Hydra-Cell G Series Seal-less Pumps

Hydra-Cell T Series Seal-less Pumps

Hydra-Cell P Series Seal-less Metering Pumps
Hydra-Cell® Seal-less Pumps

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Due to the Wanner Engineering Continuous Improvement Program, specifications and other data in this catalog are subject to change.

Hydra-Cell® is a registered trademark of Wanner Engineering, Inc.
Kel-Cell® is a registered trademark of Wanner Engineering, Inc.

“If the owner of a plant wants cost-effective pumps... he will buy pumps with the lowest Life Cycle Cost. Hydra-Cell is simple in construction, less elaborate in design and physically smaller for equivalent flow/pressure performance. These differences can substantially affect both purchase and operating costs.”

Ing Friedrich-Wilhelm Hennecke, Ph.D.
Chemical Engineering World

Dr. Hennecke served on the Faculty of Chemical Engineering, Karlsruhe, and as a plant engineer, specifying pumps at BASF AG for 30 years.

Wanner International ISO 9001: 2008 Certification

The administration systems of Wanner International Ltd. in connection with pumps and associated products have been assessed and approved by the independent body QAS International to the standards laid down under ISO 9001:2008 (the latest version of ISO 9001).

It covers all aspects of administration including the systems in place for purchase and supply, handling enquiries and orders, internal and external communication, maintenance of records and the creation and handling of documents. It also covers the arrangements made for the continual review and improvement of its QM systems.

The approved administration systems apply to the design, manufacture, assembly and distribution of pumps and associated products.

Wanner International ISO 14001: 2004 Certification

ISO 14001 is an internationally accepted standard that brands a business as environmentally responsible, committed to reducing environmental impacts and meeting expectations of sustainability as the business grows.

To obtain Certification, Wanner International Ltd has undergone a two-part formal assessment by the independent body QAS International to the standards laid down under ISO 14001:2004. This ensures that the necessary ISO 14001 procedures and controls have been developed by the company and that they are being implemented and working satisfactorily as required.
Hydra-Cell® Application Versatility

Hydra-Cell pumps operate reliably and efficiently in commercial, institutional, industrial, and municipal facilities throughout the world. The breadth of the product line offers a wide range of flow capacities and pressure ratings to meet many different requirements. The further capability to provide precise metering and dosing is ideal for many specialised applications. Hydra-Cell pumps can also be fitted with ANSI, DIN, SAE or other specialised flange connections.

Markets and Industries Served

- Automotive
- Biodiesel
- Biotechnical
- Car/Vehicle Washing
- Ceramics
- Chemical & Petrochemical
- Chip Board Manufacturing
- Cleaning & Washing
- Construction
- Electronics
- Emissions & Environmental Control
- Energy & Power Generation
- Energy Recovery - ORC
- Flue Gas Emission Control
- Food & Beverage Processing
- General Industrial & Manufacturing
- Glass & Clay
- Lawn Care & Agriculture
- Marine
- Machine Tool Coolant
- Mining, Quarrying & Tunneling
- Offshore Drilling & Processing
- Oil, Gas & Petrochemical
- Paints, Coatings, Sealants & Adhesives
- Personal Care
- Pharmaceutical
- Polyurethane
- Propellant Packaging
- Pulp & Paper
- Reverse Osmosis & Filtration
- Rubber & Plastic
- Spray Drying
- Steam Generation
- Steel
- Textiles
- Tote, Tank & Barrel Washing
- Water, Effluent & Wastewater Treatment
Hydra-Cell® Primary Pumping Applications

- Blending
- Cleaning
- Coating
- Dosing
- Filling
- Filtering
- Injecting
- Metering
- Mixing
- Sampling
- Spraying
- Transferring

*Hydra-Cell pumps deliver high-pressure, controlled flow of machine tool coolant without the need for fine filtration.*

*High-precision dosing of pentane at low flow rates can be achieved for specialised applications in polyurethane processing.*

*Pumping for waste stream reduction and salt solution concentration at a pharmaceutical chemical plant.*

*Hydra-Cell pumping shear-sensitive polymers for enhanced oil recovery.*

*Hydra-Cell pumps used for ultra-filtration by a food additive manufacturer.*
Handles Low-to-High-Viscosity Liquids
From drinking water to highly viscous cutting liquids, Hydra-Cell pumps handle the full spectrum of process liquids while maintaining high-efficiency operation. This includes non-lubricating liquids as well as difficult liquids with abrasives that can damage or destroy other types of pumps. This makes Hydra-Cell an ideal choice in a wide range of industries and when serving multiple applications in one facility.

Pumping ceramic slurry in a spray drying application can be a problem for other types of pumps, but not Hydra-Cell.

Several operational features of Hydra-Cell pumps are showcased when processing volatile crude oil.

Wastewater treatment is a difficult pumping application that Hydra-Cell routinely handles.

Pumping dirty and recycled water at a commercial car wash is an everyday function for Hydra-Cell pumps.

Hydra-Cell pumping ethanol-based liquid for making jet fuel.
Hydra-Cell® Principles of Operation - Wobble Plate

Wobble Plate Models

1. Drive Shaft
2. Tapered Roller Bearings
3. Fixed-angle Cam/Wobble Plate
4. Hydraulic Cells (Patented)
5. Diaphragms
6. Inlet Valve Assembly
7. Discharge Valve Assembly
8. C62 Pressure Regulating Valve

Reliable, Efficient Pumping Action

The drive shaft (1) is rigidly held in the pump housing by a large tapered roller bearing (2) at the rear of the shaft and a smaller bearing at the front of the shaft. Set between another pair of large bearings is a fixed-angle cam or Wobble Plate (3).

As the drive shaft turns, the swash plate moves, oscillating forward and back (converting axial motion into linear motion). The complete pumping mechanism is submerged in a lubricating oil bath.

The hydraulic cell (4) is moved sequentially by the Wobble plate and filled with oil on their rearward stroke. A ball check valve in the bottom of the piston ensures that the cell remains full of oil on its forward stroke.

The oil held in the Hydra-Cell balances the back side of the diaphragms (5) and causes the diaphragms to flex forward and back as the Wobble plate moves. This provides the pumping action.

