Pump Selection Guide

RESIDENTIAL & COMMERCIAL WATER

LOWARA
a xylem brand
Let’s solve water.

Xylem is focused on helping our customers solve their most challenging water issues: treating water to make it potable, transporting it to where it is needed, using it in the most efficient manner, testing and analyzing its qualities, and cleaning it after its many uses.
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>Domestic Pressure Systems</td>
<td>• Water pressure systems with automatic pump controller</td>
</tr>
<tr>
<td>13</td>
<td>Vertical Inline Pumps</td>
<td>• Inline vertical multistage pump: eSV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Inline close coupled pump: FC</td>
</tr>
<tr>
<td>21</td>
<td>End Suction Centrifugal Pumps</td>
<td>• Horizontal multistage pump: HM/ HMS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stainless steel close coupled end suction pump: CEA-CA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Open impeller close coupled pump: CO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• End suction close coupled pump: FH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stainless steel end suction close coupled pumps: SH / SHO</td>
</tr>
<tr>
<td>33</td>
<td>Circulators</td>
<td>• Wet rotor circulator: TLC - TLCB</td>
</tr>
<tr>
<td>37</td>
<td>Variable Speed Control</td>
<td>• Variable speed system controller: Hydrovar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Universal pump controller and booster system: SD60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pumps with integrated variable speed drive: Teknospeed</td>
</tr>
<tr>
<td>45</td>
<td>Borehole Pumps &amp; Motors</td>
<td>• 4” submersible: MSP, GS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6” submersible: Z6-ZN6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8”, 10”, 12” submersible: Z8-ZR8, Z10-ZR10, Z12-ZR12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4” submersible motors and control boxes: CentriPro CP4C &amp; CT400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 6”, 8”, 10”, 12” submersible motors: CentriPro CP6W, CP8W, CP10W, CP12W</td>
</tr>
<tr>
<td>57</td>
<td>Submersible Pumps for Dewatering and Sewage</td>
<td>• Submersible dewatering: DOC, DIWA &amp; DN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Submersible wastewater: DOMO, GL &amp; DL, G2-V,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Grinder: DOMO GRI, G2-T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multistage centrifugal submersible pump: SCUBA, SGR, SPG</td>
</tr>
<tr>
<td>69</td>
<td>Goulds Water Technology Pumps</td>
<td>• GIS-GISO, HSC-S, Submersible turbine pumps, P &amp; MP</td>
</tr>
<tr>
<td>73</td>
<td>Pressure Tanks</td>
<td>• Pressure Wave, Challenger, C2 Lite</td>
</tr>
<tr>
<td>77</td>
<td>Appendix</td>
<td>• Pump fundamentals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Piping frictional losses</td>
</tr>
</tbody>
</table>
With deep applications expertise in the water industry, Xylem Residential and Commercial Water (RCW) is focused on producing highly efficient water technologies that use less energy, reduce life-cycle costs and provide environmental benefits to users and the communities in which they operate. Through trusted, industry-leading brands, RCW offers a complete range of products, accessories, and systems for use of water in homes, commercial buildings, general industry, agriculture and irrigation.
Renowned innovative hydraulic design.

Lowara is focused on producing high quality, reliable, cost-effective pumping systems, maximizing efficiency in order to satisfy customers’ needs at best. Lowara pumps are made in fabricated stainless steel, which keeps the water from contamination. Laser welding technology creates pumps that are resistant to aggressive chemicals and guarantees the production process respect the natural environment. Lowara enables smarter use of water.
Domestic Pressure Systems
Water pressure systems with automatic pump controller.

Lowara water pressure systems feature new generation all stainless steel pumps manufactured to the highest standards using only the finest quality components and supplied with the toughest, most dependable tanks available.

**Features**
- Advanced design and materials
- Highly corrosion resistant
- Efficient and economical
- Quiet, compact and light
- Easily installed and serviced
- Extended service life

**HM/HMS series.**
- Above ground supply
- HMS liquid end is all 316 stainless steel
- Flows up to 7.2 m³/hr
- Economical and quiet
- Ideal for larger residences

**BGM series.**
- Self priming stainless steel jet pump
- Can be used with above or below ground water supply
- Flows up to 4.2 m³/hr
- Ideal for small to medium size residences

**C series.**
- For above ground water supply
- Flows up to 31 m³/hr
- Suitable for large residences and domestic irrigation

**CentriPro PC automatic pump controller.**

The CentriPro PC controller is a device designed to control pumps in domestic applications. Controlling the operating pressure, it will protect the pump from dry running to ensure your pump operate efficiently for many years.

Lowara HM/HMS & BGM are available with PC pressure controller.
### HM/HMS Performance At Zero Suction

<table>
<thead>
<tr>
<th>Model</th>
<th>kPa psi</th>
<th>Discharge Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2HM3</td>
<td>0.3</td>
<td>68 59 50 40 25 7 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 15 3 0</td>
</tr>
<tr>
<td>2HM4</td>
<td>0.45</td>
<td>72 68 64 56 49 42 34 25 16 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 15 4 12 11 9 8 6 4 0</td>
</tr>
<tr>
<td>2HM5</td>
<td>0.55</td>
<td>73 68 64 60 55 50 44 38 32 25 18 9 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 15 14 13 12 11 10 8 7 6 4 2 0</td>
</tr>
<tr>
<td>2HM7</td>
<td>0.75</td>
<td>72 68 61 58 54 50 45 40 35 30 25 18 12 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 15 14 13 12 11 10 9 8 7 6 4 3 0</td>
</tr>
<tr>
<td>4HM4</td>
<td>0.45</td>
<td>118 92 78 60 40 15 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 20 17 13 9 3 0</td>
</tr>
<tr>
<td>4HM5</td>
<td>0.55</td>
<td>124 115 107 98 88 76 65 52 39 22 7 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 26 24 22 20 17 14 12 9 5 2 0</td>
</tr>
<tr>
<td>4HM7</td>
<td>0.75</td>
<td>130 125 120 114 107 100 94 86 76 68 59 50 38 25 14 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29 28 27 25 24 22 21 19 17 15 13 11 8 6 3 0</td>
</tr>
<tr>
<td>4HM9</td>
<td>0.90</td>
<td>133 130 126 121 117 113 107 102 96 90 84 78 70 62 55 47 38 27 20 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 29 28 27 26 25 24 22 21 20 19 17 16 14 12 10 8 6 4 0</td>
</tr>
<tr>
<td>2HM3</td>
<td>0.3</td>
<td>55 45 32 20 3 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 10 7 4 0 7 0</td>
</tr>
<tr>
<td>2HM4</td>
<td>0.45</td>
<td>62 57 53 47 40 35 27 22 12 5 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 13 12 10 9 8 6 5 3 1 0</td>
</tr>
<tr>
<td>2HM5</td>
<td>0.55</td>
<td>65 62 57 54 50 45 41 36 31 25 20 17 16 6 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 14 13 12 11 10 9 8 7 6 4 3 1 0</td>
</tr>
<tr>
<td>4HM4</td>
<td>0.45</td>
<td>115 102 90 75 60 45 20 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 23 20 17 13 10 4 2 0</td>
</tr>
<tr>
<td>4HM5</td>
<td>0.55</td>
<td>115 110 100 90 78 66 55 40 25 10 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 24 22 20 17 15 12 9 6 2 0</td>
</tr>
<tr>
<td>4HM7</td>
<td>0.75</td>
<td>120 112 105 97 90 80 72 60 50 40 25 12 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27 25 23 22 20 18 16 13 11 9 6 3 0</td>
</tr>
</tbody>
</table>

### BGM Performance at Zero Suction

<table>
<thead>
<tr>
<th>Model</th>
<th>kPa psi</th>
<th>Discharge Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGM 3</td>
<td>0.37</td>
<td>55 46 38 32 26 20 14 10 8 6 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 10 8 7 6 4 3 2 1 0</td>
</tr>
<tr>
<td>BGM 5</td>
<td>0.55</td>
<td>65 60 52 46 40 34 26 20 14 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 13 11 10 9 8 6 4 3 2 0</td>
</tr>
<tr>
<td>BGM 7</td>
<td>0.75</td>
<td>65 56 50 44 38 30 26 20 14 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 12 11 10 8 7 6 4 3 2 0</td>
</tr>
<tr>
<td>BGM 9</td>
<td>0.90</td>
<td>70 65 57 48 42 32 27 20 14 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 14 13 11 9 7 6 4 3 2 0</td>
</tr>
<tr>
<td>BGM 11</td>
<td>1.10</td>
<td>75 70 62 54 46 38 30 22 14 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17 16 14 12 10 8 7 4 3 2 0</td>
</tr>
</tbody>
</table>

### CAM Performance at Zero Suction

<table>
<thead>
<tr>
<th>Model</th>
<th>kPa psi</th>
<th>Discharge Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM 70/33</td>
<td>0.75</td>
<td>80 75 67 65 55 42 32 12 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 17 15 14 12 9 7 3 0</td>
</tr>
<tr>
<td>CAM 70/45</td>
<td>1.10</td>
<td>80 75 72 65 60 50 40 30 17 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 17 16 14 13 11 9 7 4 0</td>
</tr>
<tr>
<td>CAM 120/33</td>
<td>1.10</td>
<td>140 125 115 95 85 65 45 20 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31 28 26 21 19 15 10 4 0</td>
</tr>
<tr>
<td>CAM 120/35</td>
<td>1.50</td>
<td>150 135 125 115 95 80 60 40 10 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33 30 28 26 21 18 13 9 2 0</td>
</tr>
</tbody>
</table>
BGR series with CentriPro MP automatic pump controller.

Applications
- Pressure boosting
- Water transfer
- Lawn and garden irrigation
- Cistern filling

Features

PUMP
Self-priming centrifugal jet pumps for handling clean water in domestic applications. Robust design with pressed stainless steel casing and an aluminium motor body. These pumps are equipped with built-in ejector systems providing suction lift capability. This design arrangement allows the pumps to remain primed if there are gases in the pumped water. All liquid contact components are FDA approved.

Available in 220-240V, 50Hz, Single Phase
Approved for use in drinking water to AS/NZS 4020

CONTROL
Compact and functional device incorporating an electronic circuit, a diaphragm and retaining spring system integrated with delivery and pressure sensors. It is designed to replace traditional pressure switch control systems in domestic use. It offers the advantage of small overall dimensions, no routine maintenance is required and it also provides the pump with adequate protection against dry running.

Available in 200-240V, 50Hz, Single Phase

Options
Also available as bare pumps without MP controller

<table>
<thead>
<tr>
<th>MODEL</th>
<th>POWER</th>
<th>NUMBER OF TAPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGR 050</td>
<td>0.37 kW 0.5 HP</td>
<td>5</td>
</tr>
<tr>
<td>BGR 075</td>
<td>0.55 kW 0.75 HP</td>
<td>7</td>
</tr>
<tr>
<td>BGR 100</td>
<td>0.75 kW 1.0 HP</td>
<td>11</td>
</tr>
</tbody>
</table>
Vertical Inline Pumps
Inline vertical multistage pump.

eSV series.

