Hydraulic Pumps
Mobile & Industrial T6*R
Denison Vane Technology, fixed displacement
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Features

GREATER FLOW
Greater flow for the envelope size is achieved by increased displacement cam rings: at high permissible speeds with atmospheric inlet.
C → 3 to 31 GPM, 10 to 100 ml/rev.
D → 14 to 50 GPM, 48 to 158 ml/rev.
E → 42 to 72 GPM, 132 to 227 ml/rev.

HIGHER PRESSURE
Pressure ratings up to 275 bar, which allows to reduce the size and cost of the actuators, valves and lines.

BETTER EFFICIENCY
Better efficiency under load which increases the productivity and reduces the heating and operating costs.

MOUNTING FLEXIBILITY
Single pumps: 4 positions + 4 on rear drive.
Triple pumps: 128 positions + 2 on rear drive.

REAR DRIVE
Mounting pads and couplings are fully conformable to SAE J744c and ISO 3019-1.
SAE A / B / BB / C couplings
Triple pumps SAE A adaptor and coupling.

LOWER NOISE LEVELS
Increase the operator’s safety and acceptance.

COMPLETE CONFORMITY
To SAE - J744c 2-bolt standards and to ISO 3019-1 in the various keyed and splined shaft options offered.

CARTRIDGE DESIGN
Provides for drop-in assemblies. This design permits an easy conversion or renewal of serviceable elements in minutes at minimum expense and risk of contamination. Pump rotation is easy to change by changing the position of the cam ring on the port plate dowel pin hole.

WIDER RANGE OF ACCEPTABLE VISCOSITIES
Viscosities from 860 to 10 cSt, (2000 to 10 cSt for Mobile), permit colder starts and hotter running. The balanced design compensates for wear and temperature changes. At high viscosity or cold temperature, the rotor to side plates gap is well lubricated and improves the mechanical efficiency.

FIRE RESISTANT FLUIDS
Including phosphate esters, chlorinated hydrocarbons, water glycols and invert emulsions. They may be pumped at higher pressures and with longer service life by these pumps.

GENERAL APPLICATIONS INSTRUCTIONS
1. Check the speed range, pressure, temperature, fluid quality, viscosity and pump rotation.
2. Check the inlet conditions of the pump, if it can accept application requirement.
3. Type of shaft: check if it can support the system’s operating torque.
4. Coupling must be chosen to minimize the pump shaft load (weight, misalignment).
5. Filtration: must be adequate for lowest contamination level.
6. Environment of pump: to avoid the noise reflection, pollution and shocks.
## Min & max speeds, pressure ratings
### Series T6*R, Denison Vane Pumps

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Theoretical Displacement (ml/rev)</th>
<th>Minimum Speed</th>
<th>Maximum Speed</th>
<th>Maximum Pressure</th>
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CR CRM: * = 0 : Industrial version
        * = B : Mobile version

HF-0, HF2 = Antiwear Petroleum Base
HF-1 = Non Antiwear Petroleum Base
HF-5 = Synthetic Fluids
HF-3 = Water in oil Emulsions
HF-4 = Water Glycols

*For further information or if the performance characteristics outlined above do not meet your own particular requirements, please consult your local Parker office.*
### Min allowable inlet pressure

**Series T6*R, Denison Vane Pumps**

<table>
<thead>
<tr>
<th>Cartridge</th>
<th>Speed RPM</th>
<th>Displacement</th>
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<tr>
<td></td>
<td>1200</td>
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</table>

Inlet pressure is measured at inlet flange with petroleum base fluids at a viscosity between 10 and 65 cSt. The difference between inlet pressure at the pump flange and atmospheric pressure must not exceed 0.2 bar to prevent aeration.

Multiply absolute pressure by 1.25 for HF-3, HF-4 fluids.

by 1.35 for HF-5 fluid.

by 1.10 for ester or rapeseed base.

Use highest cartridge absolute pressure for triple pumps.

### GENERAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Mounting standard</th>
<th>Weight without connectors and bracket - kg</th>
<th>Moment of inertia km² x 10⁻⁴</th>
<th>SAE 4 bolts J518c - ISO/DIS 6162-1</th>
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</thead>
<tbody>
<tr>
<td>T6CR/ T6CRM</td>
<td>SAE J744c ISO/3019-1 SAE B</td>
<td>17,0</td>
<td>7,6</td>
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<tr>
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<td></td>
<td></td>
<td>1.1/2&quot;</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1&quot;</td>
</tr>
<tr>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2&quot;</td>
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<td></td>
<td>1.1/2&quot;</td>
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<td>1.1/4&quot;</td>
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<td>1&quot; or 3/4&quot;</td>
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</tbody>
</table>
**CALCULATION**

To resolve

<table>
<thead>
<tr>
<th>Volumetric displacement</th>
<th>Vi [ml/rev.]</th>
<th>Available flow</th>
<th>Q [l/min]</th>
<th>Input Power</th>
<th>p [Kw]</th>
<th>Performances required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td>Requested flow Q [l/min] 60</td>
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</tbody>
</table>

Routine:

1. First calculation \(Vi = \frac{1000 \times Q}{n}\)

2. Choose \(Vi\) of pump immediately greater (see tabulation)

3. Theoretical flow of this pump

\[Q_{\text{theo.}} = \frac{Vi \times n}{1000}\]

\[Q_{\text{theo.}} = \frac{46 \times 1500}{1000} = 69 \text{ l/min}\]

4. Find \(Q_{\text{per.}}\) leakage function of pressure \(Q_{\text{per.}} = f(p)\) on curve at 10 or 24 cSt

\[Q_{\text{eff.}} = Q_{\text{theo.}} - Q_{\text{per.}}\]

5. Available flow \(Q_{\text{eff.}} = Q_{\text{theo.}} - Q_{\text{per.}}\)

6. Theoretical input power curve

\[P_{\text{theo.}} = \frac{Q_{\text{theo.}} \times p}{600}\]

\[P_{\text{theo.}} = \frac{69 \times 150}{600} = 17,3 \text{ kW}\]

7. Find \(Ps\) hydrodynamic power loss on curve

\[T6CR (page 10) : Ps\text{ at }1500 \text{ R.P.M., } 150 \text{ bar } = 1,5 \text{ kW}\]

8. Calculation of necessary input power

\[P_{\text{eff.}} = P_{\text{theo.}} + Ps\]

\[P_{\text{eff.}} = 17,3 + 1,5 = 18,8 \text{ kW}\]

9. Results

\[\begin{align*}
Vi &= 46,0 \text{ ml/rev.} \\
Q_{\text{eff.}} &= 64,0 \text{ l/min} \\
P_{\text{eff.}} &= 18,8 \text{ kW}
\end{align*}\]

\[T6CR 014\]

These calculation steps must be followed for each application.

---

**INTERMITTENT PRESSURE RATING**

T6 units may be operated intermittently at pressures higher than the recommended continuous rating when the time weighted average of pressure is less than or equal to the continuous duty pressure rating. This intermittent pressure rating calculation is only valid if other parameters: speed, fluid, viscosity and contamination level are respected. For total cycle time higher than 15 minutes, please consult your Parker representative.

Example: T6CR - 014

Duty cycle 4 min. at 275 bar
1 min. at 35 bar
5 min. at 160 bar

\[
\frac{(4 \times 275) + (1 \times 35) + (5 \times 160)}{10} = 193,5 \text{ bar}
\]

193,5 bar < 240 bar allowed as continuous pressure for T6CR - 014 with HF-0 fluid.
GENERAL

All Parker vane pumps are individually tested to provide the best quality & reliability. Modifications, conversions & repairs can only be done by authorized dealer or OEM to avoid invalidation of the guarantee.