To provide long trouble-free diaphragm life, Hydra-Cell hydraulically balances the diaphragm over the complete pressure range of the pump. The diaphragm faces only a 0.21 bar pressure differential regardless of the pressure at which liquid is being delivered - up to 172 bar on standard Hydra-Cell models and Hydra-Cell metering pumps.

Hydra-Cell Wobble plate pumps can have up to five diaphragms, and each diaphragm has its own pumping chamber that contains an inlet and discharge self-aligning horizontal disk check valve assembly (6). As the diaphragms move back, liquid enters the pump through a common inlet and passes through one of the inlet check valves. On the forward stroke, the diaphragm forces the liquid out the discharge check valve (7) and through the manifold common outlet. Equally spaced from one another, the diaphragms operate sequentially to provide consistent, low-pulse flow.

A Hydra-Cell C62 pressure regulating valve (8) is typically installed on the discharge side of the pump to regulate the pressure of downstream process or equipment.
Hydra-Cell® Principles of Operation - Crankshaft

Crank-shaft Models

1. Drive Shaft
2. Precision Ball Bearings
3. Connecting Rods
4. Hydraulic Cells (Patented)
5. Diaphragms
6. Inlet Valve Assembly
7. Discharge Valve Assembly
8. C46 Pressure Regulating Valve (In-line)

Reliable, Efficient Pumping Action

The drive shaft (1) is supported in position by two precision ball bearings (2) positioned at either end of the shaft. Located between these bearings are either one or three cam shaft lobes with connecting rods (3) that are hardened, precision ground, and polished. Maintaining a high level of quality on the cam lobes and connecting rod surfaces ensures proper lubrication and reduced operating temperatures in the hydraulic end of the pump.

As the drive shaft turns, each cam actuates the attached connecting rod that is pinned into position at the end of each hydraulic piston. This action moves the piston forward and backward, converting the axial motion into linear pumping motion. The complete pumping mechanism is submerged in a lubricating oil bath.

Each piston contains a patented hydraulic cell (4) that is moved sequentially by the crank-shaft. The innovative and proprietary Hydra-Cell maintains the precise balance of oil behind the diaphragm (5) regardless of the operating conditions of the pump. The oil in Hydra-Cell is pressurized on the forward stroke of the piston causing the diaphragm to flex, which drives the pumping action. The oil held in the Hydra-Cell balances the diaphragm against the liquid being pumped, maintaining no more than a 0.21 bar differential regardless of the pressure at which the liquid is being delivered - up to 172 bar on standard Hydra-Cell models and Hydra-Cell metering pumps.

Hydra-Cell crank-shaft pumps can have up to three diaphragms, and each diaphragm has its own pumping chamber that contains an inlet and discharge self-aligning horizontal disk check valve assembly (6). As the diaphragms move back, liquid enters the pump through a common inlet and passes through one of the inlet check valves. On the forward stroke, the diaphragm forces the liquid out of the discharge check valve (7) and through the manifold common outlet. Equally spaced from one another, the diaphragms operate sequentially to provide consistent, low-pulse flow.

A Hydra-Cell C46 pressure regulating valve (8) is typically installed on the discharge side of the pump to regulate the pressure of downstream process or equipment.
Hydra-Cell® Principles of Operation - T Series
API 674 option available

Exclusive Seal-less Diaphragm Design

- Seal-less design separates the power end from the process liquid end, eliminating leaks, hazards, and the expense associated with seals and packing
- Low NPSH requirements allow for operation with a vacuum condition on the suction - positive suction pressure is not necessary
- Can operate with a closed or blocked suction line and run dry indefinitely without damage, eliminating downtime and repair costs
- Unique diaphragm design handles more abrasives with less wear than gear, screw or plunger pumps
- Hydraulically balanced diaphragms to handle high pressures with low stress
- Provides low-pulse, linear flow due to its multiple diaphragm design
- Lower energy costs than centrifugal pumps and other pump technologies
- Rugged construction for long life with minimal maintenance
- Compact design and double-ended shaft provides a variety of installation options
- Hydra-Cell T-Series pumps can be configured to meet API 674 standards – consult factory for details

Hydra-Cell T80 Series pumps received a “Spotlight on New Technology” award from the Offshore Technology Conference.
# Hydra-Cell® Compliance Certifications

## ATEX
ATEX is the directive applied to the use and sustainability of equipment allowed for installation in above-ground, explosive atmospheres. The full line of Hydra-Cell ATEX pumps are classified in Group II, Category 2 (Zone 1) for both gasses and dust. Temperature classification is T4 135 °C permitting a maximum process temperature of 90 °C.

## CE Marking
CE identifies compliance of Hydra-Cell pumps with Essential Health and Safety Requirements (EHSR) of the European Union. This includes the Safety of Machinery Directive 98/37/EC.

## DNV
Det Norske Veritas (DNV) is a maritime classification society, that for pumps, details intended service, flow/pressure ratings and service restrictions while specifying the destination vehicle. Hydra-Cell DNV certified pumps overcome the problems associated with pumping and metering low-viscosity, low-sulfur fuels as dictated for use in Sulfur Emissions Control Areas (SECA). They are also used for pumping residual fuel oils, seawater, FGD treatment chemicals, and for ballast treatment.

## GOST-R and RTN
GOST-R is the Certificate of Conformity with Russian Federation norms, allowing for the sale of specified goods in the Russian market. The statutory regulation includes mandatory minimum product safety requirements and conformity with certain technical standards and requirements.

## ISO 9001: 2008
ISO 9001 is an independent continuing assessment of an organisation’s arrangements for Quality Management. It covers all aspects of administration including the systems in place for purchase and supply, handling enquiries and orders, internal and external communication, maintenance of records and the creation and handling of documents. It also covers the arrangements made for the continual review and improvement of its QM systems. The administration systems of Wanner International Ltd in connection with pumps and associated products have been assessed and approved by the independent body QAS International to the standards laid down under ISO 9001:2008 (the latest version of ISO 9001).

## ISO 14001: 2004
ISO 14001 is an internationally accepted standard that brands a business as environmentally responsible, committed to reducing environmental impacts and meeting expectations of sustainability as the business grows. To obtain Certification, Wanner International Ltd has undergone a two-part formal assessment by the independent body QAS International to the standards laid down under ISO 14001:2004. This ensures that the necessary ISO 14001 procedures and controls have been developed by the company and that they are being implemented and working satisfactorily as required.