The new eSV is a technologically advanced pump renowned for excellent performance and leading efficiencies with high reliability. With a wide range of sizes available, it is capable of meeting customer needs for various industries.

Applications
- Ideal for use with the Hydrovar pump mounted system controller. See pages 39-41
- Handling of water, free of suspended solids, in the civil, industrial and agricultural sectors
- Pressure boosting and water supply systems
- Irrigation systems
- Wash systems
- Water treatment plants
- Handling of moderately aggressive liquids, demineralized water, water and glycol, etc
- Circulation of hot and cold water for heating, cooling and conditioning systems
- Boiler feed
- Pharmaceutical industries
- Food & beverage industries

Specifications

PUMP
The SV pump is a non-self priming vertical multistage pump coupled to a standard motor. The liquid end, located between the upper cover and the pump casing, is held in place by tie rods. The pump casing is available with different configurations and connection types.
- Delivery: up to 160 m³/hr
- Head: up to 330m
- Temperature of pumped liquid:
  - from -30°C to +120°C for standard version
- Maximum operating pressure:
  - 1, 3, 5, 10, 15, 22SV with oval flanges: 16 bar (PN16)
  - 1, 3, 5, 10, 15, 22SV with round flanges or Victaulic®, Clamp or DIN 11851 connections: 25 bar (PN 25)
  - 33,46SV: 16, 25, 40 bar (PN16, PN25 or PN40)
  - 66, 92, 125SV: 16 or 25 bar (PN16 or PN25)
- Tested in compliance with ISO 9906 - Annex A
- Direction of rotation: clockwise looking at the pump from the top down (marked with an arrow on the adapter and on the coupling)

MOTOR
- Squirrel cage in short circuit, enclosed construction with external ventilation
- IP55 protection
- Class F insulation
- Performances according to EN 60034-1
- Standard voltage:
  - Single-phase version: 220-240V, 50 Hz
  - Three-phase version: 220-240/380-415V, 380-415/660-690V, 50 Hz for power above 3 kW
- Standard motors comply with MEPS

Options
- Patented i-ALERT monitor continuously measures vibration to support optimum performance
- Optical sensor for detecting the lack of water to prevent damage deriving from dry running. This accessory can be fitted to the filling tapping
- High pressure pump, horizontal version, low NPSH version, high temperature version, passivated and electro-polished version are also available upon request

Materials
- Standard construction: 1SV to 22SV all wetted parts in 304SS; 33SV to 125SV wetted parts in 304SS/316SS/CI
- SVS construction: 33SV to 92SV all wetted parts in 304SS
- SVN construction: all wetted parts in 316SS
- All constructions are suitable for use with potable water to AS/NZS 4020
Features of 1, 3, 5, 10, 15 & 22SV series

- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel
- Reduced axial thrusts enable the use of standard motors that are easily found in the market. The SM ≥ 0.75 kW and PLM surface motors have efficiency values that fall within the range normally referred to as efficiency class IE2
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069 for 1, 3, 5SV and 10, 15, 22SV (≤ 4 kW) series
- Easy maintenance. No special tools required for assembly or disassembly
- With round flanges that can be coupled to counter-flanges, according to EN 1092

Options

- The following versions are available:
  - F: round flanges, in-line delivery and suction ports, AISI 304
  - T: oval flanges, in-line delivery and suction ports, AISI 304
  - R: round flanges, delivery port above the suction port, with four adjustable positions, AISI 304
  - N: round flanges, in-line delivery and suction ports, AISI 316
  - V: Victaulic® couplings, in-line delivery and suction ports, AISI 316
  - C: Clamp couplings (DIN 32676), in-line delivery and suction ports, AISI 316
  - K: threaded couplings, (DIN 11851), in-line delivery and suction ports, AISI 316
- Balanced mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069, which can be replaced without removing the motor from the pump
- A second plug is available for 10, 15, 22SV series
- Threaded, oval counter-flanges made of stainless steel are standard supply for the T versions
- Round counter-flanges made of stainless steel are available on request for the F, R and N versions

Features of 33, 46, 66, 92 & 125SV series

- Version G: vertical multistage centrifugal pump with impellers, diffusers and outer sleeve made entirely of stainless steel, and with pump casing and motor adaptor made of cast iron
- Innovative axial load compensation system on pumps with higher head. This ensures reduced axial thrusts and enables the use of standard motors that are easily found in the market
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal
- The pumps for G, N versions are certified for drinking water use (WRAS and ACS certified)
- Standard version for temperatures ranging from -30°C to +120°C
- Pump body fitted with couplings for installing pressure gauges on both suction and delivery flanges
- In-line ports with round flanges that can be coupled to counter-flanges, in compliance with EN 1092
- Mechanical sturdiness and easy maintenance. No special tools required for assembly or disassembly

Options

- Balanced mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069, which can be replaced without removing the motor from the pump
- N, P: version made entirely of AISI 316 stainless steel
PERFORMANCE CURVES AT 2900 RPM

1SV : 2-15 stages

1SV : 17-37 stages

3SV

5SV

10SV

15SV
PERFORMANCE CURVES AT 2900 RPM

22SV

33SV

46SV

66SV

92SV

125SV
Inline close coupled pump.

**FC series.**

Reliable high performance pump with casing in high resistance cast iron and high strength impeller in laser welded 316L stainless steel.

**Applications**

- Ideal for use with the Hydrovar pump mounted system controller. See pages 39-41
- Water supply
- Pressure boosting
- Tank filling
- Water transfer
- Wash down
- Irrigation

**Specifications**

- Flows to 190 m³/hr
- Heads to 89 m
- Power up to 22 kW
- Mechanical seal in accordance with DIN 24960
- Liquid temperature limits: -10°C to 130°C (E versions), -20°C to 140°C (S versions)
- Maximum operating pressure: 12 bar, PN12 (E versions), PN16 (S versions)
- IP55 TEFC motor standard
- Standard three phase voltage up to 3kW 380-415V 4kW and over 380-415/600V

**Features**

- Top pull out design
- AISI 316L replaceable wear rings fitted to impeller as standard
- Impeller: AISI 316L stainless steel laser welded technology for sizes up to 80-160. All other sizes in cast iron class 25B
- Four pole versions available
- Flanges in compliance with DIN 2532
- Counter flanges available
- Seal chamber air vent standard
- FCE - Extended shaft
- FCS - Stub shaft (subject to availability)

**MATERIAL TABLE**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump body</td>
<td>CAST IRON CLASS 25B</td>
</tr>
<tr>
<td>Impeller</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Seal housing</td>
<td>CAST IRON CLASS 25B</td>
</tr>
<tr>
<td>Adaptor</td>
<td>ALUMINUM/CAST IRON</td>
</tr>
<tr>
<td></td>
<td>CASTIRON CLASS 25B</td>
</tr>
<tr>
<td>Mechanical seal</td>
<td>CERAMIC/CARBON/EPDM</td>
</tr>
<tr>
<td>O-ring</td>
<td>EPDM</td>
</tr>
<tr>
<td>Wear ring</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Counterwear ring</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Shaft</td>
<td>AISI 316</td>
</tr>
<tr>
<td>Base</td>
<td>ALUMINUM</td>
</tr>
<tr>
<td>Fill / drain plug</td>
<td>NICKEL PLATED BRASS</td>
</tr>
</tbody>
</table>

**IDENTIFICATION CODES**

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCE</td>
<td>Reduced Impeller</td>
<td>6 = 60 Hz</td>
</tr>
<tr>
<td>A</td>
<td>Rated motor power (kW x 10)</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Impeller nominal diameter (mm)</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>Discharge port nominal diameter (mm)</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>4 = 4-pole motor</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Series name</td>
<td></td>
</tr>
</tbody>
</table>
These family curves are for reference only. Final selection should be made from individual performance charts.
End Suction Centrifugal Pumps
Horizontal multistage pump.

HM/HMS series.
General purpose, multistage pumps particularly suitable for domestic and industrial service with clean liquids.

Applications
- Water supply
- Water circulation and transfer
- Irrigation
- Pressure boosting

Specifications
- Flows up to 130 l/min
- Heads up to 60m
- Power up to 0.9kW
- Maximum liquid temperature
  - HMS 110°C/ HM 60°C
- Maximum working pressure 8 bar
- IP55 TEFC motor standard
- Class F insulation
- Voltages
  - Single phase: 220 - 240V / 50Hz
  - Three phase: 380 - 415V / 50 Hz
- Continuously rated

Features
- Back pull out design
- HMS Series liquid-end in all AISI 316L stainless steel construction
- HMS Series can be used with moderately aggressive liquids
- HM Series impellers in high efficiency not food-grade high impact thermoplastic
- Quiet operation
- Approved for use in drinking water to AS/NZS 4020
Stainless steel close coupled end suction pump.

**CEA-CA series.**

General purpose, single impeller (CEA) and dual impeller (CA) pumps suitable for domestic and industrial service.