The pumps are to be used in the design limits indicated in all the sales bulletins. Please contact Parker when tresspassing the catalogue limits.

Do not modify or work on the pump under pressure or when the electric motor (or any drive) is on.

Qualified personnel is required to assemble and set-up hydraulic devices.

Always conform yourself to the valid regulations (safety, electrical, environment...). Carefully following the below instructions will help in getting a long lasting pump.

ROTATION WAY AND PORTS INDICATION

The rotation way and ports orientation are viewed from the shaft end.

CW stands for clockwise = Right-hand rotation.

CCW stands for counter-clockwise = Left-hand rotation.

PRE-START CHECKS

Before initial starting of the pump, the following checks should be made:

a. Check the rotation of the power source to be sure the pump shaft will rotate in the direction indicated by the arrow on the pump nameplate.
b. Check inlet and discharge lines to be sure all connections are tight and properly connected.
c. Check fluid type, its cleanliness and level. Make sure it can freely reach the pump inlet.

The pressure relief valve should be backed off to its minimum setting value so the pump is unloaded when started. Circuit priming and air bleed off have to be performed before resetting the pressure relief valve. For priming, a minimum pump shaft speed of 600 rpm is recommended. To prevent possible damage to the internal parts, the pump should never be started dry or without internal lubrication.

- Pump with positive head: allow the fluid to flow to the pump inlet, loosen the discharge port(s) fitting(s) until the fluid comes out and re-tighten the discharge line(s). Then start the pump which should prime quite instantly. Purge the air off the circuit, preferably using air bleed off valves or pressure test points. Let the pump discharge several minutes unloaded.

- Pump mounted above fluid level: fill the pump through outlet port(s) with suitable and clean fluid and start rotation in jog mode. Purge the air off the circuit, preferably using air bleed off valves or pressure test points. Let the pump discharge several minutes unloaded.

NOTE

If the pump does not prime properly or pressure cannot be obtained within seconds, it should be shut down and conditions corrected. Refer to the machine/vehicle manufacturer instructions and pump catalogue.

MAINTENANCE

The pump is self-lubricating and its preventive maintenance is limited to keeping the hydraulic fluid clean and maintaining its viscosity within the acceptable limits. Keep all fittings and screws tight. Do not operate at pressures or speeds in excess of the recommended limits. If the pump does not operate properly, check with the troubleshooting chart before attempting to overhaul the unit. The pump is fully serviceable.
Hydraulic Pumps, Fixed  
Series T6*R, Denison Industrial Vane Pumps

**Description**

Shaft end outlet port has 4-positions at 90° intervals relative to inlet. Front sideplate is clamped axially by discharge pressure to reduce internal leakage.

Pilot recess as required by SAE for full conformity.

Shaft comes in variety of keyed and splined options to meet SAE and ISO 3019-1.

Ball bearing holds shaft in alignment.

Cartridge is a replaceable assembly including cam ring, rotor, vanes, pins and sideplate.

**APPLICATION ADVANTAGES**

- High pressure capability up to 275 bar, in a small envelope, reduces the installation costs.
- High mechanical efficiency, typically 94%. Reduced heat generation.
- Wide speed range. Large size cartridge displacements. Lowest noise level.
- Low ripple pressure reduces the piping noise and increases the life time of other components in the circuit.
- High resistance to particle contamination and increased pump life thanks to the double lip vanes.
- Many of options (cam displacement, shaft, porting) for customized installation.
PARKER HANNIFIN MANUFACTURING FRANCE SAS
VIERZON - FRANCE

HYDRAULIC PUMPS, FIXED
SERIES T6*R, DENISON INDUSTRIAL VANE PUMPS

RECOMMENDED FLUIDS
Petroleum based antiwear R & O fluids.
These fluids are the recommended fluids for T6 series pumps. Maximum catalog ratings and performance data are based on operation with these fluids. These fluids are covered by Denison fluids HF-0 and HF-2 specification.

ACCEPTABLE ALTERNATE FLUIDS
The use of fluids other than petroleum based antiwear R & O fluids requires that the maximum ratings of the pumps will be reduced. In some cases the minimum replenishment pressures must be increased. Consult specific sections for more details.

VISCOSITY
Max (cold start, low speed & pressure) 860 mm²/s (cSt)
Max (full speed & pressure) 108 mm²/s (cSt)
Optimum (max. life) 30 mm²/s (cSt)
Min (full speed & pressure for HF-1, HF-3, HF-4 & HF-5 fluids) 18 mm²/s (cSt)
Min (full speed & pressure for HF-0 & HF-2 fluids) 10 mm²/s (cSt)

VISCOSITY INDEX
90° min. higher values extend range of operating temperatures.

Maximum fluid temperature (θ) °C
HF-0, HF-1, HF-2 + 100 °C
HF-3, HF-4 + 50 °C
HF-5 + 70 °C
Biodegradable fluids (esters & rapeseed base) + 65 °C

Minimum fluid temperature (θ) °C
HF-0, HF-1, HF-2, HF-5 - 18 °C
HF-3, HF-4 + 10 °C
Biodegradable fluids (esters & rapeseed base) - 20 °C

FLUID CLEANLINESS
The fluid must be cleaned before and during operation to maintain the contamination level of NAS 1638 class 8 (or ISO 19/17/14) or better. Filters with 25 micron (or better, ß10 ≥ 100) nominal ratings may be adequate but do not guarantee the required cleanliness levels. Suction strainers must be of adequate size to provide the minimum inlet pressure specified. 100 mesh (150 micron) is the finest mesh recommended. Use oversized strainers or omit them altogether on applications which require cold starts or use fire resistant fluids.

OPERATING TEMPERATURES AND VISCOSITIES
Operating temperatures are a function of fluid viscosities, fluid type, and the pump. Fluid viscosity should be selected to provide the optimum viscosity at normal operating temperatures. For cold starts, the pumps should be operated at low speed and pressure until the fluid warms up to an acceptable viscosity for full power operation.

WATER CONTAMINATION IN THE FLUID
Maximum acceptable content of water.
• 0.10% for mineral base fluids.
• 0.05% for synthetic fluids, crankcase oils, biodegradable fluids.
If amount of water is higher then it should be drained off the circuit.

COUPLINGS AND FEMALE SPLINES
• The mating female spline should be free to float and find its own center. If both members are rigidly supported, they must be aligned within 0.15 TIR or less to reduce fretting. The angular alignment of two spline axes must be less than ± 0.05 per 25.4 radius.
• The coupling spline must be lubricated with a lithium molydisulfide grease or a similar lubricant.
• The coupling must be hardened to a hardness between 27 and 45 R.C.
• The female spline must be made to conform to the Class 1 fit as described in SAE-J498b (1971). This is described as a Flat Root Side Fit.

KEYED SHAFTS
Parker supplies the T6 series keyed shaft pumps with high strength heat-treated keys. Therefore, when installing or replacing these pumps, the heat-treated keys must be used in order to insure maximum life in the application. If the key is replaced, it must be a heat-treated key between 27 and 34 R.C. hardness. The corners of the keys must be chamfered from 0.76 to 1.02 at 45° to clear the radii in the key way. The alignment of keyed shafts must be within the tolerances given for splined shafts.

SHAFT LOADS
These products are primarily designed for coaxial drives which do not impose axial or side loading on the shaft. Consult specific sections for more details.
Catalogue HY29-0027/UK

Ordering Code

Hydraulic Pumps, Fixed
Series T6CR, Denison Industrial Vane Pumps

Model No.
T6CR (Y) - 022 - 1 L 00 - A 1 0 - A 1 ....