## LLOYDS REGISTER
Wanner International is able to supply Hydra-Cell pumps for marine duties in compliance with the requirements of Lloyd’s Register. Certificates for these pumps, backed by independent Witness Tests, have been issued by LR for duties that include transfer of low-sulphur fuels. LR certificated Hydra-Cell diaphragm pumps overcome difficulties associated with pumping light viscosity oils and other poor lubricants.
Hydra-Cell® Materials of Construction

As part of our “Mass Customisation” philosophy, every Hydra-Cell pump is built with manifolds, elastomeric materials, and valve assemblies using construction materials specified by the customer. Hydra-Cell distributors and factory representatives are readily available to assist customers in selecting the materials best suited to the process application. (The range of material choices depends on each pump model – for example, models designed to operate at higher pressures are available with metallic pump heads only.)

Manifolds

Manifolds for Hydra-Cell pumps are available in a variety of materials to suit your process application. They are easy to replace and interchangeable to accommodate different liquids processed by the same pump. Special manifolds with a 2:1 dosing ratio are also available. (*Consult factory.*)

Metallic Pump Heads

Metallic pump heads can handle higher operating pressures. Hastelloy CW12MW or Stainless Steel is also selected for corrosion resistance and other properties.

- Brass
- Bronze
- Cast Iron (Nickel-plated)
- Duplex Alloy 2205
- Super Duplex Alloy 2507
- Hastelloy CW12MW
- Nickel Alloy
- 304 Stainless Steel
- 316L Stainless Steel

Non-metallic Pump Heads

Non-metallic pump heads are often used when a corrosive or aggressive liquid is being processed at lower pressures.

- Polypropylene
- PVDF

Diaphragms and O-rings

Diaphragms and corresponding O-rings are available in several elastomeric materials.

- Aflas (used with PTFE O-ring)
- Buna-N
- EPDM (requires EPDM-compatible oil)
- FFKM
- FKM
- Neoprene
- PTFE
Valve Materials

Hydra-Cell valve assemblies (seats, valves, springs, and retainers) are available in a variety of materials to suit your process application.

Valve Seats
- Ceramic
- Hastelloy CW12MW
- Nitronic 50
- Tungsten Carbide
- 17-4 PH Stainless Steel
- 316L Stainless Steel

Valves
- Ceramic
- Hastelloy CW12MW
- Nitronic 50
- Tungsten Carbide
- 17-4 PH Stainless Steel

Valve Springs
- Elgiloy (Exceeds SST grade 316L)
- Hastelloy CW12MW
- 17-7 PH Stainless Steel
- 316L Stainless Steel

Valve Spring Retainers
- Celcon
- Hastelloy CW12MW
- Nylon (Zytel)
- Polypropylene
- PVDF
- 17-7 PH Stainless Steel

Registered trademarks of materials:

- Aflas®: Asahi Glass Co., Ltd.
- Celcon®: Celanese Company
- Elgiloy®: Elgiloy Limited Partnership
- Kynar® (PVDF): Arkema, Inc.
- Mesamoll®: Lanxess Deutschland GmbH
- Nitronic® 50: AK Steel Corporation
- Viton® (FKM): DuPont Performance Elastomers, LLC
Hydra-Cell® G and T Series Seal-less Pumps Selection

G20

G03

G03 Mono-Block

G04

G10

G12

G15

G17

G25

G35

T8045

T8030
The graph above displays the maximum flow capacity at a given pressure for each model series. The table below lists the maximum flow capacity and maximum pressure capability of each model series.

Please Note: Some models do not achieve maximum flow at maximum pressure. Refer to the individual model specifications in this section for precise flow and pressure capabilities by specific pump configuration.

<table>
<thead>
<tr>
<th>Model</th>
<th>Maximum Capacity l/min</th>
<th>Maximum Discharge Pressure bar</th>
<th>Maximum Operating Temperature °C</th>
<th>Maximum Inlet Pressure bar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Non-Metallic</td>
<td>Metallic</td>
<td>Non-Metallic</td>
</tr>
<tr>
<td>G20</td>
<td>3.8</td>
<td>24</td>
<td>103</td>
<td>60°</td>
</tr>
<tr>
<td>G03</td>
<td>11.7</td>
<td>24</td>
<td>103</td>
<td>60°</td>
</tr>
<tr>
<td>G04</td>
<td>11.2</td>
<td>N/A</td>
<td>172</td>
<td>N/A</td>
</tr>
<tr>
<td>G10</td>
<td>33.4</td>
<td>24</td>
<td>103</td>
<td>60°</td>
</tr>
<tr>
<td>G12</td>
<td>33.4</td>
<td>N/A</td>
<td>103</td>
<td>N/A</td>
</tr>
<tr>
<td>G15/17</td>
<td>58.7</td>
<td>N/A</td>
<td>172</td>
<td>N/A</td>
</tr>
<tr>
<td>G25</td>
<td>75.9</td>
<td>24</td>
<td>69</td>
<td>60°</td>
</tr>
<tr>
<td>G35</td>
<td>138</td>
<td>N/A</td>
<td>103</td>
<td>N/A</td>
</tr>
<tr>
<td>T8045</td>
<td>170.4</td>
<td>N/A</td>
<td>207</td>
<td>N/A</td>
</tr>
<tr>
<td>T8030</td>
<td>98.4</td>
<td>N/A</td>
<td>345</td>
<td>N/A</td>
</tr>
</tbody>
</table>

1 24 bar maximum with PVDF (Kynar®) liquid end; 17 bar maximum with Polypropylene liquid end.
2 Consult factory for correct component selection for temperatures from 160°F (71°C) to 250°F (121°C).
Hydra-Cell® G Series Performance Graphs and Specifications

**G20**

- **Maximum Particle Size**: 0.3mm @ 15% max. concentration
- **Inlet Port**: 1/2 inch BSPT (NPT option available)
- **Discharge Port**: 3/8 inch BSPT (NPT option available)
- **Shaft Diameter**
  - G-20: 3/4 inch (19mm) hollow shaft
  - G-21/22: 3/4 inch (19mm)
- **Shaft Rotation**: Bi-directional
- **Weight**
  - Metallic Heads: 5.5 kg
  - Non-Metallic Heads: 4.1 kg

**Calculating Required Horsepower (kW)**

\[
\text{rpm + 1000} \quad + \quad \frac{\text{gpm x psi}}{1,460} = \text{electric motor HP*}
\]

\[
\text{rpm + 1000} \quad + \quad \frac{\text{l/min x bar}}{511} = \text{electric motor kW*}
\]

* rpm equals pump shaft rpm. HP/kW is required application power. Use caution when sizing motors with variable speed drives.