**Applications**
- Transfer of water and clean moderately aggressive fluids
- Water supply
- Water circulation
- Pressure boosting
- Irrigation
- Dairy services
- Vat wash

**Specifications**
- Flows to 31 m³/hr
- Heads to 62m
- Power up to 3 kW
- Maximum liquid temperature
  - Standard 85°C (CEA-CA)
  - Optional 110°C (CEA V, CA-V)
- Maximum working pressure 8 bar, PN8
- IP55 TEFC motor standard
- Class F insulation
- Voltages
  - Single phase: 220 - 240V / 50Hz
  - Three phase: 380 - 415V / 50Hz
- Continuously rated

**Features**
- Back pull out design
- Liquid-end in all stainless steel construction
- Single and twin impeller versions available

**Options**
- Special ‘N’ versions available with wet end 316SS construction
- “V” available with all elastomers in FPM

---

**MATERIAL TABLE**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump body, flange, back plate, diffuser</td>
<td>STAINLESS STEEL (AISI 304 - DIN 1.4301)</td>
</tr>
<tr>
<td>Impeller</td>
<td>STAINLESS STEEL (AISI 304 - DIN 1.4301)</td>
</tr>
<tr>
<td>Shaft extension</td>
<td>STAINLESS STEEL (AISI 304 - DIN 1.4301)</td>
</tr>
<tr>
<td>Filling and drain plugs</td>
<td>STAINLESS STEEL (AISI 304 - DIN 1.4301)</td>
</tr>
<tr>
<td>Mechanical seal</td>
<td>CARBON/CERAMIC</td>
</tr>
<tr>
<td>O-rings</td>
<td>NBR</td>
</tr>
</tbody>
</table>
SINGLE IMPELLER VERSION - PERFORMANCE CURVES AT 2850 RPM

MOTOR POWER - SINGLE IMPELLER

<table>
<thead>
<tr>
<th>Phase</th>
<th>CEA 70/3</th>
<th>CEA 70/5</th>
<th>CEA 80/5</th>
<th>CEA 120/3</th>
<th>CEA 120/5</th>
<th>CEA 210/2</th>
<th>CEA 210/3</th>
<th>CEA 210/4</th>
<th>CEA 210/5</th>
<th>CEA 370/1</th>
<th>CEA 370/2</th>
<th>CEA 370/3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Phase</td>
<td>0.37</td>
<td>0.55</td>
<td>0.75</td>
<td>0.55</td>
<td>0.9</td>
<td>0.75</td>
<td>1.1</td>
<td>1.5</td>
<td>2.2</td>
<td>1.0</td>
<td>1.5</td>
<td>1.85</td>
</tr>
<tr>
<td>Three Phase</td>
<td>0.37</td>
<td>0.55</td>
<td>0.75</td>
<td>0.55</td>
<td>0.9</td>
<td>0.75</td>
<td>1.1</td>
<td>1.5</td>
<td>1.85</td>
<td>1.0</td>
<td>1.5</td>
<td>1.85</td>
</tr>
</tbody>
</table>
TWIN IMPELLER VERSION - PERFORMANCE CURVES AT 2850 RPM

MOTOR POWER - TWIN IMPELLER

<table>
<thead>
<tr>
<th>Single Phase</th>
<th>CAM 70/33</th>
<th>CAM 70/34</th>
<th>CAM 70/45</th>
<th>CAM 120/33</th>
<th>CAM 120/35</th>
<th>CAM 120/55</th>
<th>CAM 200/33</th>
</tr>
</thead>
<tbody>
<tr>
<td>kW</td>
<td>0.75</td>
<td>0.9</td>
<td>1.1</td>
<td>1.1</td>
<td>1.5</td>
<td>2.2</td>
<td>1.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Three Phase</th>
<th>CA 70/33</th>
<th>CA 70/34</th>
<th>CA 70/45</th>
<th>CA 120/33</th>
<th>CA 120/35</th>
<th>CA 120/55</th>
<th>CA 200/33</th>
<th>CA 200/35</th>
</tr>
</thead>
<tbody>
<tr>
<td>kW</td>
<td>0.75</td>
<td>0.9</td>
<td>1.1</td>
<td>1.1</td>
<td>1.5</td>
<td>2.2</td>
<td>1.85</td>
<td>2.2</td>
</tr>
</tbody>
</table>
Open impeller close coupled pump.

CO series.
General purpose, open impeller pumps particularly suitable for industrial service with moderately aggressive liquids containing suspended solids.

Applications
- Metal washing and surface treatment
- Produce washing in the packaging industry
- Washing equipment for the food industry
- Textile industry
- Industrial washing machines
- Commercial dishwashers

Specifications
- Flows to 54 m³/hr
- Heads to 24m
- Power up to 3 kW
- Maximum liquid temperature -10°C to 120°C
- Maximum solid sizes: CO350 11mm, CO500 20mm
- Maximum working pressure 8 bar, PN8
- IP55 TEFC class F motor as standard
- Voltages
  - Single phase: 220 - 240V / 50Hz
  - Three phase: 380 - 415V / 50Hz

Features
- All pump parts in contact with fluid made of AISI 316L stainless steel
- Threaded connections to pipe work, pump having an open impeller design for increased wear capabilities
- Special seal options available
- Also available as COF version, frame mount for 2 and 4 pole applications
- Additional open impeller design pumps, see SHO series on page 24

MATERIAL TABLE

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump casing, mechanical seal housing and impeller</td>
<td>STAINLESS STEEL (AISI 316L - DIN 1.4404)</td>
</tr>
<tr>
<td>Shaft</td>
<td>STAINLESS STEEL (AISI 316L - DIN 1.4404)</td>
</tr>
<tr>
<td>Filler and discharge plugs</td>
<td>STAINLESS STEEL (AISI 316L - DIN 1.4404)</td>
</tr>
<tr>
<td>Mechanical Seal (standard)</td>
<td>CERAMIC/CARBON</td>
</tr>
<tr>
<td>Mechanical Seal (option)</td>
<td>SIL CARB./TUNG CARB</td>
</tr>
<tr>
<td>Elastomers</td>
<td>FPM</td>
</tr>
</tbody>
</table>
End suction close coupled pump.

**FH series.**

Reliable high performance pump with casing in high resistance cast iron and high strength impeller in laser welded 316L stainless steel.

**Applications**

- Ideal for use with the Hydrovar pump mounted system controller. See pages 39-41
- Water supply
- Pressure boosting
- Tank filling
- Water transfer
- Wash down
- Irrigation

**Specifications**

- Flows to 700 m³/hr
- Heads up 95m
- Complies with EN733 / DIN 24255
- Mechanical seal in accordance with DIN 24960
- Liquid temperature limits
  - Standard: -10˚C to 85˚C
  - Optional: -20˚C to 120˚C
- Maximum operating pressure 12 bar, PN12
- Single phase 220-240 V available up to 2.2kW
- IP55 TEFC Motor Standard

**Features**

- Back pull out design
- AISI 316L replaceable wear rings fitted to impeller as standard
- Impeller: AISI 316L stainless steel laser welded technology for sizes 32, 40, 50, 65-125. All other sizes in cast iron class 25B
- Four pole versions available
- Flanges in compliance with DIN 2532
- Counter flanges available

**Design Configuration**

- FHE - Extended shaft
- FHS - Stub shaft (subject to availability)
- FHF - Frame mounted (subject to availability)
- Elastomers in component and NBR in material

**MATERIAL TABLE**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump body</td>
<td>CAST IRON CLASS 25B</td>
</tr>
<tr>
<td>Impeller 32, 40, 50, 65-125</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Impeller 65-80</td>
<td>CAST IRON CLASS 25B</td>
</tr>
<tr>
<td>Seal housing</td>
<td>CAST IRON CLASS 25B</td>
</tr>
<tr>
<td>Adaptor</td>
<td>ALUMINIUM OR CAST IRON</td>
</tr>
<tr>
<td>Mechanical seal</td>
<td>CERAMIC/CARBON/NITRILE</td>
</tr>
<tr>
<td>Wear ring</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Fill/drain plug</td>
<td>NICKEL PLATED BRASS</td>
</tr>
</tbody>
</table>

**IDENTIFICATION CODES**

- FH = Extended Shaft
- E = 4-pole motor
- 6 = 60 Hz
- Reduced impeller
- Rated motor power (kW x 10)
- Impeller nominal diameter (mm)
- Discharge port nominal diameter (mm)
- H series name

---

LOWARA
PERFORMANCES CURVES AT 2900 RPM FH SERIES

These family curves are for reference only. Final selection should be made from individual performance charts.
Stainless steel end suction close coupled pumps.

**SH series.**

A pump designed to handle hot, cold and moderately aggressive fluids with high strength, efficiency and reliability through the extensive use of laser welding technology.

**Applications**
- Water supply and pressure boosting
- Transfer of moderately aggressive fluids for industrial processes
- Hot and cold water circulation for heating, ventilation and air conditioning systems
- Ideal for use with the Hydrovar pump mounted system controller. See page 39-41

**Specifications**
- Flows to 240 m³/hr
- Heads to 110m
- Liquid temperature limitations
  Standard - 10°C to 120°C
- Maximum operation pressure 12 bar, PN12
- IP55 TEFC Class F motor as standard
- Standard voltage 380-415 V / 50 Hz

**Features & Options**
- All pump parts in contact with fluid made of AISI 316L stainless steel
- Closed impeller design in either AISI 316L laser welded or cast CF8M construction
- Complies with EN 733, ex DIN 24255 and UNI-EN 1092-1
- Back pull out design for ease of service

**Design Configuration Options**
- SHE - Extended motor shaft
- SHS - Stub shaft
- SHF - Frame mounted
- Four pole and special seal options available

**SHO series.**

Open impeller version of the SH pump to handle fluids with small suspended particles or solids. Impeller in cast CF8M stainless steel, capable of passing solids of 20mm to 40mm depending upon model.
- Flows to 56 m³/hr
- Heads to 50m

**Design Configuration Options**
- SHOE - Extended motor shaft
- SHOS - Stub shaft
- SHOD - Double seal arrangement

**MATERIAL TABLE**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump body</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Impeller</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Seal housing</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Wear rings</td>
<td>AISI 316 L</td>
</tr>
<tr>
<td>Adaptor</td>
<td>ALUMINIUM OR CAST IRON CLASS 25 B</td>
</tr>
<tr>
<td>Mechanical Seal</td>
<td>CERAMIC/CARBON/FFM</td>
</tr>
<tr>
<td>O-ring</td>
<td>FPM</td>
</tr>
<tr>
<td>Fill drain plugs</td>
<td>STAINLESS STEEL</td>
</tr>
<tr>
<td>Shaft</td>
<td>AISI 316</td>
</tr>
</tbody>
</table>
The declared NPSH values are laboratory values: for practical use we suggest increasing these values by 0.5m.
The declared performances and power are valid for liquids with density $p = 1.0 \text{kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{mm}^2/\text{sec.}$

These family curves are for reference only. Final selection should be made from individual performance charts.
Circulators
Wet rotor circulator.

TLC-TLCB series.
Threaded wet rotor circulators for residential, light commercial heating and air conditioning systems.

Features
- Reduced noise level thanks to shaft and bearings made of ceramic
- Three speed with manual adjustment to optimise system performance
- ‘H’ version for high flow applications
- ‘B’ version is with bronze pump body
- The pump is easily bled by simply opening the venting screw located in the center of the top cover

<table>
<thead>
<tr>
<th>Model</th>
<th>Flows</th>
<th>Heads</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLC-TLCH</td>
<td>3m³/hr</td>
<td>7m/hr</td>
</tr>
<tr>
<td>TLCH</td>
<td>12m³/hr</td>
<td>12m/hr</td>
</tr>
<tr>
<td>TLCB-TLCHB</td>
<td>4m³/hr</td>
<td>7m/hr</td>
</tr>
<tr>
<td>TLCHB</td>
<td>12m³/hr</td>
<td>12m/hr</td>
</tr>
</tbody>
</table>
- Refer to Lowara technical catalogues for H series performances

Specifications
- Port to port dimensions of: 130 / 150 / 180mm
- Single connection with threaded discharge ports of 1”, 1¼”, 1½”, 2”
- Temperature of pumped fluid: +2°C to +110°C
- Insulation: Class H
- Protection: IP44
- Max Operating Pressure: 10 bar
- Voltage: 230V / 50Hz

Options
- Insulation shell
- Pipe / Barrel Unions
Performance Curves for TLC Series at 2900RPM
Variable Speed Control
Variable speed system controller.