Series
Y = Port flanges with metric threads

Cam ring
(Delivery at 0 bar & 1500 r.p.m.)
003 = 16.2 l/min 017= 87.4 l/min
005 = 25.8 l/min 020 = 95.7 l/min
006 = 31.9 l/min 022 = 105.4 l/min
008 = 39.6 l/min 025 = 118.9 l/min
010 = 51.1 l/min 028 = 133.2 l/min
012 = 55.6 l/min 031 = 150.0 l/min
014 = 69.0 l/min

Type of shaft
1 = keyed (SAE BB) 4 = splined (SAE BB)
2 = keyed (non SAE) 5 = keyed (non SAE)
3 = splined (SAE B)

Direct. of rotation (view on shaft end)
R = clockwise
L = counter-clockwise

Porting combination
00 = standard

INTERNAL LEAKAGE (TYPICAL)

NOISE LEVEL (TYPICAL) - T6CR - 022

PERMISSIBLE RADIAL LOAD

Do not operate the pump more than 5 seconds at any speed or viscosity if internal leakage is more than 50% of theoretical flow.
Hydraulic Pumps, Fixed
Series T6CR, Denison Industrial Vane Pumps

Dimensions & Operating characteristics

**Weight**: 20.4 kg

**Adaptor**

<table>
<thead>
<tr>
<th>SAE A</th>
<th>D1</th>
<th>D2</th>
<th>P</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
</tr>
</thead>
<tbody>
<tr>
<td>82.65/82.6</td>
<td>M10</td>
<td>24</td>
<td>106.4</td>
<td>11.0</td>
<td>8.0</td>
<td>32.0</td>
<td>209.0</td>
<td></td>
</tr>
<tr>
<td>101.70/101.65</td>
<td>M12</td>
<td>28</td>
<td>146.0</td>
<td>16.0</td>
<td>8.0</td>
<td>46.0</td>
<td>223.0</td>
<td></td>
</tr>
<tr>
<td>127.10/127.05</td>
<td>M16</td>
<td>181.0</td>
<td>16.0</td>
<td>8.0</td>
<td>56.0</td>
<td>233.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Shaft Torque Limits [ml/rev x bar]**

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Vi x p max.</th>
<th>Coupling drive</th>
<th>Vi x p max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21420</td>
<td>SAE A</td>
<td>11000</td>
</tr>
<tr>
<td>2</td>
<td>14300</td>
<td>SAE B</td>
<td>20600</td>
</tr>
<tr>
<td>3</td>
<td>20600</td>
<td>SAE BB</td>
<td>22050</td>
</tr>
<tr>
<td>4</td>
<td>32670</td>
<td>SAE C</td>
<td>22050</td>
</tr>
<tr>
<td>5</td>
<td>34180</td>
<td>SAE - 11 teeth</td>
<td>15850</td>
</tr>
</tbody>
</table>

**Operating Characteristics - Typical [24 cSt]**

<table>
<thead>
<tr>
<th>Series</th>
<th>Volumetric Displacement Vi</th>
<th>Flow Q [l/min] &amp; n = 1500 RPM</th>
<th>Input Power P [kW] &amp; n = 1500 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Flow Q</td>
<td>p = 0 bar</td>
</tr>
<tr>
<td>003</td>
<td>10.8 ml/rev</td>
<td>16.2</td>
<td>7.7</td>
</tr>
<tr>
<td>005</td>
<td>17.2 ml/rev</td>
<td>25.8</td>
<td>17.3</td>
</tr>
<tr>
<td>006</td>
<td>21.3 ml/rev</td>
<td>31.9</td>
<td>23.4</td>
</tr>
<tr>
<td>008</td>
<td>26.4 ml/rev</td>
<td>39.6</td>
<td>31.1</td>
</tr>
<tr>
<td>010</td>
<td>34.1 ml/rev</td>
<td>51.1</td>
<td>42.6</td>
</tr>
<tr>
<td>012</td>
<td>37.1 ml/rev</td>
<td>55.6</td>
<td>47.1</td>
</tr>
<tr>
<td>014</td>
<td>46.0 ml/rev</td>
<td>69.0</td>
<td>60.5</td>
</tr>
<tr>
<td>017</td>
<td>58.3 ml/rev</td>
<td>87.4</td>
<td>78.9</td>
</tr>
<tr>
<td>020</td>
<td>63.8 ml/rev</td>
<td>95.7</td>
<td>87.2</td>
</tr>
<tr>
<td>022</td>
<td>70.3 ml/rev</td>
<td>105.4</td>
<td>96.9</td>
</tr>
<tr>
<td>025(1)</td>
<td>79.3 ml/rev</td>
<td>118.9</td>
<td>110.4</td>
</tr>
<tr>
<td>028(1)</td>
<td>88.8 ml/rev</td>
<td>133.2</td>
<td>125.8(2)</td>
</tr>
<tr>
<td>031(1)</td>
<td>100.0 ml/rev</td>
<td>150.0</td>
<td>142.5(2)</td>
</tr>
</tbody>
</table>

1) 025 - 028 - 031 = 2500 R.P.M. max. 2) 028 - 031 = 210 bar max. int. Port connection can be furnished with metric threads.
Ordering Code

Model No. T6DR (Y) - 022 - 1 L 00 - A 1 0 - A 1 ....

Series Y = Port flanges with metric threads
(Cam ring) (Delivery at 0 bar & 1500 r.p.m.)
014 = 71,4 l/min 035 = 166,5 l/min
017 = 87,3 l/min 038 = 180,4 l/min
020 = 99,0 l/min 042 = 204,0 l/min
024 = 119,3 l/min 045 = 218,5 l/min
028 = 134,5 l/min 050 = 237,0 l/min
031 = 147,4 l/min

Type of shaft
1 = keyed (SAE CC)
2 = keyed (SAE C)
3 = splined (SAE CC)
5 = keyed (non SAE)

Direct. of rotation (view on shaft end)
R = clockwise
L = counter-clockwise

Porting combination
00 = standard

Modification
Seal class
1 = S1 (for mineral oil)
4 = S4 (for the resistant fluids)
5 = S5 (for mineral oil and fire resistant fluids)

Design letter
Porting adaptor
Coupling
1 = SAE A
2 = SAE B
3 = SAE BB
4 = SAE C
5 = SAE J498b

Adaptor
0 = None
B = SAE B
A = SAE A
C = SAE C

INTERNAL LEAKAGE (TYPICAL)

INTERNAL LEAKAGE (TYPICAL)

NOISE LEVEL (TYPICAL) - T6DR - 038

Do not operate the pump more than 5 seconds at any speed or viscosity if internal leakage is more than 50% of theoretical flow

POWER LOSS HYDROMECHANICAL (TYPICAL)

PERMISSIBLE RADIAL LOAD

Maximum permissible axial load Fa = 1200 N

Shaft keyed No.1
Hydraulic Pumps, Fixed
Series T6DR, Denison Industrial Vane Pumps

Dimensions & Operating characteristics

Adaptor

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>P</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE A</td>
<td>82,65/82,60</td>
<td>M10</td>
<td>24</td>
<td>106,4</td>
<td>11,0</td>
<td>8,0</td>
<td>32,0</td>
<td>237,0</td>
</tr>
<tr>
<td>SAE B</td>
<td>101,70/101,65</td>
<td>M12</td>
<td>28</td>
<td>146,0</td>
<td>16,0</td>
<td>8,0</td>
<td>46,0</td>
<td>251,0</td>
</tr>
<tr>
<td>SAE C</td>
<td>127,10/127,05</td>
<td>M16</td>
<td>-</td>
<td>181,0</td>
<td>16,0</td>
<td>8,0</td>
<td>56,0</td>
<td>261,0</td>
</tr>
</tbody>
</table>