Note: For the low flow cams (B, G, I), a pressurised inlet feed must be used. Performance specifications are guidelines only.

**G03**

- **Maximum Particle Size**: 0.3mm @ 15% max. concentration
- **Inlet Port**: 1/2 inch BSPT (NPT option available)
- **Discharge Port**: 3/8 inch BSPT (NPT option available)
- **Shaft Diameter**
  - G-03: 3/4 inch (19mm)
  - G-13: 24 mm hollow shaft
- **Shaft Rotation**: Bi-directional
- **Weight**
  - Metallic Heads: 12.7 kg
  - Non-Metallic Heads: 8.6 kg

**Calculating Required Horsepower (kW)**

\[
\text{rpm + 1000} \quad + \quad \frac{\text{gpm x psi}}{1,460} = \text{electric motor HP*}
\]

\[
\text{rpm + 1000} \quad + \quad \frac{\text{l/min x bar}}{511} = \text{electric motor kW*}
\]
Hydra-Cell® G Series Performance Graphs and Specifications

**Hydra-Cell® G Series Performance Graphs and Specifications**

**Go4**

**G10 - API 674 Option Available**

**Calculating Required Horsepower (kW)**

\[
\text{Electric motor HP} = \frac{6 \times \text{rpm}}{63,000} + \frac{\text{gpm} \times \text{psi}}{1,460}
\]

**Calculating Required Horsepower (kW)**

\[
\text{Electric motor kW} = \frac{15 \times \text{rpm}}{84,428} + \frac{\text{l/min} \times \text{bar}}{511}
\]

* rpm equals pump shaft rpm. HP/kW is required application power. Use caution when sizing motors with variable speed drives.

Note: For the low flow cams (B, G, I), a pressurised inlet feed must be used. Performance specifications are guidelines only.
Hydra-Cell® G Series Performance Graphs and Specifications

G12

- **Maximum Particle Size**: 0.8mm @ 5-10% max. concentration
- **Inlet Port**: 1 inch BSPT (NPT option available)
- **Discharge Port**: 3/4 inch BSPT (NPT option available)
- **Shaft Diameter**: 7/8 inch (22.22 mm)
- **Shaft Rotation**: Bi-directional
- **Weight**: Metallic Heads: 22 kg, Non-Metallic Heads: 16 kg

**Calculating Required Horsepower (kW)**

\[
\text{Electric motor HP}^* = \frac{15 \times \text{rpm}}{63,000} + \frac{\text{gpm} \times \text{psi}}{1,460}
\]

\[
\text{Electric motor kW}^* = \frac{15 \times \text{rpm}}{84,428} + \frac{\text{l/min} \times \text{bar}}{511}
\]

* rpm equals pump shaft rpm. HP/kW is required application power. Use caution when sizing motors with variable speed drives.

Note: For the low flow cams (B, G, I), a pressurised inlet feed must be used. Performance specifications are guidelines only.

G15 (horizontal) G17 (vertical) - API 674 Option Available

- **Maximum Particle Size**: 0.3mm @ 15% max. concentration
- **Inlet Port**: 1-1/4 inch BSPT (NPT option available)
- **Discharge Port**: 3/4 inch BSPT (NPT option available)
- **Shaft Diameter**: 7/8 inch (22.22 mm)
- **Shaft Rotation**: Bi-directional
- **Weight**: Metallic Heads: 22 kg, Non-Metallic Heads: 16 kg

**Calculating Required Horsepower (kW)**

\[
\text{Electric motor HP}^* = \frac{80 \times \text{rpm}}{63,000} + \frac{\text{gpm} \times \text{psi}}{1,460}
\]

\[
\text{Electric motor kW}^* = \frac{80 \times \text{rpm}}{84,428} + \frac{\text{l/min} \times \text{bar}}{511}
\]

* rpm equals pump shaft rpm. HP/kW is required application power. Use caution when sizing motors with variable speed drives.

Note: For the low flow cams (B, G, I), a pressurised inlet feed must be used. Performance specifications are guidelines only.

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Hydra-Cell® G Series Performance Graphs and Specifications

G25 - API 674 Option Available

- Maximum Particle Size: 1.5mm @ 5-10% max. concentration
- Inlet Port: 1-1/2 inch BSPT (NPT option available)
- Discharge Port: 1 inch BSPT (NPT option available)
- Shaft Diameter: 1-1/8 inch (28.58 mm)
- Shaft Rotation: Bi-directional
- Weight: Metallic Heads: 56.8 kg, Non-Metallic Heads: 40.9 kg

Calculating Required Horsepower (kW)*

\[
\frac{50 \times \text{rpm}}{63,000} + \frac{\text{gpm} \times \text{psi}}{1,460} = \text{electric motor HP}^* \\
\frac{50 \times \text{rpm}}{84,428} + \frac{l/min \times \text{bar}}{511} = \text{electric motor kW}^*
\]

G35 - API 674 Option Available

- Maximum Particle Size: 1.5mm @ 5-10% max. concentration
- Inlet Port: 2-1/2 inch BSPT (NPT option available) or 3 inch SAE flange
- Discharge Port: 1-1/4 inch BSPT (NPT option available) or 1-1/4 inch SAE flange
- Shaft Diameter: 2 inch (50.8 mm)
- Shaft Rotation: Bi-directional
- Weight: 109 kg

Calculating Required Horsepower (kW)*

\[
\frac{100 \times \text{rpm}}{63,000} + \frac{\text{gpm} \times \text{psi}}{1,460} = \text{electric motor HP}^* \\
\frac{100 \times \text{rpm}}{84,428} + \frac{l/min \times \text{bar}}{511} = \text{electric motor kW}^*
\]