Hydrovar.

Hydrovar is a pump mounted variable speed, microprocessor based system controller, and was the world’s first of its type to manage motor speed and hence match the pumps performance in numerous water applications. It is fully programmable on site and due to its unique modular design it can be mounted directly on centrifugal pumps with standard IEC motors. Available in Master, Single or Basic variants, ensuring the correct solution for your application.

Applications

• Constant pressure water supply for residential, civil and commercial buildings
• Constant pressure boosting and transfer for irrigation and turf water systems
• Constant temperature for heating & cooling applications
• Control of tank or reservoir levels with input from probes or level transducer
• Flow control for when a constant flow rate is required against varying system pressures
• Wall mounted options to control submersible or remote pump applications

Specifications & Features

• Master Hydrovar - all inclusive for single or multipump applications
• Single Hydrovar - for single pump applications only
• Basic Hydrovar - for single or multipump slave applications
• Power 1.1kW to 22kW pump mounted, for higher kW use HYDROVAR SMART
• Single phase 1.1kW to 2.2kW / Three phase 2.2kW - 22kW
• Temperature limitations; 1˚C to 40˚C, de-ratable to 50˚C
• IP55 enclosures as standard
• Standard ModBus Protocol for easy integration into BMS systems
• Inbuilt sensing monitors for under and over voltage, overload, drive and motor over temperature, no flow and transducer failure
• Real time clock for error logging
• Full status menu for easy diagnostics
• Simple menu structure for easy commissioning or adjustment

Energy Savings

Varying the speed of a pump ensures maximum efficiency and when the demand is low, you only consume the power that is required for the duty at hand. In multiple pump applications, only the number of pumps required to deliver the duty will ever run at the most efficient speed. This contributes to significant reductions in energy usage. Additionally when using multiple Hydrovars, due to the “soft start” nature of the technology and optimized speeds, the mechanical stresses are lowered thus giving additional savings in servicing costs. Both of these savings contribute to substantial reduction in Life Cycle Costs.

Retro Fitting

Hydrovar can be directly mounted onto virtually any model centrifugal pump motor, or wall mounted to control the motor remotely as for use in submersible pump applications. Thus an existing pump or pumping system can easily be converted to benefit from having Hydrovar control.
Hydrovar system.

Benefits of using Hydrovar
- Maximize system performance
- Reduce energy consumption
- Reduce starting currents
- Eliminate bypass lines, pressure control and metering valves
- Eliminate pressure pulsation and water hammer
- Increase reliability and service life
- Space saving
- Built-in friction-loss compensation

1. Constant Pressure (figure 1)
In this mode, the Hydrovar varies the pump speed as demand increases or decreases to maintain your required setpoint. In order to set the Hydrovar for this application, the pump should be selected so that the maximum pressure and flow required by the system is on or below the full speed performance curve of the pump (usually 2950 RPM).

2. Multi-pump Applications (figure 2)
- Full VFD System
Up to 8 Hydrovar Master controlled pumps can be operated together in parallel. No other control panels are necessary. The Hydrovar units are wired together through their RS485 interfaces. The microprocessors monitor the activity in each Hydrovar and pump to adjust the overall system performance. Auto changeover of lead pump is possible to ensure even wear throughout the system. This system offers full multiple redundancy.

- Master / Basic VFD System
A combination of Master and Basic Hydrovars can also be used to create a system. A total of 8 drives can be coupled in any configuration with the lead drive being a Master drive. The microprocessor of the lead Master Hydrovar will control the switching on/off, the speed of the Basic Hydrovars, and the rotation of lead pumps. No other control panels are necessary. The Hydrovar units are wired together through their RS485 interfaces.

- Partial VFD System
A relay card can be added to a Master Hydrovar which allows the control of an additional 5 fixed speed pumps. The Master drive will control the switching on/off of the fixed speed pumps. An ancillary control panel will be required to house the switch-gear for each pump.
3. Compensation for system losses (figure 3)
The Hydrovar can increase the discharge pressure of the pump as the flow increases to compensate for the added friction losses in the system. This allows the pumps to “follow the system curve”. To do this, the operator enters the percentage increase in discharge pressure required at the maximum speed and flow. In addition, the operator selects the speed at which this increased pressure will start. The pump should be selected so that the maximum flow is on or below the pump curve. An alternative method is to use a differential pressure transducer on a circulator suction and discharge. The Hydrovar will automatically compensate for system pressure drops.

4. Constant flow (figure 4)
This method allows the operator to set a required flow in either circulator or process applications. The actual flow value can be measured either by means of a flow sensor or by using an orifice plate in combination with a differential pressure transducer. As demand changes the Hydrovar increases pressure to maintain flow. The pump should be selected so that the flow required is near to the maximum efficiency point of the pump and the maximum pressure required is within the scope of the pump performance at full speed.

5. Hydrovar operated in Actuator mode (figure 5)
In actuator mode the Hydrovar will vary pump speed in accordance to a 4 to 20 milliamp external source. In this case the built in controller system is not utilised. Other control methods such as constant level & constant temperature control are also possible.
Universal pump controller & booster system.

**SD60 series.**

Designed to control up to 6 VFD driven pumps on one standard control module, SD60 provides flexibility and eliminates the need for extra control panels or circuitry for variable speed systems. SD60 is a cost-effective addition to system designs and is ideal for high level installations that require safety, reliability, and optimum performance.

**Application**
- Water supply applications
- Irrigation systems

**Specifications & Features**
- Pumps can be sequenced based on flow, temperature, level or pressure. Pumps are approximately timed to avoid water hammer
- Intuitive OLED interface with graphic display, PID logic controller, and cap-sense key pads back lit for easy reading. Guided start-up menus with touch-sensitive screen for easy programming and avoids wear-and-tear over time. Operators can obtain, at any given time, a summary of the status of the system and decide what maintenance is required
- Multi-language support
- Cyclical exchange of starting of the variable-speed pumps and of the fixed-speed pumps for uniform wear of all the installed pumps
- Equipped as standard with 2 optoinsulated serial interfaces, for connection with the most widespread BMS supervision and control systems or with applications developed by third parties. Standard communication protocols are ModBus RTU and CAN. Interface with BacNet™, Johnson Metasys®, TCP/IP, LonWorks®, and Trend is also possible by means of optional external modules, available on request
- Energy consumption can be controlled through a distribution network analyzer (kWh, offered as an option) linked with the SD60 as an external module
- Cascade and speed control
Pumps with integrated variable speed drive.

Teknospeed series.
The Teknospeed is a range of variable speed electric pumps and booster units for constant pressure applications having inbuilt frequency drives.

Applications
- Household and commercial water supply
- Heating and washing systems
- Irrigation and turf
- Fountains

Specifications
- Delivery up to 10 m³/hr
- Heads up to 75m
- Single phase
- Motor ratings of 0.37kW to 1.1kW
- Maximum liquid temperature 40°C

Features
- Variable speed operation assures constant pressure at outlets
- Energy saving with frequency converter controlling power use
- Low maintenance, extended pump life
- Easy to install and silent running
- Protection against dry running available
- Twin pump units for higher flow applications
- Teknospeed also available on C and BG Series pumps
Borehole
Pumps & Motors
4” submersible borehole pump.

**MSP series.**

The MSP Series is the cost effective option that is designed to meet performance requirements in the most demanding applications. Compact, sturdy and designed to be extremely reliable.

**Applications**

- Water supply
- Irrigation systems
- Pressure boosting
- Stock watering
- Mine dewatering

**Specifications**

**PUMP**

- Delivery up to 21 m³/hr
- Head up to 340m
- Maximum diameter for complete pump/motor (cable cover included): 99mm
- Maximum sand handling 150gm/m³
- 1MSP - 2MSP - 4MSP - 6MSP versions 1¼” delivery outlet
- 8MSP - 12MSP - 16MSP versions 2” delivery outlet
- Motor power from 0.25 to 7.5 kW
- Water temperature 0˚C to +35˚C

**MOTOR**

- Single-phase version: 230-240V, 50 Hz 2 poles (2850 RPM) from 0.25 to 2.2 kW
- Three-phase version: 380-415V, 50 Hz 2 poles (2850 RPM) from 0.37 to 7.5 kW

**Features**

**PUMP**

- Abrasion resistant construction. The front wear plate, combined with the floating impeller, ensures optimum resistance to abrasion
- A non-return valve is fitted in the discharge to ensure no back flow or water hammer to the pump, thus safeguarding impellers, diffusers and motor
- The upper and lower supports are made of precision cast lead free bronze material for strength and durability

---

**MATERIAL TABLE**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleeve, cable cover and grid</td>
<td>(AISI 304) STAINLESS STEEL</td>
</tr>
<tr>
<td>Shaft, diffuser casing joint</td>
<td>(AISI 304) STAINLESS STEEL</td>
</tr>
<tr>
<td>Upper bracket &amp; lower bracket</td>
<td>PRECISION LEAD FREE BRONZE</td>
</tr>
<tr>
<td>Impeller and diffuser</td>
<td>TECHNOPOLYMER</td>
</tr>
<tr>
<td>Upper bearing</td>
<td>POLYURETHANE</td>
</tr>
<tr>
<td>Valve packing</td>
<td>NITRILE RUBBER</td>
</tr>
</tbody>
</table>

**MSP SERIES MOTOR SELECTION CHART**

<table>
<thead>
<tr>
<th>Series</th>
<th>Model</th>
<th>Motor Size kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>0.37</td>
<td>0.55</td>
</tr>
<tr>
<td>1MSP</td>
<td>02</td>
<td>03</td>
</tr>
<tr>
<td>2MSP</td>
<td>02</td>
<td>03</td>
</tr>
<tr>
<td>4MSP</td>
<td>03</td>
<td>05</td>
</tr>
<tr>
<td>6MSP</td>
<td>05</td>
<td>07</td>
</tr>
<tr>
<td>8MSP</td>
<td>07</td>
<td>11</td>
</tr>
<tr>
<td>12MSP</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>16MSP</td>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>

**PERFORMANCE CURVES AT 2900 RPM**

---

1MSP
PERFORMANCE CURVES AT 2900 RPM

2MSP

4MSP

6MSP

8MSP

12MSP

16MSP
**GS series.**

The GS Series pumps are a new concept in bore hole pumps. Compact and almost maintenance-free, they are designed to be extremely reliable. They are resistant to oxidation since all the metal parts are in stainless steel. Motor supports and pump discharge are made from precision cast stainless steel.