Adaptor Coupling drive

<table>
<thead>
<tr>
<th>SAE A</th>
<th>SAE B</th>
<th>SAE C</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE A</td>
<td>SAE B</td>
<td>SAE C</td>
</tr>
<tr>
<td>SAE A</td>
<td>SAE B</td>
<td>SAE C</td>
</tr>
<tr>
<td>SAE A</td>
<td>SAE B</td>
<td>SAE C</td>
</tr>
</tbody>
</table>

Shaft torque limits [ml/rev x bar]

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Coupling drive</th>
<th>Vi x p max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SAE A</td>
<td>43240</td>
</tr>
<tr>
<td>2</td>
<td>SAE B</td>
<td>66036</td>
</tr>
<tr>
<td>3</td>
<td>SAE BB</td>
<td>61200</td>
</tr>
<tr>
<td>4</td>
<td>SAE C</td>
<td>55600</td>
</tr>
<tr>
<td>5</td>
<td>SAE C</td>
<td>37390</td>
</tr>
</tbody>
</table>

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

<table>
<thead>
<tr>
<th>Series</th>
<th>Volumetric Displacement Vi</th>
<th>Flow Q [l/min] &amp; n = 1500 RPM</th>
<th>Input power P [kW] &amp; n = 1500 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>p = 0 bar</td>
<td>p = 140 bar</td>
</tr>
<tr>
<td>014</td>
<td>47,6 ml/rev</td>
<td>71,4</td>
<td>62,1</td>
</tr>
<tr>
<td>017</td>
<td>58,2 ml/rev</td>
<td>87,3</td>
<td>78,0</td>
</tr>
<tr>
<td>020</td>
<td>66,0 ml/rev</td>
<td>99,0</td>
<td>89,7</td>
</tr>
<tr>
<td>024</td>
<td>79,5 ml/rev</td>
<td>119,3</td>
<td>110,0</td>
</tr>
<tr>
<td>028</td>
<td>89,7 ml/rev</td>
<td>134,5</td>
<td>125,2</td>
</tr>
<tr>
<td>031</td>
<td>98,3 ml/rev</td>
<td>147,4</td>
<td>138,1</td>
</tr>
<tr>
<td>035</td>
<td>111,0 ml/rev</td>
<td>166,5</td>
<td>157,2</td>
</tr>
<tr>
<td>038</td>
<td>120,3 ml/rev</td>
<td>180,4</td>
<td>171,1</td>
</tr>
<tr>
<td>042(1)</td>
<td>136,0 ml/rev</td>
<td>204,0</td>
<td>194,7</td>
</tr>
<tr>
<td>045(2)</td>
<td>145,7 ml/rev</td>
<td>218,5</td>
<td>209,2</td>
</tr>
<tr>
<td>050(3)</td>
<td>158,0 ml/rev</td>
<td>237,0</td>
<td>227,7</td>
</tr>
</tbody>
</table>

1) 042 - 045 - 050 = 2200 R.P.M. max.  2) 050 = 210 bar max. int.  Port connection can be furnished with metric threads.
**Ordering Code**

*Hydraulic Pumps, Fixed*

*Series T6ER, Denison Industrial Vane Pumps*

**Model No.**

T6ER (Y) - 066 - 1 R 00 - A 1 - A 1

**Series**

Y = Port flanges with metric threads

**Cam ring**

(Delivery at 0 bar & 1500 r.p.m.)

<table>
<thead>
<tr>
<th>Series</th>
<th>042</th>
<th>045</th>
<th>050</th>
<th>052</th>
</tr>
</thead>
<tbody>
<tr>
<td>l/min</td>
<td>198.5</td>
<td>213.6</td>
<td>237.7</td>
<td>247.2</td>
</tr>
</tbody>
</table>

**Type of shaft**

1 = keyed (SAE CC)

3 = splined (SAE C)

4 = splined (SAE CC)

**Direct. of rotation (view on shaft end)**

R = clockwise

L = counter-clockwise

**Porting combination**

00 = standard

**Modification**

**Seal class**

1 = S1 (for mineral oil)

4 = S4 (for the resistant fluids)

5 = S5 (for mineral oil and fire resistant fluids)

**Design letter**

**Porting adaptor**

**Seal class**

1 = S1 (for mineral oil)

4 = S4 (for the resistant fluids)

5 = S5 (for mineral oil and fire resistant fluids)

**Type of shaft**

1 = keyed (SAE CC)

3 = splined (SAE C)

4 = splined (SAE CC)

**Direct. of rotation (view on shaft end)**

R = clockwise

L = counter-clockwise

**Porting combination**

00 = standard

**INTERNAL LEAKAGE (TYPICAL)**

Pressure p [bar]

Do not operate the pump more than 5 seconds at any speed or viscosity if internal leakage is more than 50% of theoretical flow

**NOISE LEVEL (TYPICAL) - T6ER - 050**

Pe = 0.9 bar abs

n = 1000 RPM

n = 1500 RPM

ν = 32 cSt

Lw = Lp + 8 dB (A)

**PERMISSIBLE RADIAL LOAD**

Maximum permissible axial load Fa = 2000 N
Hydraulic Pumps, Fixed
Series T6ER, Denison Industrial Vane Pumps

Dimensions & Operating characteristics

**Adaptor**

<table>
<thead>
<tr>
<th>Adaptor</th>
<th>D1</th>
<th>D2</th>
<th>P</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE A</td>
<td>82,65</td>
<td>82,60</td>
<td>24</td>
<td>106,4</td>
<td>11,0</td>
<td>8,0</td>
<td>32,0</td>
<td>272,0</td>
</tr>
<tr>
<td>SAE B</td>
<td>101,70</td>
<td>101,65</td>
<td>28</td>
<td>146,0</td>
<td>16,0</td>
<td>8,0</td>
<td>46,0</td>
<td>286,0</td>
</tr>
<tr>
<td>SAE C</td>
<td>127,10</td>
<td>127,05</td>
<td>42</td>
<td>181,0</td>
<td>16,0</td>
<td>8,0</td>
<td>56,0</td>
<td>296,0</td>
</tr>
</tbody>
</table>

**Shaft torques limits [ml/rev x bar]**

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Vi x p max.</th>
<th>Coupling drive</th>
<th>Vi x p max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>80560</td>
<td>SAE A</td>
<td>11000</td>
</tr>
<tr>
<td>2</td>
<td>61200</td>
<td>SAE B</td>
<td>20600</td>
</tr>
<tr>
<td>4</td>
<td>120210</td>
<td>SAE BB</td>
<td>32670</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SAE C</td>
<td>66480</td>
</tr>
</tbody>
</table>

**Shaft code 1**

KEYED SAE CC

**Shaft code 2**

SAE C SPLINED SHAFT
CLASS 1-J498 b
12/24 d.p. - 17 TEETH
30° PRESSURE ANGLE
FLAT ROOT SIDE FIT

**Shaft code 3**

SAE C SPLINED SHAFT
CLASS 1-J498 b
12/24 d.p. - 14 TEETH
30° PRESSURE ANGLE
FLAT ROOT SIDE FIT

**Shaft code 4**

SAE C SPLINED SHAFT
CLASS 1-J498 b
12/24 d.p. - 11 TEETH
30° PRESSURE ANGLE
FLAT ROOT SIDE FIT

**Adaptor Coupling drive**

<table>
<thead>
<tr>
<th>Coupling drive</th>
<th>SAE A</th>
<th>SAE A 11 teeth</th>
<th>SAE B</th>
<th>SAE B 13 teeth</th>
<th>SAE BB</th>
<th>SAE C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of teeth</td>
<td>9</td>
<td>11</td>
<td>13</td>
<td>13</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Pitch</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
</tr>
<tr>
<td>Pressure angle</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
<td>30°</td>
</tr>
</tbody>
</table>