* rpm equals pump shaft rpm. HP/kW is required application power. Use caution when sizing motors with variable speed drives.
Note: For the low flow cams (B, G, I), a pressurised inlet feed must be used. Performance specifications are guidelines only.
**Hydra-Cell® T Series Performance Graphs and Specifications**

**T8045 - API 674 Option Available**

- **Maximum Particle Size**: 0.8mm
- **Inlet Port**: Two 3-1/2 inch 300 lbs RF ANSI or 2-1/2 inch NPT
- **Discharge Port**: Two 1-1/4 inch, 2,500 lbs RTJ ANSI or 1-1/2 inch NPT
- **Input Shaft**: Left or right side
- **Shaft Diameter**: 76.2mm
- **Shaft Rotation**: Bi-directional
- **Weight**: 499 kg

**Calculating Required Horsepower (kW)**

\[
\text{gpm x psi} \quad \frac{1,460}{1,460} = \text{electric motor HP*} \\
\text{l/min x bar} \quad \frac{511}{511} = \text{electric motor kW*}
\]

* rpm equals pump shaft rpm. HP/kW is required application power. Use caution when sizing motors with variable speed drives. Performance specifications are guidelines only.

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**T8030 - API 674 Option Available**

- **Maximum Particle Size**: 0.8mm
- **Inlet Port**: Two 2 inch 300 lbs ANSI FF flange
- **Discharge Port**: Two 1-1/4 inch, 2,500 lbs ANSI RTJ flange
- **Input Shaft**: Left or right side
- **Shaft Diameter**: 76.2mm
- **Shaft Rotation**: Bi-directional
- **Weight**: 499 kg

**Calculating Required Horsepower (kW)**

\[
\text{gpm x psi} \quad \frac{1,460}{1,460} = \text{electric motor HP*} \\
\text{l/min x bar} \quad \frac{511}{511} = \text{electric motor kW*}
\]

* rpm equals pump shaft rpm. HP/kW is required application power. Use caution when sizing motors with variable speed drives. Performance specifications are guidelines only.
C Series Valves Selection Guide

Performance Advantages
- Accurate and repeatable
- Adjustable
- Immediate response
- Smooth, chatter-free bypass
- No external springs or moving parts
- Flow-through design with minimal pressure surge
- Heavy-duty construction - made in the USA

Design Advantages
Tapered design of the C20 Series valves plunger.

Seal-less Diaphragm
C60 Series valves feature a seal-less diaphragm with a tapered plunger, making the valves ideal for high-pressure requirements and handling dirty fluids.
Hydra-Cell® G Series Dosing Performance Pumps

G22 Dosing

G13 Dosing

G04 Dosing

G10 Dosing

G25 Dosing

G35 Dosing
Hydra-Cell® Series Dosing Performance Pumps

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjustable Flow Range</th>
<th>Maximum Discharge</th>
<th>Maximum Operating</th>
<th>Maximum Inlet Pressure</th>
<th>Non-Metallic</th>
<th>Metallic</th>
<th>Non-Metallic</th>
<th>Metallic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum Capacity l/hr</td>
<td>Maximum Capacity l/hr</td>
<td>Pressure bar</td>
<td>Temperature °C</td>
<td>Pressure bar</td>
<td>Temperature °C</td>
<td>Pressure bar</td>
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<tr>
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<td>60°</td>
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<tr>
<td>G22 - M2L</td>
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<td>60°</td>
<td>121°</td>
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<tr>
<td>G13 - M2L</td>
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<td>462</td>
<td>N/A</td>
<td>20</td>
<td>N/A</td>
<td>121°</td>
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<tr>
<td>G13 - M4L</td>
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<td>462</td>
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<td>462</td>
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<td>100</td>
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<td>121°</td>
<td>17</td>
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<tr>
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<td>G10 - M2L</td>
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<td>121°</td>
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<td>G25 - M4L</td>
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<td>20</td>
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<td>121°</td>
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<tr>
<td>G25 - M4M</td>
<td>216</td>
<td>2600</td>
<td>24</td>
<td>60</td>
<td>60°</td>
<td>121°</td>
<td>17</td>
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<tr>
<td>G35 - M4L</td>
<td>396</td>
<td>4800</td>
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<td>N/A</td>
<td>82°</td>
<td>34</td>
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<tr>
<td>G35 - M2L</td>
<td>792</td>
<td>6360</td>
<td>N/A</td>
<td>10</td>
<td>N/A</td>
<td>82°</td>
<td>34</td>
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</tr>
</tbody>
</table>

1 24 bar maximum with PVDF (Kynar®) liquid end; 17 bar maximum with Polypropylene liquid end.
2 Consult factory for correct component selection for temperatures from 160°F (71°C) to 250°F (121°C).
3 Refer to G Series datasheets for relevant material selections.
Hydra-Cell® P Series Flow Capacities and Pressure Ratings

<table>
<thead>
<tr>
<th>Model</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>P100</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>P200</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>P300</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>P400</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>P500</td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
<tr>
<td>P600</td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
</tbody>
</table>
Hydra-Cell® P Series Flow Capacities and Pressure Ratings

P Series Electronic Precision Metering Pumps

![Graph showing flow and pressure for different models of P Series pumps.]

