Many aspects of industrial processing involve the transfer of heat energy (absorbed or released) during product reaction. Importantly, the temperature difference is a vital aspect of the process for high levels of efficiency to be possible. For this reason, specific thermal liquids are employed in order to allow the thermal gradient to be closely controlled and maintained throughout the process.

1 **Circulation pumps (primary circuit):** In the primary circuit, the thermal media is heated by a burner and pumped around the closed-loop pipe-work by a circulating pump. The choice of pump depends on the temperature profile and thermal medium being used. Thermal oil (hydro-carbon) pumps have a nominal pressure rating of 16 bar and designed to an industrial grade standard. Where water is used as the heat-transfer medium, then the nominal pressure of the hot water pumps is much higher and often rated to 40 bar.

2 **Circulation pumps (secondary circuit):** Most heat transfer systems operate with a primary and a secondary circuit. The primary circuit is heated by the burner and supplies the heat to the smaller secondary circuit. The secondary circuit, as an example, is a closed loop around a process reactor, vessel, or oven. Circulation of the heat-transfer medium, in the secondary circuit, is done by the secondary recirculation pumps. These are normally smaller than those on the primary circuit, but have a similar technical requirement.
Up to 200 °C, water is often the preferred heat-transfer medium because of its non-polluting and high specific heat characteristics. Up to circa. 400 °C, organic heat-transfer liquids are preferable due to their relatively low vapour pressure when compared with hot water. Specifically for these applications, a family of end-suction centrifugal pumps have been developed to cope with the thermal demands. Importantly, the design of a hot water pump differs considerably to that of its hot-oil cousin. This is because of the differing thermal properties and fluid characteristics of oil and water at the elevated temperatures.

### Circulation pumps

<table>
<thead>
<tr>
<th>Pumps</th>
<th>Pump types</th>
<th>Pump execution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot water pumps</td>
<td>Type ZEN, ZDN, ZHN</td>
<td>Capacity: Max. 600 m³/h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shaft sealing:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mechanical seal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material: Ductile iron</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure: Max. 40 bar</td>
</tr>
<tr>
<td>Hot oil pumps</td>
<td>Type CBE, ZTK, ZTN</td>
<td>Capacity: Max. 1000 m³/h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shaft sealing:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mechanical seal, magnetic drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material: Ductile iron, stainless steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure: Max. 16 bar</td>
</tr>
</tbody>
</table>

### Circulation pumps

<table>
<thead>
<tr>
<th>Pumps</th>
<th>Pump types</th>
<th>Pump execution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot water pumps</td>
<td>Type ZEN, ZDN, ZHN</td>
<td>Capacity: Max. 600 m³/h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shaft sealing:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mechanical seal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material: Ductile iron</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure: Max. 40 bar</td>
</tr>
<tr>
<td>Hot oil pumps</td>
<td>Type CBE, ZTK, ZTN</td>
<td>Capacity: Max. 1000 m³/h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shaft sealing:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mechanical seal, magnetic drive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Material: Ductile iron, stainless steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure: Max. 16 bar</td>
</tr>
</tbody>
</table>

**SIHiDetect - Condition Based Monitoring**

Detect wear before damage occurs
+ Cavitation and process turbulence
+ Simple to connect
+ LED display
+ Available Ex
+ All rotating machinery
+ DCS integration and continual monitoring

Noise and Vibration analysis allows this compact device to diagnose the (often hidden) symptoms of longer term damage even before vibration occurs.
**EUROPE**
Sterling Fluid Systems (Austria)  
Wien  
Tel. +43 (0) 1 680 050  
sales_austria@sterlingsihi.de

Sterling Fluid Systems (Belgium)  
Groot-Bijgaarden  
Tel. +32 (0) 2 81 7711  
sales_be@sterlingfluid.com

Sterling SIHI (Bulgaria)  
Sofia-Iliinden  
Tel. +359 (0) 2 82 8311  
ioffice@sterlingsihi.bg

Sterling Fluid Systems  
(Gzech Rep.) Ostrava  
Tel. +420 587 433 651  
sterling@sterling.cz

Sterling Fluid Systems (France)  
Trappes  
Tel. +33 (0) 1 34 823 900  
sales.france@sterlingfluid.com

Sterling SIHI (Germany)  
Itzehoe  
Tel. +49 (0) 4821 771 04  
sales@sterlingsihi.de

Sterling Fluid Systems (Hungary)  
Veszprem  
Tel. +36 (0) 88 406 633  
info@sterlingsihi.hu

Sterling Fluid Systems (Italy)  
Monza, Milan  
Tel. +39 039 282 41  
sterlingitaly@sidro.it

Sterling Fluid Systems (Netherlands)  
Beverwijk  
Tel. +31 (0) 251 263 232  
info@sihi.nl

Sterling Fluid Systems (Poland)  
Warszawa  
Tel. +48 (0) 22 335 2480/81  
sterling@sterling.pl

Sterling Fluid Systems (Romania)  
Bucuresti  
Tel. +40 (0) 21 610 7188  
office@sterlingsihi.ro

Sterling Fluid Systems (Spain)  
Madrid  
Tel. +34 91 709 1310  
sihi@sihi.es

Sterling Fluid Systems (Schweiz)  
Schaffhausen  
Tel. +41 (0) 52 644 06 06  
info@sterling.ch

Sterling Fluid Systems (UK)  
Altrincham, Cheshire  
Tel. +44 (0) 161 928 6371  
uksales@sterlingliquid.com

**AMERICAS**
Sterling Fluid Systems (Spain)  
SIHI Pumps Limited (Canada)  
Guelph Ontario  
Tel. +1 519 824 4600  
mail@sihi.com

SIHI Pumps Inc. (USA)  
Grand Island, New York  
Tel. +1 716 773 6450  
mail@sihi.com

SIHI Ltda. (Chile)  
Quilicura, Santiago  
Tel. +56 2 756 5900  
ventas@sihi.cl

SIHI do Brazil (Brazil)  
Campinas  
Tel. +55 19 3773 6057  
info@sihi.com.br

SIHI Pumps (Colombia)  
Bogota  
Tel. +57 1 364 92 64  
info@sihi.com.co

SIHI (Peru) Lima  
Tel. +51 1 421 7411  
ventas@sihiperu.com.pe

**ASIA**
SIHI Pumps (Singapore)  
International Business Park  
Tel. +65 65 62 83 00  
info.singapore@sihipumpsasia.com

SIHI Pumps SDN BHD (Malaysia)  
Selangor Darul Ehsan  
Tel. +60 3 8942 6877  
info.malaysia@sihipumpsasia.com

SIHI Pumps (China)  
Shanghai  
Tel. +86 21 621 88068  
info.china@sihipumpsasia.com

SIHI Pumps Ltd (Thailand)  
Bangkok  
Tel. +66 2 319 2567  
info.thailand@sihipumpsasia.com

For further address details please visit:  
www.sterlingSIHI.com

---

**Pumping Technology For A Better Future**