**OPERATING CHARACTERISTICS - TYPICAL [24 cSt]**

<table>
<thead>
<tr>
<th>Series</th>
<th>Volumetric Displacement Vi</th>
<th>Flow Q [l/min] &amp; n = 1500 RPM</th>
<th>Input power P [kW] &amp; n = 1500 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>p = 0 bar</td>
<td>p = 140 bar</td>
</tr>
<tr>
<td>042</td>
<td>132,3 ml/rev</td>
<td>198,5</td>
<td>188,5</td>
</tr>
<tr>
<td>045</td>
<td>142,4 ml/rev</td>
<td>213,6</td>
<td>203,6</td>
</tr>
<tr>
<td>050</td>
<td>158,5 ml/rev</td>
<td>237,7</td>
<td>227,7</td>
</tr>
<tr>
<td>052</td>
<td>164,8 ml/rev</td>
<td>247,2</td>
<td>237,2</td>
</tr>
<tr>
<td>062</td>
<td>196,7 ml/rev</td>
<td>295,0</td>
<td>285,0</td>
</tr>
<tr>
<td>066</td>
<td>213,3 ml/rev</td>
<td>319,9</td>
<td>309,9</td>
</tr>
<tr>
<td>072</td>
<td>227,1 ml/rev</td>
<td>340,6</td>
<td>330,6</td>
</tr>
</tbody>
</table>

Port connection can be furnished with metric threads.
Catalogue HY29-0027/UK

Parker Hannifin Manufacturing France SAS
VPDE, Denison Vane Pumps
Vierzon - France

Model No. | T6DCCR - 038 - 028 - 008 - 2 R 00 - A 1 - 00 ..
--- | ---
Series | Rear cap end for mounting
SAE A auxiliary pump
Cam ring for “P1”
(Delivery at 0 bar & 1500 r.p.m.)
014 = 71,4 l/min 017 = 87,3 l/min 020 = 99,0 l/min 024 = 119,3 l/min 028 = 134,5 l/min 031 = 147,4 l/min
Cam ring for “P2” & “P3”
(Delivery at 0 bar & 1500 r.p.m.)
003 = 16,2 l/min 005 = 25,8 l/min 006 = 31,9 l/min 008 = 39,6 l/min 010 = 51,1 l/min 012 = 55,6 l/min 014 = 68,9 l/min

Modification
Mounting W/connection variables
4 bolts SAE flange (J518c)

Seal class
1 = S1 (for mineral oil)
4 = S4 (for the resistant fluids)
5 = S5 (for mineral oil and fire resistant fluids)

Design letter
Porting combination (see pages 22 - 23)
00 = standard
01 = clockwise
02 = counter-clockwise

Type of shaft
2 = keyed (SAE CC)
3 = splined (SAE D & E)

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

<table>
<thead>
<tr>
<th>Pressure Port</th>
<th>Series</th>
<th>Volumetric Displacement Vi</th>
<th>Flow Q [l/min] &amp; n = 1500 RPM</th>
<th>Input power P [kW] &amp; n = 1500 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>014</td>
<td>47,6 ml/rev</td>
<td>71,4</td>
<td>62,1</td>
</tr>
<tr>
<td></td>
<td>017</td>
<td>58,2 ml/rev</td>
<td>87,3</td>
<td>78,0</td>
</tr>
<tr>
<td></td>
<td>020</td>
<td>66,0 ml/rev</td>
<td>99,0</td>
<td>89,7</td>
</tr>
<tr>
<td></td>
<td>024</td>
<td>79,5 ml/rev</td>
<td>119,3</td>
<td>110,0</td>
</tr>
<tr>
<td></td>
<td>028</td>
<td>89,7 ml/rev</td>
<td>134,5</td>
<td>125,2</td>
</tr>
<tr>
<td>P2 &amp; P3</td>
<td>031</td>
<td>98,3 ml/rev</td>
<td>147,4</td>
<td>138,1</td>
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<td>035</td>
<td>111,0 ml/rev</td>
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<tr>
<td>038</td>
<td>120,3 ml/rev</td>
<td>180,4</td>
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</tr>
<tr>
<td>042</td>
<td>136,0 ml/rev</td>
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<td>145,7 ml/rev</td>
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<tr>
<td>050</td>
<td>158,0 ml/rev</td>
<td>237,0</td>
<td>227,7</td>
<td>224,0</td>
</tr>
</tbody>
</table>

1) 028 - 031 - 050 = 210 bar max. int.
2) 042 - 045 - 050 = 2200 R.P.M max.
**Technical Data**

**Internal Leakage (Typical)**

- 24 cSt
- 10 cSt

**Internal Leakage vs Pressure**

- Internal leakage $Q_s [l/min]$ vs Pressure $p [bar]$ graph.

**Permissible Radial Load**

- Maximum permissible axial load $F_a = 1200 N$

**Hydraulic Pumps, Fixed**

**Series T6DCCR, Denison Industrial Vane Pumps**

**Hydromechanical Power Loss (Typical)**

- Total hydrodynamic power loss is the sum of each section at its operating conditions.

**Noise Level (Typical)**

- Triple pump noise level is given with each section discharging at the pressure noted on the curve.

**Permissible Radial Load**

- Shaft keyed N°1

**Maximum permissible axial load $F_a = 1200 N$**
Dimensions

**Shaft code 3**
SAE D INVOLUTE SPUR GEAR DATA
CLASS 1 - FLAT ROOT SIDE FIT
PITCH: 8/16 - 13 TEETH
30° PRESSURE ANGLE

**Shaft code 2**
(SAE D 5/4 KEYED)
SAE D 5/4 KEYED
PITCH: 8/16 - 9 TEETH
30° PRESSURE ANGLE

**Shaft torque limits [m/rev x bar]**

<table>
<thead>
<tr>
<th>Pump</th>
<th>Shaft</th>
<th>Vi x p max. P1 + P2 + P3</th>
<th>Coupling</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6DCCR</td>
<td>2</td>
<td>66500</td>
<td>SAE &quot;A&quot;</td>
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<tr>
<td></td>
<td>3</td>
<td>61200</td>
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</table>

**Alternative ports**

<table>
<thead>
<tr>
<th>Port</th>
<th>Code</th>
<th>A</th>
<th>B</th>
<th>Ø C</th>
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<tbody>
<tr>
<td>P3</td>
<td>00</td>
<td>52.4</td>
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<tr>
<td>P3</td>
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<td>47.6</td>
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<td>19.0</td>
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</table>

**Weight:** 62.0 kg
Hydraulic Pumps, Fixed
Series T6EDCR, Denison Industrial Vane Pumps

Dimensions

Weight 100.0 kg
### Operating Characteristics - Typical [24 cSt]