<table>
<thead>
<tr>
<th>Model</th>
<th>Maximum Capacity l/hr</th>
<th>Maximum Discharge Pressure bar</th>
<th>Maximum Operating Temperature °C</th>
<th>Maximum Inlet Pressure bar</th>
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</thead>
<tbody>
<tr>
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<td>103</td>
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<tr>
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</tr>
<tr>
<td>P400</td>
<td>714.9</td>
<td>24</td>
<td>69</td>
<td>60°</td>
</tr>
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<td>P500</td>
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<td>172</td>
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<tr>
<td>P600</td>
<td>2634.0</td>
<td>24</td>
<td>69</td>
<td>60°</td>
</tr>
</tbody>
</table>

1 Ratings are for X-Cam design  
2 24 bar maximum with PVDF (Kynar®) liquid end; 17 bar maximum with Polypropylene liquid end.  
3 Consult factory for correct component selection for temperatures above 71°C

Hydra-Cell® P Series Pumps Exceed API 675 Performance Standards

Hydra Cell Metering Solutions pumps meet or exceed API 675 performance standards for Steady-State Accuracy (± 1%), Linearity (± 3%) and Repeatability (± 3%).
Hydra-Cell® P Series Flow Capacities and Pressure Ratings

**P100**

### L/hr Maximum Flow at Designated Pressure

<table>
<thead>
<tr>
<th>All Pumps (l/hr)</th>
<th>Metallic Pump Heads Only (l/hr)</th>
<th>Pump Gearbox Ratio</th>
<th>Motor rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.425</td>
<td>3.396</td>
<td>3.337</td>
<td>3.203</td>
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<td>4.150</td>
<td>4.102</td>
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<tr>
<td>5.140</td>
<td>5.135</td>
<td>4.841</td>
<td>4.708</td>
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<tr>
<td>6.916</td>
<td>6.884</td>
<td>6.777</td>
<td>6.486</td>
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<tr>
<td>8.336</td>
<td>8.283</td>
<td>8.145</td>
<td>7.801</td>
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<tr>
<td>10.47</td>
<td>10.38</td>
<td>9.746</td>
<td>9.507</td>
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<tr>
<td>14.02</td>
<td>13.88</td>
<td>13.61</td>
<td>12.71</td>
</tr>
<tr>
<td>21.12</td>
<td>20.88</td>
<td>20.45</td>
<td>19.11</td>
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<td>28.22</td>
<td>27.87</td>
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<td>25.50</td>
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<tr>
<td>42.43</td>
<td>41.87</td>
<td>40.96</td>
<td>39.37</td>
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<tr>
<td>55.63</td>
<td>55.86</td>
<td>54.64</td>
<td>52.53</td>
</tr>
<tr>
<td>85.04</td>
<td>83.85</td>
<td>81.98</td>
<td>78.84</td>
</tr>
</tbody>
</table>

### Performance Specifications

- **Maximum Particle Size**: 0.3mm @ 15% max. concentration
- **Inlet Port**: 1/2 inch BSPT
- **Discharge Port**: 3/8 inch BSPT
- **Weight (less motor)**:
  - Metallic head: 9.7 kg (21.3 lbs)
  - Non-metallic head: 8.7 kg (19.2 lbs)

**P200**

### L/hr Maximum Flow at Designated Pressure

<table>
<thead>
<tr>
<th>All Pumps (l/hr)</th>
<th>Metallic Pump Heads Only (l/hr)</th>
<th>Pump Gearbox Ratio</th>
<th>Motor rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.65</td>
<td>10.48</td>
<td>10.25</td>
<td>9.868</td>
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<td>12.81</td>
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<td>11.91</td>
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<td>16.00</td>
<td>15.82</td>
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<td>14.98</td>
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<td>21.32</td>
<td>21.09</td>
<td>20.68</td>
<td>20.04</td>
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<td>25.57</td>
<td>25.31</td>
<td>24.83</td>
<td>24.09</td>
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<td>31.96</td>
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<td>42.59</td>
<td>42.17</td>
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<td>60.55</td>
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<td>124.6</td>
<td>121.3</td>
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<tr>
<td>255.4</td>
<td>253.0</td>
<td>249.2</td>
<td>242.8</td>
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</table>

### Performance Specifications

- **Maximum Particle Size**: 0.3mm @ 15% max. concentration
- **Inlet Port**: 1/2 inch BSPT
- **Discharge Port**: 3/8 inch BSPT
- **Weight (less motor)**:
  - Metallic head: 19.0 kg (41.8 lbs)
  - Non-metallic head: 14.9 kg (32.8 lbs)

Performance specifications are guidelines only.
## L/hr Maximum Flow at Designated Pressure

<table>
<thead>
<tr>
<th>Pressure (Bar)</th>
<th>Metallic Pump Heads Only</th>
<th>L/hr All Pumps</th>
<th>L/hr Metallic Pump Heads Only</th>
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</thead>
<tbody>
<tr>
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<td>10.16</td>
<td>10.04</td>
<td>9.51</td>
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<tr>
<td>10</td>
<td>12.29</td>
<td>12.14</td>
<td>11.53</td>
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<tr>
<td>15</td>
<td>15.58</td>
<td>15.40</td>
<td>14.53</td>
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<td>20</td>
<td>20.94</td>
<td>20.66</td>
<td>19.54</td>
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<td>25</td>
<td>25.23</td>
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<tr>
<td>31</td>
<td>31.66</td>
<td>31.17</td>
<td>29.55</td>
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<tr>
<td>42</td>
<td>42.39</td>
<td>41.68</td>
<td>39.56</td>
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<td>63</td>
<td>63.83</td>
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<td>119.7</td>
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<td>171.1</td>
<td>167.8</td>
<td>159.7</td>
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<tr>
<td>256</td>
<td>256.8</td>
<td>251.9</td>
<td>239.8</td>
</tr>
</tbody>
</table>

### Required Motor kW

- P300: 0.18, 0.37, 0.55, 0.75
- P400: 1.1, 1.5, 2.2

*Capacity data is shown for pumps with elastomeric diaphragms. Consult factory for performance characteristics with PTFE diaphragms.

### Maximum Particle Size

- **P300:** 0.3mm @ 15% max. concentration
- **P400:** 0.8mm @ 5-10% max. concentration

### Inlet Port

- **P300:** 1/2 inch BSPT
- **P400:** 1 inch BSPT

### Discharge Port

- **P300:** 1/2 inch BSPT
- **P400:** 3/4 inch BSPT

### Weight (less motor)

- **P300:** 24.7 kg (54.5 lbs)
- **P400:** 29.7 kg (65.5 lbs)

**Maximum Particle Size**

<table>
<thead>
<tr>
<th>Weight (less motor)</th>
<th>24.7 kg (54.5 lbs)</th>
<th>29.7 kg (65.5 lbs)</th>
</tr>
</thead>
</table>