**Applications**

- Water supply
- Pressure boosting
- Mine dewatering
- Irrigation systems
- Stock watering

**Specifications**

**PUMP**

- Delivery up to 21 m³/hr
- Head up to 340m
- Maximum diameter for complete pump/motor (cable cover included): 99mm
- Maximum sand handling 150gm/m³
- 1GS - 2GS - 4GS - 6GS versions 1¼” delivery outlet
- 8GS - 12GS - 16GS versions 2” delivery outlet
- Motor power from 0.25 to 7.5 kW
- Water temperature 0˚C to +35˚C

**MOTOR**

- Single-phase version: 230-240V, 50 Hz, 2 poles (2850 RPM) from 0.25 to 2.2 kW
- Three-phase version: 380-415V, 50 Hz, 2 poles (2850 RPM) from 0.37 to 7.5 kW

**Features**

**PUMP**

- Abrasion resistant construction. The front wear plate, combined with the floating impeller, ensures optimum resistance to abrasion
- A non-return valve is fitted in the discharge to ensure no back flow or water hammer to the pump, thus safeguarding impellers, diffusers and motor
- The upper and lower supports are made of precision-cast stainless steel, ensuring resistance to corrosion, durability and sturdy coupling to the motor

**MATERIAL TABLE**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleeve, cable cover and grid</td>
<td>(AISI 304) STAINLESS STEEL</td>
</tr>
<tr>
<td>Shaft, diffuser casing joint</td>
<td>(AISI 304) STAINLESS STEEL</td>
</tr>
<tr>
<td>Upper bracket and lower bracket</td>
<td>(AISI 303) STAINLESS STEEL</td>
</tr>
<tr>
<td>Impeller and diffuser</td>
<td>PRECISION CASTING</td>
</tr>
<tr>
<td>Upper bearing</td>
<td>POLYURETHANE</td>
</tr>
<tr>
<td>Valve packing</td>
<td>NITRILE RUBBER</td>
</tr>
</tbody>
</table>

**PERFORMANCE CURVES AT 2900 RPM**

**GS SERIES MOTOR SELECTION CHART**

<table>
<thead>
<tr>
<th>Series</th>
<th>Motor Size kW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.25</td>
</tr>
<tr>
<td>1GS</td>
<td>02</td>
</tr>
<tr>
<td>2GS</td>
<td>02</td>
</tr>
<tr>
<td>4GS</td>
<td>03</td>
</tr>
<tr>
<td>6GS</td>
<td></td>
</tr>
<tr>
<td>8GS</td>
<td></td>
</tr>
<tr>
<td>12GS</td>
<td></td>
</tr>
<tr>
<td>16GS</td>
<td></td>
</tr>
</tbody>
</table>
PERFORMANCE CURVES AT 2900 RPM

2GS

4GS

6GS

8GS

12GS

16GS
6” submersible borehole pump.

**Z6-ZN6 series.**
Durable and lightweight multistage centrifugal submersible pumps for clean water bore hole pumping. Available as standard in 304SS or as ZN in 316SS construction with low maintenance and high efficiency design.

**Applications**
- Water supply
- Irrigation systems
- Pressure boosting
- Mine dewatering

**Specifications**

**PUMP**
- Delivery up to 78 m³/hr
- Head up to 700m
- Maximum overall diameter (cable cover included)
  - 144mm standard version
  - 195mm high pressure version
- Maximum solids 100gm/m³
- Delivery outlet:
  - 2½” for Z612 - Z616 - Z622 series
  - 3” for Z631 - Z646 - Z660 series
- Water temperature 0˚C to +60˚C

**MOTOR**
- 4",6",8" NEMA motor mounting options on certain sizes
- Power requirements from 0.55kW to 55kW
- Water temperature limited to motor
- Available in all either standard, 316SS or duplex construction

**Features**
- Sturdy and lightweight, easy to disassemble and corrosion-resistant
- Impellers and diffusers are made of stainless steel
- Stainless steel supports
- Stainless steel non-return valve
- Upper bearing of tungsten carbid
- Shaft bearings of special polyurethane
- Elastomers EPDM
- Available in all 316SS construction
PERFORMANCE CURVES AT 2900 RPM

For ease of display, only the first grouping of performance stages shown. Refer to the comprehensive Z Series catalogue for higher stage performance curves.

<table>
<thead>
<tr>
<th>Model</th>
<th>Max Stages / Max Head</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z612</td>
<td>60 / 690m</td>
</tr>
<tr>
<td>Z616</td>
<td>56 / 700m</td>
</tr>
<tr>
<td>Z622</td>
<td>50 / 674m</td>
</tr>
<tr>
<td>Z631</td>
<td>43 / 628m</td>
</tr>
<tr>
<td>Z646</td>
<td>37 / 437m</td>
</tr>
<tr>
<td>Z660</td>
<td>32 / 380m</td>
</tr>
</tbody>
</table>
8”, 10” & 12” submersible borehole pump.

Z8-ZR8, Z10-ZR10, Z12-ZR12 series.

This series of robust and light weight submersible pumps are highly efficient and designed for ease of servicing. Optimized hydraulic design with high quality castings. Standard manufacture in cast 304 Stainless Steel equivalent to assist operation in corrosive environments. Available also in “R” as cast Duplex Stainless Steel for more corrosive applications.

Applications
- Water supply from deep bores, rivers and reservoirs
- Pressure boosting and water distribution in civil and commercial systems
- Firefighting and washing systems
- Dewatering and water level control
- Irrigation for crop and turf

Specifications
- Flows: Z8 180m³/hr, Z10 350m³/hr, Z12 520m³/hr
- Heads: Z8 to 550m, Z10 to 545m, Z12 to 450m
- Motor fitting to 6” & 8” NEMA, and 10” & 12” with keyed shaft
- Pump Max OD:
  - Z8 one cable guard; 198mm, with two cable guards; 204mm
  - Z10 with one cable guard; 255mm, with two cable guards; 271mm
  - Z12 with one cable guard; 290mm, with two cable guards; 302mm
- Pump Discharges: Z8 of 5”, Z10 of 6”, Z12 of 8”
- Max permissible suspended solids of 50gm/m³, up to 100g/m³ if wear tolerated

Features
- High efficiency of hydraulics to ensure minimum energy use
- New “dynamic” wear ring reduces hydraulic losses to a minimum, keeps the high efficiency characteristics over time and the pump from blocking during stand-by periods
- Guide bearings on all the stages ensure resistance to wear and guarantee constantly reliable hydraulics
- In built Non-Return Check Valve with integrated spring for positive return
- Impeller and diffusers made of stainless steel
- Delivery casing made of stainless steel
- Suction support and shaft made of stainless steel
- Suitable for horizontal operation
4” submersible motors & control boxes.

Submersible motors suitable for use within boreholes, wells and applications when combined with centrifugal pumps that have 4” NEMA shaft and coupling dimensions. Single phase option as available in either 2-Wire or 3-Wire to 1.1kW, 3-Wire to 4kW, 3-Phase to 7.5kW

CentriPro CP4C series.

2-WIRE MODEL
- Single Phase from 0.37kW to 1.1kW
- NEMA standard flange and shaft dimensions
- Protection Class IP68
- Class F insulation
- Voltage 230V/50Hz +5%-10%
- Maximum submergence 300 meters

Features
- Canned stator design with unique gas filled windings
- Internally rotor and bearings cooled and lubricated in water bath
- PSC design with replaceable lead and stating capacitor housing
- 304SS motor body

CentriPro CT400 series.

3-WIRE AND 3-PHASE MODELS
- Single Phase from 0.37kW to 4.0kW
- Three Phase 0.37kW to 7.5kW
- NEMA standard flange and shaft dimensions.
- Protection Class IP68
- Class B insulation
- Voltages 230V/50Hz +5%-10%, 415V/50Hz +5%-10%
- Maximum submergence 300 meters

Features
- Internally stator, rotor and bearings cooled and lubricated in FDA approved oil bath
- Single phase is PSC design with stating capacitor within the matching control box, see next “CPC/S”
- 304SS motor body and fittings with forged brass upper support and 431SS shaft
Motor Control Boxes.
Designed specifically for the CentriPro CT400 single phase motors in two versions.

**CPC/S SERIES:**
Suitable for the 0.37kW to 2.2kW motors

**CPC/L SERIES:**
Suitable for the 3kW and 4kW motors

**Features**
- Manual On/Off switch incorporating thermal overload in CPC/S
- Lightning arrester included in both versions
- 230-240V/50Hz +/- 10%
- IP56 sturdy thermoplastic enclosures
Robust submersible motors suitable for use within boreholes, wells and applications when combined with centrifugal pumps. Water filled rewindable stator design. Standard construction is for 304SS stator with cast iron ends. The 6” and 8” series have NEMA shaft and coupling dimensions. The 10” and 12” have borehole pump suitable dimensions. Suitable for use with VFD. The cable lead supplied complies with WRAS (Water Regulation Advisory Scheme – BS 6920).

CentriPro CP6W & 8W series.
- Voltage 380-400V/50Hz +/-10%
- Power range CP6W: 4kW to 37kW
  CP8W: 30kW to 93kW
- Protection class IP68
- Maximum submergence 350m
- Class Y insulation on standard products
- Maximum water temperature 30°C
  CP6W minimum cooling velocity of 0.2m/sec 4kW to 30kW (0.5 for 37kW), CP8W minimum cooling velocity of 0.5m/sec 30kW to 93kW
- Axial load thrust with kingsbury bearing;
  - CP6W 6,000N to 22kW and 30,000N to 37kW
  - CP8W 50,000N
- Maximum starts per hour at regular intervals
  CP6W: 15, CP8W: 10
- Mechanical shaft seal incorporating sand guard
- Compensating bellows for internal liquid thermal expansion

CentriPro CP10W & 12W series.
- Voltage 380-400V/50Hz +/-10%
- Power range CP10W; 93kW to 150kW
  CP12W; 185kW to 300kW
- Protection class IP68
- Maximum submergence 350m
- Class Y insulation on standard products
- Maximum water temperature 30°C
  CP10W; minimum cooling velocity of 0.5m/sec
  CP12W; minimum cooling velocity of 0.5m/sec
- Axial load thrust with kingsbury bearing;
  - CP10W; 65,000N
  - CP12W; 65,000N
- Maximum Starts per hour at regular intervals
  CP6W; 8, CP8W; 4
- Mechanical shaft seal incorporating sand guard
- Compensating bellows for internal liquid thermal expansion

Construction Options
- All 316 SS version
- All Duplex version

Optional Features
- High temperature winding for up to 60°C – check de-ration over 45°C
- Special voltages and 4 pole versions
- Pt 100 temperature protection sensors & controllers
- Silicon carbide mechanical seal
Submersible Pumps for Dewatering & Sewage
Submersible dewatering.