<table>
<thead>
<tr>
<th>Pressure Port</th>
<th>Series</th>
<th>Volumetric Displacement Vl</th>
<th>Flow Q [l/min] &amp; n = 1500 RPM</th>
<th>Input Power P [kW] &amp; n = 1500 RPM</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<td>p = 0 bar</td>
<td>p = 140 bar</td>
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<tr>
<td>P1</td>
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<tr>
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<td>142.4 l/rev</td>
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<tr>
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<tr>
<td></td>
<td>052</td>
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<tr>
<td></td>
<td>062</td>
<td>196.7 l/rev</td>
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<td>285.0</td>
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<td>340.6</td>
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<td>014</td>
<td>47.6 l/rev</td>
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<tr>
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<td>017</td>
<td>58.2 l/rev</td>
<td>87.3</td>
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<tr>
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<td>020</td>
<td>66.0 l/rev</td>
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<tr>
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<td>024</td>
<td>79.5 l/rev</td>
<td>119.3</td>
<td>110.0</td>
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<td>035</td>
<td>111.0 l/rev</td>
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<td>038</td>
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<td>180.4</td>
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<td>042</td>
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<td>006</td>
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<tr>
<td></td>
<td>031</td>
<td>100.0 l/rev</td>
<td>150.0</td>
<td>145.0</td>
</tr>
</tbody>
</table>

1) 028 - 031 - 050 = 210 bar max. int.  
2) 042 - 045 - 050 = 2200 R.P.M. max.
**Technical Data**

### Hydraulic Pumps, Fixed

**Series T6EDCR, Denison Industrial Vane Pumps**

#### Internal Leakage (Typical)

![Graph showing internal leakage at different pressures and viscosities.]

Total leakage is the sum of each section loss at its operating conditions.

Do not operate the pump more than 5 seconds at any speed or viscosity if internal leakage is more than 50% of theoretical flow.

#### Noise Level (Typical)

![Graph showing noise level at different pressures and speeds.]

Triple pump noise level is given with each section discharging at the pressure noted on the curve.

#### Hydromechanical Power Loss (Typical)

![Graph showing hydromechanical power loss at different pressures and speeds.]

Total hydrodynamic power loss is the sum of each section at its operating conditions.

#### Permissible Radial Load

![Graph showing permissible radial load at different speeds and pressures.]

Maximum permissible axial load $F_a = 2000 \text{ N}$

---

Parker Hannifin Manufacturing France SAS
VPDE, Denison Vane Pumps
Vierzon - France
Industrial application

T6DCCR - T6EDCR
(View from shaft end)
### Industrial application

**T6DCCR - T6EDCR**  
(View from shaft end)

<table>
<thead>
<tr>
<th>S</th>
<th>P2</th>
<th>P3</th>
<th>P2</th>
<th>P3</th>
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<tr>
<td></td>
<td>54</td>
<td>55</td>
<td>06</td>
<td>06</td>
</tr>
</tbody>
</table>
Description

Hydraulic Pumps, Fixed
Series T6*R, Denison Mobile Vane Pumps

Adaptors
SAE A
SAE B
SAE C
mounting

Coupling comes in a
variety of options to
meet SAE standards.
SAE A
SAE B
SAE B-B
SAE C

Shaft end outlet port has
4-positions at 90° intervals
relative to inlet.

Front sideplate is clamped
axially by discharge pressure
to reduce internal leakage.

Pilot recess as required by
SAE for full conformity.

Shaft comes in variety of keyed
and splined options to meet
SAE and ISO 3019-1.

Ball bearing holds
shaft in alignment.

Cartridge is a replaceable
assembly including cam ring, rotor,
vanes, pins and sideplate

Vane is urged outward at
suction ramp by pin force
and centrifugal force.

Holes in cam ring
improve wide cartridge
inlet characteristics.

Working vane on
major arc pushes fluid
to discharge port.

Suction ramp
where unloaded
vane moves out.

Discharge ramp
where unloaded
vane moves in.

Working vane on minor arc
seals discharge pressure from
the suction port.

Lub side holes lubricate
the sideplate surface.

Pin cavity is at a steady
pressure slightly higher
than at discharge port.

APPLICATION ADVANTAGES

• High pressure capability up to 275 bar, in a small envelope, reduces the installation costs.
• High mechanical efficiency, typically 94%. Reduced heat generation.
• Wide speed range. Large size cartridge displacements Lowest noise level.
• Low speed 400 RPM, low pressure, high viscosity 2000 cSt allowing applications in cold environments with minimum energy consumption.
• Low ripple pressure reduces the piping noise and increases the life time of other components in the circuit.
• High resistance to particle contamination and increased pump life thanks to the double lip vanes.
• Many of options (cam displacement, shaft, porting) for customized installation.
RECOMMENDED FLUIDS
Petroleum based antiwear R & O fluids. These fluids are the recommended fluids for T6 series pumps. Maximum catalog ratings and performance data are based on operation with these fluids. These fluids are covered by Denison fluid HF-0 and HF-2 specification.

ACCEPTABLE ALTERNATE FLUIDS
The use of fluids other than petroleum based antiwear R & O fluids requires that the maximum ratings of the pumps will be reduced. In some cases the minimum replenishment pressures must be increased. Consult specific sections for more details.

VISCOSITY
Max (cold start, low speed & pressure) 2000 mm²/s (cSt)
Max (full speed & pressure) 108 mm²/s (cSt)
Optimum (max. life) 30 mm²/s (cSt)
Min (full speed & pressure for HF-1, HF-3, HF-4 & HF-5 fluids) 18 mm²/s (cSt)
Min (full speed & pressure for HF-0 & HF-2 fluids) 10 mm²/s (cSt)

VISCOSITY INDEX
90° min. higher values extend range of operating temperatures.
Maximum fluid temperature (ii) °C
HF-0, HF-1, HF-2 + 100°C
HF-3, HF-4 + 50°C
HF-5 + 70°C
Biodegradable fluids (esters & rapeseed base) + 65°C

Minimum fluid temperature (ii) °C
HF-0, HF-1, HF-2, HF-5 - 18°C
HF-3, HF-4 - 10°C
Biodegradable fluids (esters & rapeseed base) - 20°C

FLUID CLEANLINESS
The fluid must be cleaned before and during operation to maintain the contamination level of NAS 1638 class 8 (or ISO 19/17/14) or better. Filters with 25 micron (or better, ß10 ≥ 100) nominal ratings may be adequate but do not guarantee the required cleanliness levels. Suction strainers must be of adequate size to provide the minimum inlet pressure specified. 100 mesh (150 micron) is the finest mesh recommended. Use oversize strainers or omit them altogether on applications which require cold starts or use fire resistant fluids.

OPERATING TEMPERATURES AND VISCOSITIES
Operating temperatures are a function of fluid viscosities, fluid type, and the pump. Fluid viscosity should be selected to provide the optimum viscosity at normal operating temperatures. For cold starts, the pumps should be operated at low speed and pressure until the fluid warms up to an acceptable viscosity for full power operation.

WATER CONTAMINATION IN THE FLUID
Maximum acceptable content of water.
• 0.10% for mineral base fluids.
• 0.05% for synthetic fluids, crankcase oils, biodegradable fluids.
If amount of water is higher then it should be drained off the circuit.

COUPLINGS AND FEMALE SPLINES
• The mating female spline should be free to float and find its own center. If both members are rigidly supported, they must be aligned within 0.15 TIR or less to reduce fretting. The angular alignment of two spline axes must be less than ± 0.05 per 25.4 radius..
• The coupling spline must be lubricated with a lithium molydisulfide grease or a similar lubricant.
• The coupling must be hardened to a hardness between 27 and 45 R.C.
• The female spline must be made to conform to the Class 1 fit as described in SAE-J498b (1971). This is described as a Flat Root Side Fit.