**Inlet Port**

- **P300:** 1/2 inch BSPT
- **P400:** 1 inch BSPT

**Discharge Port**

- **P300:** 1/2 inch BSPT
- **P400:** 3/4 inch BSPT

**Maximum Particle Size**

<table>
<thead>
<tr>
<th>Maximum Particle Size</th>
<th>0.3mm @ 15% max. concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inlet Port</strong></td>
<td>1/2 inch BSPT</td>
</tr>
<tr>
<td><strong>Discharge Port</strong></td>
<td>1/2 inch BSPT</td>
</tr>
<tr>
<td><strong>Weight (less motor)</strong></td>
<td>24.7 kg (54.5 lbs)</td>
</tr>
</tbody>
</table>

**Maximum Particle Size**

<table>
<thead>
<tr>
<th>Maximum Particle Size</th>
<th>0.8mm @ 5-10% max. concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inlet Port</strong></td>
<td>1 inch BSPT</td>
</tr>
<tr>
<td><strong>Discharge Port</strong></td>
<td>3/4 inch BSPT</td>
</tr>
<tr>
<td><strong>Weight (less metal)</strong></td>
<td>29.7 kg (65.5 lbs)</td>
</tr>
</tbody>
</table>

**Weight (less metal)**

- **Metallic head:** 29.7 kg (65.5 lbs)
- **Non-metallic head:** 23.8 kg (52.5 lbs)
# Hydra-Cell® P Series Performance Graphs and Specifications

## Required Motor kW

<table>
<thead>
<tr>
<th>L/hr Metallic Pump Heads Only</th>
<th>Motor RPM</th>
<th>Gear Ratio</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Bar</td>
<td>55.14</td>
<td>25</td>
<td>50:1</td>
</tr>
<tr>
<td>17 Bar</td>
<td>66.16</td>
<td>30</td>
<td>50:1</td>
</tr>
<tr>
<td>35 Bar</td>
<td>81.25</td>
<td>37.5</td>
<td>40:1</td>
</tr>
<tr>
<td>70 Bar</td>
<td>111.26</td>
<td>50</td>
<td>30:1</td>
</tr>
<tr>
<td>35 Bar</td>
<td>133.66</td>
<td>60</td>
<td>25:1</td>
</tr>
<tr>
<td>17 Bar</td>
<td>167.27</td>
<td>75</td>
<td>20:1</td>
</tr>
<tr>
<td>7 Bar</td>
<td>223.28</td>
<td>100</td>
<td>15:1</td>
</tr>
<tr>
<td>17 Bar</td>
<td>335.31</td>
<td>150</td>
<td>10:1</td>
</tr>
<tr>
<td>35 Bar</td>
<td>447.33</td>
<td>200</td>
<td>7.5:1</td>
</tr>
<tr>
<td>7 Bar</td>
<td>671.4</td>
<td>300</td>
<td>5:1</td>
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<tr>
<td>17 Bar</td>
<td>895.4</td>
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</tr>
<tr>
<td>35 Bar</td>
<td>1343.5</td>
<td>600</td>
<td>5:1</td>
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</table>

## Maximum Particle Size

- **Maximum Particle Size**: 0.3mm @ 15% max. concentration
- **Inlet Port**: 1-1/4 inch BSPT
- **Discharge Port**: 3/4 inch BSPT
- **Weight (less motor)**: 88.5 kg (192.1 lbs)

## L/hr Maximum Flow at Designated Pressure

### P500

<table>
<thead>
<tr>
<th>L/hr Metallic Pump Heads Only</th>
<th>Pump RPM</th>
<th>Gear Ratio</th>
<th>RPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Bar</td>
<td>113.9</td>
<td>25</td>
<td>60:1</td>
</tr>
<tr>
<td>17 Bar</td>
<td>137.2</td>
<td>30</td>
<td>50:1</td>
</tr>
<tr>
<td>35 Bar</td>
<td>168.4</td>
<td>37.5</td>
<td>40:1</td>
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<tr>
<td>70 Bar</td>
<td>225.8</td>
<td>50</td>
<td>30:1</td>
</tr>
<tr>
<td>35 Bar</td>
<td>271.7</td>
<td>60</td>
<td>25:1</td>
</tr>
<tr>
<td>17 Bar</td>
<td>340.5</td>
<td>75</td>
<td>20:1</td>
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<tr>
<td>7 Bar</td>
<td>455.2</td>
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<td>15:1</td>
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<tr>
<td>17 Bar</td>
<td>684.7</td>
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<td>10:1</td>
</tr>
<tr>
<td>35 Bar</td>
<td>914.1</td>
<td>200</td>
<td>7.5:1</td>
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<tr>
<td>7 Bar</td>
<td>1326</td>
<td>300</td>
<td>5:1</td>
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<td>17 Bar</td>
<td>1769</td>
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<tr>
<td>35 Bar</td>
<td>2656</td>
<td>600</td>
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### P600

<table>
<thead>
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<th>L/hr Metallic Pump Heads Only</th>
<th>Pump RPM</th>
<th>Gear Ratio</th>
<th>RPM</th>
</tr>
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<td>60:1</td>
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<td>17 Bar</td>
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<td>172.0</td>
<td>37.5</td>
<td>40:1</td>
</tr>
<tr>
<td>70 Bar</td>
<td>225.8</td>
<td>50</td>
<td>30:1</td>
</tr>
<tr>
<td>35 Bar</td>
<td>271.7</td>
<td>60</td>
<td>25:1</td>
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<tr>
<td>17 Bar</td>
<td>340.5</td>
<td>75</td>
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<tr>
<td>7 Bar</td>
<td>455.2</td>
<td>100</td>
<td>15:1</td>
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<tr>
<td>17 Bar</td>
<td>684.7</td>
<td>150</td>
<td>10:1</td>
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<tr>
<td>35 Bar</td>
<td>914.1</td>
<td>200</td>
<td>7.5:1</td>
</tr>
<tr>
<td>7 Bar</td>
<td>1326</td>
<td>300</td>
<td>5:1</td>
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<tr>
<td>17 Bar</td>
<td>1769</td>
<td>400</td>
<td>7.5:1</td>
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<tr>
<td>35 Bar</td>
<td>2656</td>
<td>600</td>
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## Performance specifications are guidelines only.