**DOC series.**
Compact, versatile and light weight. Suitable for clean and domestic water applications.

**Applications**
- Emptying of residential areas such as cellars and pits
- Pumping domestic wastewater
- Emptying water tanks and storage vessels

**Specifications**
- Flow up to 14 m³/hr
- Heads up to 11m
- Solid handling DOC3-DOC7 to 10mm
  DOC7VX to 20mm
- Built in thermal overload protection
- Manual and automatic start
  Maximum pump down level 50 mm
- Maximum depth of submergence 5m
- Cable length 5m, options to 10m
- Maximum liquid temperature 40°C
- DOC 7 has a capacity of up to 13.5 m³/hr and delivery head of up to 11m and is suitable for 10 mm solids in suspension
- DOC 7VX has a capacity of up to 10.5 m³/hr and 7m maximum head delivery. It can pump liquid with solids in suspension having maximum dimensions of 20 mm
- Versions
  - Single-phase 220-240V 50 Hz 2 pole
  - Three-phase 380-415V 50 Hz 2 pole

**Features**
- Built in capacitor
- Built in thermal motor protection
- Single-phase versions can be equipped with pre-assembled float for automatic pump operation
- Three phase version available

### PERFORMANCE CURVE AT 2850 RPM

### MATERIAL TABLE

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump body and inlet grill</td>
<td>TECHNOPOLYMER</td>
</tr>
<tr>
<td>Handle and upper support</td>
<td>TECHNOPOLYMER</td>
</tr>
<tr>
<td>Impeller</td>
<td>TECHNOPOLYMER</td>
</tr>
<tr>
<td>Outer casing</td>
<td>STAINLESS STEEL (AISI 304)</td>
</tr>
<tr>
<td>Motor casing</td>
<td>STAINLESS STEEL (AISI 304)</td>
</tr>
<tr>
<td>Lower casing</td>
<td>STAINLESS STEEL (AISI 304)</td>
</tr>
<tr>
<td>Shaft extension</td>
<td>STAINLESS STEEL (AISI 304)</td>
</tr>
<tr>
<td>Screws and bolts</td>
<td>STAINLESS STEEL (AISI 304)</td>
</tr>
<tr>
<td>Elastomers</td>
<td>NITRILE RUBBER (NBR)</td>
</tr>
</tbody>
</table>
DIWA series.
For drainage of cellars, sumps, basements and tanks. Dirty water transfer, garden irrigation, fountains and water features.

Features
- Flows to 25 m³/hr
- Heads to 20m
- Open impeller for solids to 8mm
- Coated replaceable wear plate
- Lowara double mechanical seal system
- 4 models up to 1.5 kW
- Maximum submergence 7m
- Manual and automatic models

DN series.
Submersible pumps for dirty water. Made in cast iron and stainless steel, with mechanical seal and open impeller with abrasion-resistant rubber coating. Supplied with or without float switch.

Applications
- Emptying of drains, rain water tanks or domestic wastewater
- Emptying of wells and tanks in industrial and ecological applications
- Lawn and garden irrigation
- Emptying of tanks or reservoirs
- Emergency draining in flooded areas

Specifications
- Flow up to 17 m³/hr
- Heads up to 20m
- Maximum depth of submergence 5m
Submersible wastewater.

**DOMO series.**

For drainage of cellars, sumps, basements, tanks, dams and dirty water transfer.

- Flows to 40 m³/hr
- Heads to 14m
- Twin channel and vortex impeller versions
- Single phase versions up to 1.1 kW
  - Three phase versions up to 1.5 kW
- Lowara DRIVE LUB double seal system
- Maximum solids handling
  - 35mm for DOMO 7 and DOMO 7VX
  - 50mm for DOMO 10-15-20
  - 50mm for DOMO 10-15-20VX
- Maximum submergence 5m
- Manual and automatic models

**Applications**

- Emptying of septic tanks and residential sumps
- Pumping of effluent (the VX version also pumps suspended solids)
- Emptying of wells and tanks in industrial and ecological applications
- Emptying of tanks and reservoirs
- Emergency draining in flooded areas

**Materials**

- Pump body & motor casing: stainless steel
- Shaft: stainless steel
- Handle: nylon
- DOMO 7 (VX) Impeller: reinforced nylon
- DOMO 10-15-20 (VX) impeller: stainless steel
- Upper lip seal: NBR
GL & DL series.

Submersible pumps designed for drainage of waste water from cesspools, collecting tanks, excavations, dams and dirty water transfer.

Features
- Flows to 42 m³/hr
- Heads to 21m
- Maximum submergence 5m
- Lifting devices available

GL-GLV series with cast iron motor
- 304SS construction impellers in single-channel or vortex design
- Mechanical seal protected by sand labyrinth
- Single and three phase versions to 2.2kW
- Maximum liquid temperatures
  30°C partially submerged / 50°C full submerged

DL-DLV series with solids handling capabilities and stainless steel motor
- Single-channel or vortex impeller designs
- Mechanical seal of SiC/SiC/NBR construction as standard
- Single and three phase versions to 1.5kW
- Maximum liquid temperatures:
  25°C partially submerged / 50°C full submerged
- Maximum solids handling
  - 45mm: DL80, 90, 105
  - 50mm: DL109, 125, 160, DLV100, 115
G2-V series.

For pumping sewage water and suspended solid bodies, in particular for drainage of septic tanks and other civil or industrial applications.

Applications
- Emptying of septic tanks and residential sumps
- Pumping of effluent
- Emptying of wells and tanks in industrial and ecological applications
- Emergency draining in flooded areas

Specifications & Features
- Delivery up to 24 m³/hr
- Heads up to 29m
- Maximum water temperature to 40°C
- Free passage 50mm or 70mm
- Class H motor insulation
- Single phase 400V/50Hz, 1.4kW to 3.2kW (P2)
- Three phase 400-690V/50Hz, 5kW to 7.4kW (P2)
- Mechanical seal SiC/SiC
- O-ring and lip seal in nitrile
- Discharges of either DN50 or DN80

Options
- Lowering & Connection systems to suit
Grinder.

DOMO GRI series.

The pump has been designed to deliver domestic sewage, waste water and fluids containing solids from residential to sewer mains. Features new grinder system and efficient pump to make a reliable package.

Applications
• Residential and domestic sewage

Specifications & Features
• Delivery up to 6.5 m³/hr
• Heads up to 21m
• Single phase 220-240V/50Hz, 1.1 kW (P2)
• Three phase 380-415V/50Hz, 1.1 kW (P2)
• Mechanical seal of SiC/SiC/NBR
• All delivery ports Rp 1

Options
• Single phase with float for auto-operation
• Lowering & Connection systems to suit
G2-T series.

Designed for sewage and other wastewater applications where water quality does not allow large solids passing through pipe work. Generating high heads and enabling the use of long discharge pipes.

Applications
- Residential and commercial sewage
- Draining of flooded excavations
- Farm effluent

Specifications & Features
- Delivery up to 16 m³/hr
- Heads up to 46m
- Maximum water temperature to 40°C
- Free passage 6mm or 7mm
- Class H motor insulation
- Single phase 230V/50Hz, 1.1kW to 1.8kW (P2)
- Three phase 400V/50Hz, 1.1kW to 5kW (P2)
- Mechanical seal SiC/SiC
- O-ring and lip seal in nitrile
- All discharges of DN40

Options
- Single phase comes with starting panel and float for auto-operation
- Lowering & Connection systems to suit
Multistage centrifugal submersible pump.

SCUBA series.

The SC Series of pumps are specifically designed for clean water pumping with major components in 304SS. The liquid end and motor are combined in one package with the pump fluid providing the motor cooling. These pumps can be directly installed into tanks or wells to avoid suction problems and noise.

Applications
- Water supply from tank, 6” wells and basins
- Rain water tank collection
- Pressure boosting
- Irrigation

Specifications
- Flow up to 7.5 m³/hr
- Heads to 80m
- Maximum submergence 20m
- Single and three phase versions available. Single phase includes internal capacitor and thermal protection
- Water temperature 0˚C to +40˚C
- Suspended solids to 2.5mm
- Single phase available in automatic or manual control
The SGR high quality multistage submersible pump is designed where you need to deliver higher pressures with clean water applications. The SGR Series pump is compact, light weight and features a glass lled techno polymer pump body, stainless steel motor housing and shaft with built in overload protection.

Applications
- Water supply from rain water tanks
- Small drainage pits
- Reservoirs
- Emergency drainage of flooded areas
- Irrigation
- Residential cisterns applications

Specifications
- Head: up to 30 meters
- Delivery: up to 5.5 m$^3$/hr
- Maximum immersion depth: 6 meters
- Max. working pressure: 8 bar
- Fluid temperature up to 35°C
- Manual and auto versions
SPG series.

The SPG Series submersible sump pump is a simple and easy solution to your water drainage needs. Its lightweight design and corrosion-resistant construction is ideal for indoor and outdoor installations. The pump includes tethered wide angle float switch that is adjustable for various liquid levels and a discharge hose adaptor kit.

Applications

• Water supply applications
• Draining of basements or sumps
• Water transfer for garden or lawn irrigation
• Dewatering of tanks
• Emergency draining of flooded areas

Specifications

• Discharge size: 1 ¼” BSP
• Capacities: to 10.0 m³/hr
• Maximum head: 8.5 m
• Maximum solids: 3 mm spherical
• Temperature: 40°C (104°F) maximum liquid temperature
• Mechanical seal: ceramic/ silicon carbide with BUNA elastomers
• Single phase, 2900 RPM, 50Hz motor with built-in thermal overload protection with automatic reset
• 10m power cord with A&NZ plug
• CE approved
Goulds Water Technology Pumps
Goulds water technology pumps.

The following are selected pump models from our wide range of Goulds Water Technology offering, which includes a variety of robust cast construction pumps suitable for diverse applications.

Comprehensive catalogues are available for each individual series.

GIS-GISO series: horizontal centrifugal ISO pumps.

- Delivery: Max 900 m³/hr
- Fluid temperature: -15°C to +120°C
- Working pressure: Max 16 bar

Applications
- Water supply
- Heating and air-conditioning system
- Fire protection
- Spray irrigation and transfer
- Boiler water supply
- Industrial transportation
- Vehicle washing

HSC-S series: double entry split case pumps.

- Delivery: Max 1,500 m³/hr
- Head: Max 180m
- Fluid temperature: -20°C to +120°C
- Working pressure: Nom Max 25 bar

Applications
- Water supply
- Water treatment
- Boiler water supply
- Commercial supply
Submersible turbine pumps.
- Cast construction submersible pumps
- Delivery: Flows up to 1800 m³/hr
- Head: to 300m
- Various materials of construction are available on request

Applications
- Irrigation
- Municipal water supply
- Pressure booster systems
- Dewatering

P & MP series:
cast construction multistage pumps.
- Delivery: Max. 340 m³/hr
- Head: Max. 150m
- Fluid temperature: -30°C to +120°C

Applications
- Water supply
- Heating and air-conditioning
- Fire protection
- Spray and irrigation
- Boiler water supply
- Industrial fluid
- Transportation
- Vehicle washing equipment
Pressure Tanks
Pressure tanks.