KEYED SHAFTS
Parker supplies the T6 series keyed shaft pumps with high strength heat-treated keys. Therefore, when installing or replacing these pumps, the heat-treated keys must be used in order to insure maximum life in the application. If the key is replaced, it must be a heat-treated key between 27 and 34 R.C. hardness. The corners of the keys must be chamfered from 0.76 to 1.02 at 45° to clear the radii in the key way. The alignment of keyed shafts must be within the tolerances given for splined shafts.

SHAFT LOADS
These products are primarily designed for coaxial drives which do not impose axial or side loading on the shaft. Consult specific sections for more details.
Hydraulic Pumps, Fixed
Series T6CRM, Denison Mobile Vane Pumps

Model No. T6CRM (Y) - B22 - 1 R 00 - A 1 ..

- Modification
- Seal class
  1 = S1 (for mineral oil)
  4 = S4 (for the resistant fluids)
  5 = S5 (for mineral oil and fire resistant fluids)
- Design letter
- Porting adaptor
- Coupling
  1 = SAE A
  4 = SAE C
  2 = SAE B
  5 = SAE J498b
  3 = SAE BB
  16/32 - 11 teeth
- Adaptor
  0 = None
  B = SAE B
  A = SAE A
  C = SAE C

- Type of shaft
  1 = keyed (SAE BB)
  4 = splined (SAE BB)
  2 = keyed (non SAE)
  5 = keyed (non SAE)
  3 = splined (SAE B)

- Direct. of rotation (view on shaft end)
  R = clockwise
  L = counter-clockwise

- Porting combination
  00 = standard

INTERNAL LEAKAGE (TYPICAL)

NOISE LEVEL (TYPICAL) - T6CRM - B22

Do not operate the pump more than 5 seconds at any speed or viscosity if internal leakage is more than 50% of theoretical flow.

POWER LOSS HYDROMECHANICAL (TYPICAL)

PERMISSIBLE RADIAL LOAD

Maximum permissible axial load Fa = 800 N
Hydraulic Pumps, Fixed
Series T6CRM, Denison Mobile Vane Pumps

**Dimensions & Operating characteristics**

**Hydraulic Pumps, Fixed**

**Series T6CRM, Denison Mobile Vane Pumps**

**Weight 20.4 kg**

**Operating Characteristics - Typical [24 cSt]**

<table>
<thead>
<tr>
<th>Series</th>
<th>Volumetric Displacement Vi</th>
<th>Flow Q [l/min] &amp; n = 1500 RPM</th>
<th>Input power P [kW] &amp; n = 1500 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>p = 0 bar</td>
<td>p = 140 bar</td>
</tr>
<tr>
<td>B03</td>
<td>10.8 ml/rev</td>
<td>16,2</td>
<td>11,2</td>
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<tr>
<td>B05</td>
<td>17.2 ml/rev</td>
<td>25,8</td>
<td>20,8</td>
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<tr>
<td>B06</td>
<td>21.3 ml/rev</td>
<td>31,9</td>
<td>26,9</td>
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<td>B08</td>
<td>26.4 ml/rev</td>
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<td>70,3 ml/rev</td>
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<td>B25(1)</td>
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<td>B31(1)</td>
<td>100,0 ml/rev</td>
<td>150,0</td>
<td>145,0</td>
</tr>
</tbody>
</table>

1) B25 - B28 - B31 = 2500 R.P.M. max.  
2) B28 - B31 = 210 bar max. int.  
Port connection can be furnished with metric threads.
Model No. T6DRM (Y) - B45 - 1 R 00 - A 1 0 - A 1 ..

Series
Y = Port flanges with metric threads

Cam ring
(Delivery at 0 bar & 1500 r.p.m.)
B14 = 71,4 l/min
B17 = 87,3 l/min
B20 = 99,0 l/min
B24 = 119,3 l/min
B28 = 134,5 l/min
B31 = 147,4 l/min

Series

Y = Port flanges with metric threads

Cam ring
(Delivery at 0 bar & 1500 r.p.m.)
B14 = 71,4 l/min
B17 = 87,3 l/min
B20 = 99,0 l/min
B24 = 119,3 l/min
B28 = 134,5 l/min
B31 = 147,4 l/min

Type of shaft
1 = keyed (SAE C)
2 = keyed (SAE CC)
3 = splined (SAE C)
5 = keyed (non SAE)

Direct. of rotation (view on shaft end)
R = clockwise
L = counter-clockwise

Porting combination
00 = standard

INTERNAL LEAKAGE (TYPICAL)

Do not operate the pump more than 5 seconds at any speed or viscosity if internal leakage is more than 50% of theoretical flow.

POWER LOSS HYDROMECHANICAL (TYPICAL)

PERMISSIBLE RADIAL LOAD

Maximum permissible axial load Fa = 1200 N

Power loss Ps [kW]

Load F [N]

Shaft keyed N°1
Dimensions & Operating characteristics

Hydraulic Pumps, Fixed
Series T6DRM, Denison Mobile Vane Pumps

Adaptor | D1 | D2 | P | L1 | L2 | L3 | L4 | L5
--- | --- | --- | --- | --- | --- | --- | --- | ---
SAE A | 82,65/82,60 | M10 | 24 | 106,4 | 11,0 | 8,0 | 32,0 | 237,0
SAE B | 101,70/101,65 | M12 | 28 | 146,0 | 16,0 | 8,0 | 46,0 | 251,0
SAE C | 127,10/127,05 | M16 | - | 181,0 | 16,0 | 8,0 | 56,0 | 261,0

Shaft code 1
(KEYED SAE C)

Shaft code 2
(KEYED SAE CG)

Shaft code 3
(KEYED NO SAE)

Adaptor | Coupling drive | SAE A | SAE B | SAE C
--- | --- | --- | --- | ---
Number of teeth | 9 | 11 | 13 | 13 | 15 | 15
Pitch | 16/32 | 16/32 | 16/32 | 16/32 | 16/32 | 12/24
Pressure angle | 30° | 30° | 30° | 30° | 30° | 30°
Major dia, (min) | 15,875 | 19,05 | 22,225 | 22,225 | 25,400 | 31,750
Minor dia. (min) | 12,700 | 16,017 | 19,134 | 19,134 | 22,268 | 27,589

Shaft torque limits [ml/rev x bar]

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Vi x p max.</th>
<th>Coupling drive</th>
<th>Vi x p max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>43240</td>
<td>SAE A</td>
<td>11000</td>
</tr>
<tr>
<td>2</td>
<td>66036</td>
<td>SAE B</td>
<td>20600</td>
</tr>
<tr>
<td>3</td>
<td>61200</td>
<td>SAE BB</td>
<td>32670</td>
</tr>
<tr>
<td>5</td>
<td>55600</td>
<td>SAE C</td>
<td>37390</td>
</tr>
<tr>
<td></td>
<td>SAE - 11 teeth</td>
<td></td>
<td>15850</td>
</tr>
</tbody>
</table>

OPERATING CHARACTERISTICS - TYPICAL [24 cSt]