* Capacity data is shown for pumps with elastomeric diaphragms. Consult factory for performance characteristics of pumps with PTFE diaphragms.
Hydra-Cell® Control Options

Electronic Control
- ATEX Dust Zone 21 (Ex tb III C T125c Db)
- IP55 Standard
- Flow adjustment scale via hand-wheel

Control Freak
- Multiple Variable Frequency Dive (VFD) options
- Enables programming for flow rate or totalisation
- Option available to control multiple pumps with one Hydra-Cell “Control Freak”

Mechanical Adjustment
- ATEX Zone 1
- Linear fine adjustment scale on hand-wheel
- High reliability due to frictionless design
Hydra-Cell® Pumps Accessories and Options

Pump & Motor Adaptors:

Hydra-Oil Lubricants:
Hydra-Oil is specially formulated to maximize performance of Hydra-Cell pumps.
- Reduce wear
- Withstand extreme temperature changes
- Improve pump performance
- Extend pump life
- Maintain consistent viscosity
- Withstand extreme pressures

Tool Kits:
Customized for your specific pump model, Hydra-Cell Tool Kits provide specialty tools to facilitate maintenance and servicing of your Hydra-Cell pump. Each kit is packaged in a durable plastic case and includes a shaft rotator, valve seat remover, plunger guide lifter, plunger holder, protector seal, seal inserter, and assembly studs.

Back Pressure & Pressure Relief Valves:
Back pressure valves help ensure that your Hydra-Cell pump provides accurate and predictable flow. Pressure relief valves protect your pump and system from over-pressure situations.

Pulsation Dampeners:
Pulsation dampeners protect your pumping system and its components by removing virtually all hydraulic shock and vibration resulting from the reciprocating stroking action of a positive displacement pump.

They control pulsations by allowing fluid to enter a wetted chamber of the dampener during the discharge stroke. This displaces a flexible bladder, which compresses gas in an air chamber, thus absorbing the shock. During the inlet stroke, liquid pressure decreases as the dampener gas expands, allowing fluid to re-enter the process line.

Bladders are available in Neoprene, Buna-N, EPDM, FKM, and PTFE (except where noted) to match Hydra-Cell pump diaphragm materials.
- Produces steady fluid flow up to 99% pulsation- and vibration-free
- Protects pipes, valves, fittings, meters, and in-line instrumentation from destructive pulsations, cavitation, and water hammer
- Creates steady and continuous flow when dosing, blending, or proportioning additives
- Ensures accuracy, longevity, and repeatability of in-line meters
- Enables uniform application of material in spraying and coating systems
- Reduces product agitation, foaming, splashing, and degradation of products Steel

Calibration Cylinders:
Calibration cylinders verify the flow rate of a Hydra-Cell P Series metering pump, providing a visual indicator that the system is operating within the required parameters of performance and accuracy.

Service Kits:
Convenient replacement part kits for all models of Hydra-Cell pumps are prepackaged with all necessary components to make pump service quick and easy. Three types of kits are available depending on the level of replacement service required:
- Diaphragm Kit
- Valve Kit
- Complete Fluid-end Kit

Every kit has the correct components matching your specific pump configuration and materials (based on your original model number designed in Order Code Digits 7, 8, 9, 10 & 11).
Hydra-Cell® Application Worksheet

Let us help you determine the best solution for your pumping application. Simply provide the information below, tear out the page, and send it to us.

1. Fax to +44 (0) 1252 629242
2. Scan the page and email it as an attachment to sales@wannerint.com
3. Mail the page - either in an envelope or fold it, and using the other side as a mailing label, tape the page closed, affix postage and mail it
4. Give it to your local Wanner distributor

**Contact Information:**

<table>
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**Liquid Information:**

| Liquid Name: | |
| Solids: ✔ No ☐ If Yes, size and percentage: | |
| Liquid Temperature: Operating ____________ Min ____________ Max ____________ | |
| Viscosity: Min ____________ Max ____________ Specific Gravity: | |

Please provide a brief description of the application and liquid characteristics (e.g. abrasive, shear-sensitive)

| Please provide MSDS Sheet if available. |

**Equipment Information:**

| Installation: New ☐ Existing ☐ |
| If existing, previous equipment installed: | |
| Flow Rate: Operating ____________ Min ____________ Max ____________ Units ____________ | |
| Discharge Pressure: ____________ Inlet (Suction) Pressure: ____________ | |
| NPSHa: | |
| Inlet Pipe Diameter: ____________ Inlet Pipe Length: ____________ | |
| Supply Voltage: Phase ____________ Hertz ____________ | |

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Hydra-Cell® Worldwide Sales and Service

Sales and Technical Support

- Wanner Engineering Inc.
- Wanner International Ltd.
- Wanner Pumps Ltd.

Contact us for the distributor location nearest you.

Algeria
Argentina
Australia
Austria
Belarus
Belgium
Brazil
Bulgaria
Canada
China
Colombia

Czech Republic
Denmark
Ecuador
Egypt
Estonia
Finland
France
Germany
Greece
Hong Kong
Hungary

India
Indonesia
Ireland
Israel
Italy
Japan
Kazakhstan
Kuwait
Latvia
Lithuania
Malaysia

Mexico
Morocco
Netherlands
New Zealand
Norway
Oman
Poland
Portugal
Qatar
Puerto Rico
Romania
Hydra-Cell pumps are sold and serviced worldwide by a comprehensive network of factory-trained pump distributors. As specialists in pump technologies, our distributor organizations offer you a vital local resource for technical expertise, product training, sales and service.

Hydra-Cell distributors are located in nearly 70 countries worldwide. In North America specifically, there are more than 100 Hydra-Cell distributor locations to provide local availability for every major commercial, institutional, industrial, and municipal marketplace.

**World Headquarters and Manufacturing**
- Minneapolis, Minnesota, USA

**Business Units**
- Wichita Falls, Texas, USA
- Hampshire, United Kingdom
- Kowloon, Hong Kong
- Shanghai, China
- São Paulo, Brazil

Russia  
Serbia  
Saudi Arabia  
Singapore  
Slovakia  
South Africa  
South Korea  
Spain  
Sweden  
Switzerland  
Taiwan  
Thailand  
Tunisia  
Turkey  
Ukraine  
United Arab Emirates  
United Kingdom  
United States  
Uruguay  
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Viet-Nam  
Yemen