The additions of pressure tanks to pumps reduce pumps’ on/off cycles and lengthen motor and switch life. This helps to bring down the total operational costs.

Pressure wave.

- Single diaphragm design
- NSF Standard 61, CE/PED, WRAS, ACS, ISO:9001, Gost approved
- Patented stainless steel water connection
- Virgin polypropylene liner
- Two part polyurethane, epoxy primed paint finish
- Leak free, o-ring sealed air valve cap
- Comprehensive testing
- No maintenance

Challenger.

- Patented CAD2 diaphragm technology
- NSF Standard 61, CE/PD, WRAS, ACS, ISO-9001, gost approved
- Stainless steel water connection
- Condensation reducing design
- Two part polyurethane, epoxy primed paint finish
- Leak free air valve cap sealed with closed cell foam
- Comprehensive testing
- No maintenance
**C2 Lite.**

- Patented CAD-2 diaphragm technology
- Unique 3 piece construction
- Reinforced plastic connection
- Durable continuous strand fiberglass sealed with epoxy resin
- Rugged copolymer polypropylene base
- Quality brass air stem with o-ring seal
- No sweat design
- NSF, CE/PED, WRAS, ACS, ISO-9001 approved
- Comprehensive testing
- No maintenance

---

**PRESSURE WAVE SERIES**

<table>
<thead>
<tr>
<th>Type</th>
<th>Model Number</th>
<th>Rated Litres</th>
<th>Drawdown in Litres at System Operating Pressure Range of: (kPa)</th>
<th>System Connection</th>
<th>Dimensions (cm)</th>
<th>Shipping Weight (kg)</th>
<th>Factory Precharge Pressure (kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>140/275</td>
<td>210/345</td>
<td>275/415</td>
<td>Height</td>
<td>Dia</td>
</tr>
<tr>
<td>STEEL TANKS - RATED @ 1000 kPa (nominal 10 Bar)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWL4</td>
<td>MGBPA-LOW-4LX</td>
<td>4</td>
<td>1.3</td>
<td>1.3</td>
<td>1.0</td>
<td>1&quot; BSPT</td>
<td></td>
</tr>
<tr>
<td>PWL8</td>
<td>PWB-LOW-8LX</td>
<td>8</td>
<td>2.8</td>
<td>2.3</td>
<td>2.1</td>
<td>1&quot; BSPT</td>
<td>31.3</td>
</tr>
<tr>
<td>PWL12</td>
<td>PWB-LOW-12LX</td>
<td>12</td>
<td>4.2</td>
<td>3.5</td>
<td>3.2</td>
<td>1&quot; BSPT</td>
<td>36.5</td>
</tr>
<tr>
<td>PWL18</td>
<td>PWB-LOW-18LX</td>
<td>18</td>
<td>6.4</td>
<td>5.4</td>
<td>4.8</td>
<td>1&quot; BSPT</td>
<td>36.7</td>
</tr>
<tr>
<td>PWL24</td>
<td>PWB-LOW-24LX</td>
<td>24</td>
<td>8.5</td>
<td>7.2</td>
<td>6.4</td>
<td>1&quot; BSPT</td>
<td>44.7</td>
</tr>
<tr>
<td>PWL35</td>
<td>PWB-LOW-35LX</td>
<td>35</td>
<td>12.5</td>
<td>10.5</td>
<td>9.4</td>
<td>1&quot; BSPT</td>
<td>48.3</td>
</tr>
<tr>
<td>PWL35V</td>
<td>PWB-LOW-35LV</td>
<td>35</td>
<td>12.5</td>
<td>10.5</td>
<td>9.4</td>
<td>1&quot; BSPP</td>
<td>55.5</td>
</tr>
<tr>
<td>PWL60V</td>
<td>PWB-LOW-60LV</td>
<td>60</td>
<td>21.5</td>
<td>18.1</td>
<td>16.2</td>
<td>1&quot; BSPP</td>
<td>62.0</td>
</tr>
<tr>
<td>PWL80V</td>
<td>PWB-LOW-80LV</td>
<td>80</td>
<td>28.7</td>
<td>24.2</td>
<td>21.6</td>
<td>1&quot; BSPP</td>
<td>81.5</td>
</tr>
<tr>
<td>PWL100V</td>
<td>PWB-LOW-100LV</td>
<td>100</td>
<td>35.9</td>
<td>30.2</td>
<td>27.1</td>
<td>1&quot; BSPP</td>
<td>80.4</td>
</tr>
<tr>
<td>PWL150V</td>
<td>PWB-LOW-150LV</td>
<td>150</td>
<td>53.9</td>
<td>45.4</td>
<td>40.7</td>
<td>1&quot; BSPP</td>
<td>107.4</td>
</tr>
<tr>
<td>HORIZONTAL TANKS - RATED @ 1000 kPa (nominal 10 Bar)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWL24H</td>
<td>PWB-LOW-24HL</td>
<td>24</td>
<td>8.5</td>
<td>7.2</td>
<td>6.4</td>
<td>1&quot; BSPT</td>
<td>44.7</td>
</tr>
<tr>
<td>PWL60H</td>
<td>PWB-LOW-60HL</td>
<td>60</td>
<td>21.5</td>
<td>18.1</td>
<td>16.2</td>
<td>1&quot; BSPT</td>
<td>53.0</td>
</tr>
<tr>
<td>HIGH PRESSURE STEEL TANKS - RATED @ 1600 kPa (nominal 16 Bar)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWL16</td>
<td>MXB-LOW-8LX</td>
<td>8</td>
<td>2.8</td>
<td>2.3</td>
<td>2.1</td>
<td>1&quot; BSPT</td>
<td>31.3</td>
</tr>
<tr>
<td>PWL12</td>
<td>MXB-LOW-12LX</td>
<td>12</td>
<td>4.2</td>
<td>3.5</td>
<td>3.2</td>
<td>1&quot; BSPT</td>
<td>36.8</td>
</tr>
<tr>
<td>PWL18</td>
<td>MXB-LOW-18LX</td>
<td>18</td>
<td>6.4</td>
<td>5.4</td>
<td>4.8</td>
<td>1&quot; BSPT</td>
<td>36.7</td>
</tr>
<tr>
<td>PWL24</td>
<td>MXB-LOW-24LX</td>
<td>24</td>
<td>8.5</td>
<td>7.2</td>
<td>6.4</td>
<td>1&quot; BSPT</td>
<td>44.7</td>
</tr>
<tr>
<td>PWL35</td>
<td>MXB-LOW-35LX</td>
<td>35</td>
<td>12.5</td>
<td>10.5</td>
<td>9.4</td>
<td>1&quot; BSPT</td>
<td>48.1</td>
</tr>
<tr>
<td>PWL60V</td>
<td>MXB-LOW-60LV</td>
<td>60</td>
<td>21.5</td>
<td>18.1</td>
<td>16.2</td>
<td>1&quot; BSPP</td>
<td>62.0</td>
</tr>
</tbody>
</table>

---

**CHALLENGER SERIES**

<table>
<thead>
<tr>
<th>Type</th>
<th>Model Number</th>
<th>Rated Litres</th>
<th>Drawdown in Litres at System Operating Pressure</th>
<th>System Connection</th>
<th>Dimensions (cm)</th>
<th>Shipping Weight (kg)</th>
<th>Factory Precharge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>140/275</td>
<td>210/345</td>
<td>275/415</td>
<td>Height</td>
<td>Length</td>
</tr>
<tr>
<td>STEEL TANKS - RATED @ 1000 kPa (nominal 10 Bar)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GLC120-PC144</td>
<td>GC-LOW-200LV</td>
<td>200</td>
<td>71.9</td>
<td>50.6</td>
<td>54.3</td>
<td>1 1/8 BSPP</td>
<td>103.3</td>
</tr>
<tr>
<td>GLC1240-PC141</td>
<td>GC-LOW-250LV</td>
<td>250</td>
<td>89.9</td>
<td>75.7</td>
<td>67.9</td>
<td>1 3/8 BSPP</td>
<td>121.2</td>
</tr>
<tr>
<td>GLC310-PC244</td>
<td>GC-LOW-300LV</td>
<td>300</td>
<td>107.9</td>
<td>90.9</td>
<td>81.5</td>
<td>1 3/8 BSPP</td>
<td>150.0</td>
</tr>
<tr>
<td>GLC1450-PC366</td>
<td>GC-LOW-450LV</td>
<td>450</td>
<td>181.9</td>
<td>136.4</td>
<td>122.2</td>
<td>1 3/8 BSPP</td>
<td>152.9</td>
</tr>
</tbody>
</table>

---

**C2-LITE CAD SERIES**

<table>
<thead>
<tr>
<th>C2-LITE CAD Series</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Model Number</td>
<td>Rated Litres</td>
<td>Drawdown in Litres at System Operating Pressure</td>
<td>System Connection</td>
<td>Dimensions (cm)</td>
<td>Shipping Weight (kg)</td>
<td>Factory Precharge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>140/275</td>
<td>210/345</td>
<td>275/415</td>
<td>Height</td>
<td>Length</td>
</tr>
<tr>
<td>COMPOSITE TANKS - RATED @ 860 kPa (nominal 8.6 Bar)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2B60</td>
<td>C2B-60LV</td>
<td>60</td>
<td>21.5</td>
<td>18.1</td>
<td>16.2</td>
<td>1&quot; BSPT</td>
<td>64.9</td>
</tr>
<tr>
<td>C2B80</td>
<td>C2B-80LV</td>
<td>80</td>
<td>28.7</td>
<td>24.2</td>
<td>21.6</td>
<td>1&quot; BSPT</td>
<td>85.2</td>
</tr>
<tr>
<td>C2B100</td>
<td>C2B-100LV</td>
<td>100</td>
<td>35.9</td>
<td>30.2</td>
<td>27.1</td>
<td>1&quot; BSPT</td>
<td>96.7</td>
</tr>
</tbody>
</table>
Pump fundamentals.

System curves.

For a specific impeller diameter and speed, a centrifugal pump has a fixed and predictable performance curve.

The point where a pump will operate on its curve is dependent upon the characteristics of the system it is operating in. This is commonly called the System Head Curve. The head in a typical system is made up of three components:

1. Static head.
2. Pressure head.
3. All losses i.e. friction.

This is represented in graphic form and since friction losses vary as the square of the flow rate, the system curve is parabolic in shape.