<table>
<thead>
<tr>
<th>Series</th>
<th>Volumetric Displacement Vi</th>
<th>Flow Q [l/min] &amp; n = 1500 RPM</th>
<th>Input power P [kW] &amp; n = 1500 RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p = 0 bar</td>
<td>p = 140 bar</td>
<td>p = 240 bar</td>
</tr>
<tr>
<td>B014</td>
<td>47,6 ml/rev</td>
<td>71,4</td>
<td>62,1</td>
</tr>
<tr>
<td>B017</td>
<td>58,2 ml/rev</td>
<td>87,3</td>
<td>78,0</td>
</tr>
<tr>
<td>B020</td>
<td>66,0 ml/rev</td>
<td>99,0</td>
<td>89,7</td>
</tr>
<tr>
<td>B024</td>
<td>79,5 ml/rev</td>
<td>119,3</td>
<td>110,0</td>
</tr>
<tr>
<td>B028</td>
<td>89,7 ml/rev</td>
<td>134,5</td>
<td>125,2</td>
</tr>
<tr>
<td>B031</td>
<td>98,3 ml/rev</td>
<td>147,4</td>
<td>138,1</td>
</tr>
<tr>
<td>B035</td>
<td>111,0 ml/rev</td>
<td>166,5</td>
<td>157,2</td>
</tr>
<tr>
<td>B038</td>
<td>120,3 ml/rev</td>
<td>180,4</td>
<td>171,1</td>
</tr>
<tr>
<td>B042</td>
<td>136,0 ml/rev</td>
<td>204,0</td>
<td>194,7</td>
</tr>
<tr>
<td>B045</td>
<td>145,7 ml/rev</td>
<td>218,5</td>
<td>209,2</td>
</tr>
<tr>
<td>B050</td>
<td>158,0 ml/rev</td>
<td>237,0</td>
<td>227,7</td>
</tr>
</tbody>
</table>

Notes:
1) B42 - B45 - B50 = 2200 R.P.M. max.
2) B50 = 210 bar max. int.

Port connection can be furnished with metric threads.
Hydraulic Pumps, Fixed
Series T6ERM, Denison Mobile Vane Pumps

Model No.  T6ERM (Y) - 066 - 1 R 00 - A 1 0 - A 1

Series
Y = Port flanges with metric threads

Cam ring
(Delivery at 0 bar & 1500 r.p.m.)
042 = 198.5 l/min 063 = 296.0 l/min
045 = 213.6 l/min 066 = 319.9 l/min
050 = 237.7 l/min 072 = 340.6 l/min
052 = 247.2 l/min

Type of shaft
1 = keyed (SAE CC)
3 = splined (SAE C)
4 = splined (SAE CC)

Direct. of rotation (view on shaft end)
R = clockwise
L = counter-clockwise

Porting combination
00 = standard

Modification
Seal class
1 = S1 (for mineral oil)
4 = S4 (for the resistant fluids)
5 = S5 (for mineral oil and fire resistant fluids)

Design letter
Porting adaptor

Coupling
1 = SAE A
2 = SAE B
3 = SAE BB
4 = SAE C

Adaptor
0 = None
B = SAE B
A = SAE A
C = SAE C

INTERNAL LEAKAGE (TYPICAL)

NOISE LEVEL (TYPICAL) - T6ERM - 050

Pressure p [bar]
Do not operate the pump more than 5 seconds at any speed or viscosity if internal leakage is more than 50% of theoretical flow.

POWER LOSS HYDROMECHANICAL (TYPICAL)

PERMISSIBLE RADIAL LOAD

Maximum permissible axial load Fa = 2000 N
Hydraulic Pumps, Fixed
Series T6ERM, Denison Mobile Vane Pumps

Dimensions & Operating characteristics

Series Volumetric Displacement Vi

<table>
<thead>
<tr>
<th>Number</th>
<th>Volumetric Displacement Vi</th>
</tr>
</thead>
<tbody>
<tr>
<td>042</td>
<td>132.3 ml/rev</td>
</tr>
<tr>
<td>045</td>
<td>142.4 ml/rev</td>
</tr>
<tr>
<td>050</td>
<td>158.5 ml/rev</td>
</tr>
<tr>
<td>052</td>
<td>164.8 ml/rev</td>
</tr>
<tr>
<td>062</td>
<td>196.7 ml/rev</td>
</tr>
<tr>
<td>066</td>
<td>213.3 ml/rev</td>
</tr>
<tr>
<td>072</td>
<td>227.1 ml/rev</td>
</tr>
</tbody>
</table>

Flow Q [l/min] & n = 1500 RPM

<table>
<thead>
<tr>
<th>Series</th>
<th>Flow Q [l/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>042</td>
<td>198.5</td>
</tr>
<tr>
<td>045</td>
<td>213.6</td>
</tr>
<tr>
<td>050</td>
<td>237.7</td>
</tr>
<tr>
<td>052</td>
<td>247.2</td>
</tr>
<tr>
<td>062</td>
<td>295.0</td>
</tr>
<tr>
<td>066</td>
<td>319.9</td>
</tr>
<tr>
<td>072</td>
<td>340.6</td>
</tr>
</tbody>
</table>

Port connection can be furnished with metric threads.
Hydraulic Pumps, Fixed
Series T6*R, Denison Vane Pumps

Ass'y Tandem VV Porting combination

VV = Vane pump + vane pump
VP = Vane pump + Piston pump (PV)
VG = Vane pump + Gear pump (GP)
VH = Vane pump + Hybrid pump (T6H*)

Assembly screws

- SAE A rear mounting adaptor: 2 screws M10 x 30 (Mounting torque = 49 Nm.)
- SAE B rear mounting adaptor: 2 screws M12 x 35 (Mounting torque = 88 Nm.)
- SAE C rear mounting adaptor: 2 screws M16 x 40 (Mounting torque = 190 Nm.)

ASSEMBLY PORTING COMBINATION

- VV type = Front single vane pump (view from shaft end).

- VV type = For triple vane pump (view from shaft end).
• VP & VH type = For the second pump the reference is the DR drain port on piston pump (view from shaft end).

• VG type = For single vane pump (view from shaft end).

• VG type = For triple vane pump (view from shaft end).
### Adaptor & Coupling selection

**Series T6*R, Denison Vane Pumps**

#### Rear pump

<table>
<thead>
<tr>
<th>Serie</th>
<th>Shaft</th>
<th>Coupling</th>
<th>Adaptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6C*</td>
<td>3</td>
<td>2</td>
<td>B</td>
</tr>
<tr>
<td>T6CR*</td>
<td>4</td>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>T6SH</td>
<td>5</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>T6CC*</td>
<td>3</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>T6<em>D</em></td>
<td>4</td>
<td>2</td>
<td>B</td>
</tr>
<tr>
<td>T6DR*</td>
<td>5</td>
<td>4</td>
<td>C</td>
</tr>
<tr>
<td>T6DC*</td>
<td>6</td>
<td>4</td>
<td>C</td>
</tr>
<tr>
<td>T6DCC*</td>
<td>7</td>
<td>4</td>
<td>C</td>
</tr>
</tbody>
</table>

#### Drive train vane pump

<table>
<thead>
<tr>
<th>T6*R (single pumps)</th>
<th>T6***R (triple pumps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupling</td>
<td>Coupling</td>
</tr>
<tr>
<td>Adaptor</td>
<td>Adaptor</td>
</tr>
</tbody>
</table>

- Not available

#### Shaft

- T6C*
- T6CR*
- T6SH
- T6CC*
- T6*D*
- T6DR*
- T6DC*
- T6DCC*

#### Shaft

- TB
- T7
- T6H***
- PV6
- PV10
- PV15
- PV20
- PV29

#### Shaft

- GP1D
- GP2D
- GP2A
- GP3A

For additional information on Piston or Gear pumps, see the specific bulletins.

### EXAMPLE OF COMBINATION

1. Define front pump
   T6ER - *** - 1 R 02 - B21 - A 1

2. Define rear pump
   T6CC - *** - *** - 5 R 01 - C 100

3. Define mounting
   Ass’y tandem VV03

---

![Diagram of combination](image-url)
WARNING — USER RESPONSIBILITY

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