)

Supplementary Details:
SO263 = Modification of elements for Skydrol or HYJET phosphate ester fluids
W = Modification of “V” elements for use with oil water emulsions (HFA) and water polymer solutions (HFC) usually polyglycol
SFREE = Element specially designed to minimize electrostatic charge generation

5. Clogging Indicator Model Code

<table>
<thead>
<tr>
<th>Indicator Prefix</th>
<th>VM = G 1/2 3000 psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip Pressure</td>
<td>VD = G 1/2 6000 psi</td>
</tr>
<tr>
<td>Type of Indicator</td>
<td>2 = 29 psid (2 bar) (option)</td>
</tr>
<tr>
<td></td>
<td>5 = 72 psid (5 bar) (standard)</td>
</tr>
<tr>
<td>Optional Supplemental</td>
<td>15 psid (1 bar) &amp; 116 psid (8 bar) available upon request</td>
</tr>
</tbody>
</table>

Light Voltage (D type indicators only):
L24 = 24V L110 = 110V

Thermal Lockout (VM, VD types C, D, J, and J4 only):
T100 = Lockout below 100°F

Underwriters Recognition (VM, VD types C, D, J, and J4 only):
cRUus = Electrical indicators with underwriter’s recognition
W = “VD…” indicator modified with a brass piston for use with high water based emulsions/solutions (HFA) & (HFC)

(For additional details and options, see Section G - Clogging Indicators of the HYDAC Filter catalog.)
6.1 User Instructions for Filters

This symbol is followed by user tips and particularly useful information.

- This pressure equipment must only be put into operation in conjunction with a machine or system.
- The pressure equipment must only be used as stipulated in the operating instructions of the machine or system.
- This pressure equipment must only be operated using hydraulic or lubricating fluid.
- It is the responsibility of the operator to comply with the water regulations of the country concerned.

This symbol denotes safety precautions, the non-observance of which can endanger persons and the environment.

CAUTION
- The user must take appropriate action (e.g. venting) to prevent the formation of air pockets.
- Repairs, maintenance work and commissioning must only be carried out by trained personnel.
- Allow the pressure equipment to cool before handling.
- The stipulations of the operating instructions of the machine or the system must be followed.
- Statutory accident prevention regulations, safety regulations and safety data sheets for fluids must be observed.
- Filter housing must be grounded.
- When working on, or in the vicinity of, hydraulic systems, open flames, sparks and smoking are forbidden.
- Hydraulic oils and water-polluting fluids must not be allowed to enter the soil or watercourses or sewer systems. Please ensure safe and environmentally friendly disposal of hydraulic oils. The relevant regulations in the country concerned with regard to ground water pollution, used oil and waste must be complied with.
- Whenever work is carried out on the filter, be prepared for hot oil to escape which can cause injury or scalding as a result of its high pressure or temperature.

DANGER!
- Comply with all regulations with regard to the disposal of used oil and waste.
- Wear proper protective clothing and guards to avoid injury or scalding due to high pressure or high temperature oil.
- Filter housing must be grounded.
- Disconnect all electrical power to the system and other electrical components, prior to working on filter clogging indicators.
- When using electrical clogging indicators, the electrical power supply to the system must be switched off before removing the clogging indicator connector.

6.2 Maintenance, General

This section describes maintenance work which must be carried out periodically. The operational safety and life expectancy of the filter, and whether it is ready for use, depend to a large extent on regular and careful maintenance.

6.3 Maintenance Measures
- Spare parts must fulfil the technical requirements specified by the manufacturer.
- Keep tools, working area and equipment clean.
- After disassembling the filter, clean all parts, check for damage or wear and replace parts if necessary.
- When changing a filter element, a high level of cleanliness must be observed.

6.4 Interval Between Element Changes

In principle we recommend that the filter element is changed every 6 months or upon indication, whichever occurs first.

We recommend installing the filter with a clogging indicator (visual and/or electrical or electronic) to monitor the filter element.

If the clogging indicator responds, it is necessary to change or clean the filter element without delay (only W and V elements can be cleaned).

When no clogging indicator has been installed, we recommend changing the elements at specific intervals. (The frequency of changing the filter elements depends on the filter design and the conditions under which the filter is operated). When filter elements are subject to high dynamic loading it may prove necessary to change them more frequently. The same applies when the hydraulic system is commissioned, repaired or when the oil is changed.

The standard clogging indicators only respond when fluid is flowing through the filter. With electrical indicators the signal can also be converted into a continuous display on the control panel. In this case the continuous display must be switched off during a cold start or after changing the element.

If the clogging indicator responds during a cold start only, it is possible that the element does not yet need to be changed.

Customer Information in respect of Machinery Directive 2006/42/EC

Hydraulic filters are defined as fluid power parts / components and are therefore excluded from the scope of the Machinery Directive, sections 1.4.1 - 1.4.3. They do not bear the CE mark.

Before using these components, ensure compliance with the specifications provided by HYDAC Technology Corporation. The specifications also contain information on the relevant essential health and safety requirements (based on Machinery Directive 2006/42/EC).

We hereby declare that the filters are intended to be incorporated into machinery within the terms of the Directive 2006/42/EC. It is prohibited to put the filters into service until the machinery as a whole is in conformity with the provisions of the Machinery Directive.

NOTE
The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.
North America Locations

USA

North America Headquarters
HYDAC TECHNOLOGY CORPORATION
2280 City Line Road
Bethlehem, PA 18017
+1.610.266.0100

HYDAC TECHNOLOGY CORPORATION
Filter Division
1051 Airlie Parkway
Denver, NC 28037
+1.610.266.0100

HYDAC TECHNOLOGY CORPORATION
Filter System Division
Sales Office & Operations
510 Stonegate Drive
Katy, TX 77494
+1.281.579.8100

HYDAC TECHNOLOGY CORPORATION
Cooling System Division
SE Sales Office
1051 Airlie Parkway
Denver, NC 28037
+1.610.266.0100

HYDAC TECHNOLOGY CORPORATION
Process Filter Division
Sales Office & Operations
510 Stonegate Drive
Katy, TX 77494
+1.281.579.8100

HYDAC TECHNOLOGY CORPORATION
Fuel Filtration Division
SE Sales Office
1051 Airlie Parkway
Denver, NC 28037
+1.610.266.0100

HYDAC TECHNOLOGY CORPORATION
Hydraulic Division – Compact Hydraulics
1660 Enterprise Parkway • Suite E
Wooster, OH 44691
+1.610.266.0100

HYDAC TECHNOLOGY CORPORATION
Hydraulic Division – Tech Center
1660 Enterprise Parkway • Suite E
Wooster, OH 44691
+1.610.266.0100

Canada

HYDAC CORPORATION
14 Federal Road
Welland, Ontario, Canada L3B 3P2
+1.905.714.9322

HYDAC CORPORATION
Sales Office
5160 75 Street NW
Edmonton, Alberta, Canada T6E 6W2
+1.780.484.4228

Mexico

HYDAC INTERNACIONAL SA de CV
Calle Alfredo A Nobel No 35
Col Puente de Viga
Tlalnepantla, Edl Mexico
CP 54090
Mexico
+011.52.55.4777.1262