By plotting the system head curve and the pump curve together, it can be determined:

1. Where the pump will operate on its curve.
2. What changes will occur if the system curve or the pump performance curve changes.

A centrifugal pump will always operate at the intersection of the system curve and the pump curve. This represents the head required to make liquid flow through the system piping, valves etc.

The diagram above represents a pump system. The parabolic shape of the system curve is determined by the friction losses through the pipework including all bends and valves. The suction and discharge tanks are on different levels resulting in a positive static head ‘H’. The static head does not affect the shape of the system curve or its ‘steepness’, but it does dictate the head of the system curve at zero flow rate.

The operating point is at the intersection of the system curve and the pump curve. The flow rate can be reduced by closing, or ‘throttling’, the discharge valve. Throttling increases system friction losses and changes the system curve and the operating point of the pump.

Net Positive Suction Head (NPSH).

Simply stated, NPSH is an analysis of the energy conditions on the suction side of the pump to determine if the liquid will vapourise at the lowest pressure point of the pump.

The pressure that a liquid exerts on its surroundings is dependent on its temperature. This pressure is called its vapour pressure. It is a unique characteristic of every fluid and it increases with temperature. When the vapour pressure of a fluid equals the pressure of its surroundings, the fluid begins to vapourise, or boil.

If we wish to pump a fluid effectively we must keep it in liquid form. NPSH is simply a measure of the amount of suction head present to prevent this vapourisation at the lowest pressure point in the pump.

NPSH required is a function of the pump design and varies with speed and capacity.

NPSH available is a function of the system the pump is operating in. It is the excess pressure of the liquid, in metres absolute, over its vapour pressure as it arrives at the pump suction.

NPSH available must always be greater than NPSH required at the maximum required flow rate.
The diagrams below show typical suction systems with NPSH available formulas applicable to each. It is important to correct for the specific gravity of the liquid and to convert all terms to units of metres absolute when using the formulas.

PB = Barometric pressure, in metres absolute
VP = Vapour pressure of the liquid at maximum pumping temperature in metres absolute
LS = Maximum suction lift in metres
LH = Maximum suction head in metres
hf = Friction loss in the suction pipe at required capacity in metres
## Piping frictional losses.

### Friction Loss for PVC Pipe (m/100 metres of pipe)

<table>
<thead>
<tr>
<th>Flow Rate (lpm)</th>
<th>25mm</th>
<th>32mm</th>
<th>40mm</th>
<th>50mm</th>
<th>63mm</th>
<th>75mm</th>
<th>90mm</th>
<th>110mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>12</td>
<td>0.72</td>
<td>0.43</td>
<td>0.49</td>
<td>0.14</td>
<td>0.16</td>
<td>0.08</td>
<td>0.42</td>
</tr>
<tr>
<td>0.5</td>
<td>30</td>
<td>1.80</td>
<td>2.15</td>
<td>2.40</td>
<td>0.70</td>
<td>0.80</td>
<td>0.37</td>
<td>0.97</td>
</tr>
<tr>
<td>0.8</td>
<td>48</td>
<td>2.88</td>
<td>4.91</td>
<td>5.50</td>
<td>1.61</td>
<td>1.82</td>
<td>0.84</td>
<td>1.43</td>
</tr>
<tr>
<td>1.0</td>
<td>60</td>
<td>3.60</td>
<td>7.29</td>
<td>8.16</td>
<td>2.38</td>
<td>2.70</td>
<td>1.24</td>
<td>3.30</td>
</tr>
<tr>
<td>1.6</td>
<td>96</td>
<td>5.76</td>
<td>16.85</td>
<td>18.87</td>
<td>5.49</td>
<td>6.23</td>
<td>2.86</td>
<td>4.90</td>
</tr>
<tr>
<td>2.0</td>
<td>120</td>
<td>7.20</td>
<td>18.7</td>
<td>19.8</td>
<td>7.43</td>
<td>8.49</td>
<td>1.60</td>
<td>1.83</td>
</tr>
<tr>
<td>3.0</td>
<td>180</td>
<td>10.8</td>
<td>27.0</td>
<td>30.0</td>
<td>9.77</td>
<td>11.98</td>
<td>2.70</td>
<td>3.40</td>
</tr>
<tr>
<td>4.0</td>
<td>240</td>
<td>14.4</td>
<td>31.0</td>
<td>34.0</td>
<td>11.28</td>
<td>13.20</td>
<td>3.24</td>
<td>4.08</td>
</tr>
<tr>
<td>5.0</td>
<td>300</td>
<td>18.0</td>
<td>35.0</td>
<td>39.0</td>
<td>12.80</td>
<td>14.80</td>
<td>3.79</td>
<td>4.72</td>
</tr>
<tr>
<td>6.0</td>
<td>360</td>
<td>21.6</td>
<td>40.0</td>
<td>44.0</td>
<td>14.32</td>
<td>16.32</td>
<td>4.24</td>
<td>5.28</td>
</tr>
<tr>
<td>7.0</td>
<td>420</td>
<td>25.2</td>
<td>45.0</td>
<td>49.0</td>
<td>15.84</td>
<td>17.84</td>
<td>4.70</td>
<td>5.89</td>
</tr>
<tr>
<td>8.0</td>
<td>480</td>
<td>28.8</td>
<td>50.0</td>
<td>54.0</td>
<td>17.36</td>
<td>19.36</td>
<td>5.16</td>
<td>6.46</td>
</tr>
<tr>
<td>9.0</td>
<td>540</td>
<td>32.4</td>
<td>55.0</td>
<td>59.0</td>
<td>18.88</td>
<td>20.88</td>
<td>5.62</td>
<td>7.04</td>
</tr>
<tr>
<td>10.0</td>
<td>600</td>
<td>36.0</td>
<td>60.0</td>
<td>64.0</td>
<td>20.40</td>
<td>22.40</td>
<td>6.08</td>
<td>7.62</td>
</tr>
<tr>
<td>15.0</td>
<td>900</td>
<td>54.0</td>
<td>90.0</td>
<td>90.0</td>
<td>30.60</td>
<td>32.60</td>
<td>9.06</td>
<td>10.80</td>
</tr>
<tr>
<td>20.0</td>
<td>1200</td>
<td>72.0</td>
<td>120.0</td>
<td>120.0</td>
<td>40.80</td>
<td>42.80</td>
<td>12.04</td>
<td>14.40</td>
</tr>
</tbody>
</table>

### Friction Loss for Poly Pipe (m/100 metres of pipe)

<table>
<thead>
<tr>
<th>Flow Rate (lpm)</th>
<th>25mm O.D.</th>
<th>32mm O.D.</th>
<th>40mm O.D.</th>
<th>50mm O.D.</th>
<th>63mm O.D.</th>
<th>75mm O.D.</th>
<th>90mm O.D.</th>
<th>110mm O.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>12</td>
<td>0.72</td>
<td>0.43</td>
<td>0.49</td>
<td>0.14</td>
<td>0.16</td>
<td>0.08</td>
<td>0.42</td>
</tr>
<tr>
<td>0.5</td>
<td>30</td>
<td>1.80</td>
<td>2.15</td>
<td>2.40</td>
<td>0.70</td>
<td>0.80</td>
<td>0.37</td>
<td>0.97</td>
</tr>
<tr>
<td>0.8</td>
<td>48</td>
<td>2.88</td>
<td>4.91</td>
<td>5.50</td>
<td>1.61</td>
<td>1.82</td>
<td>0.84</td>
<td>1.43</td>
</tr>
<tr>
<td>1.0</td>
<td>60</td>
<td>3.60</td>
<td>7.29</td>
<td>8.16</td>
<td>2.38</td>
<td>2.70</td>
<td>1.24</td>
<td>3.30</td>
</tr>
<tr>
<td>1.6</td>
<td>96</td>
<td>5.76</td>
<td>16.85</td>
<td>18.87</td>
<td>5.49</td>
<td>6.23</td>
<td>2.86</td>
<td>4.90</td>
</tr>
<tr>
<td>2.0</td>
<td>120</td>
<td>7.20</td>
<td>18.7</td>
<td>19.8</td>
<td>7.43</td>
<td>8.49</td>
<td>1.60</td>
<td>1.83</td>
</tr>
<tr>
<td>3.0</td>
<td>180</td>
<td>10.8</td>
<td>27.0</td>
<td>30.0</td>
<td>9.77</td>
<td>11.98</td>
<td>2.70</td>
<td>3.40</td>
</tr>
<tr>
<td>4.0</td>
<td>240</td>
<td>14.4</td>
<td>31.0</td>
<td>34.0</td>
<td>11.28</td>
<td>13.20</td>
<td>3.24</td>
<td>4.08</td>
</tr>
<tr>
<td>5.0</td>
<td>300</td>
<td>18.0</td>
<td>35.0</td>
<td>39.0</td>
<td>12.80</td>
<td>14.80</td>
<td>3.79</td>
<td>4.72</td>
</tr>
<tr>
<td>6.0</td>
<td>360</td>
<td>21.6</td>
<td>40.0</td>
<td>44.0</td>
<td>14.32</td>
<td>16.32</td>
<td>4.24</td>
<td>5.28</td>
</tr>
<tr>
<td>7.0</td>
<td>420</td>
<td>25.2</td>
<td>45.0</td>
<td>49.0</td>
<td>15.84</td>
<td>17.84</td>
<td>4.70</td>
<td>5.89</td>
</tr>
<tr>
<td>8.0</td>
<td>480</td>
<td>28.8</td>
<td>50.0</td>
<td>54.0</td>
<td>17.36</td>
<td>19.36</td>
<td>5.16</td>
<td>6.46</td>
</tr>
<tr>
<td>9.0</td>
<td>540</td>
<td>32.4</td>
<td>55.0</td>
<td>59.0</td>
<td>18.88</td>
<td>20.88</td>
<td>5.62</td>
<td>7.04</td>
</tr>
<tr>
<td>10.0</td>
<td>600</td>
<td>36.0</td>
<td>60.0</td>
<td>64.0</td>
<td>20.40</td>
<td>22.40</td>
<td>6.08</td>
<td>7.62</td>
</tr>
<tr>
<td>15.0</td>
<td>900</td>
<td>54.0</td>
<td>90.0</td>
<td>90.0</td>
<td>30.60</td>
<td>32.60</td>
<td>9.06</td>
<td>10.80</td>
</tr>
<tr>
<td>20.0</td>
<td>1200</td>
<td>72.0</td>
<td>120.0</td>
<td>120.0</td>
<td>40.80</td>
<td>42.80</td>
<td>12.04</td>
<td>14.40</td>
</tr>
</tbody>
</table>

### Friction Loss for Poly Pipe - 20mm to 63mm (m/100 metres of pipe)

<table>
<thead>
<tr>
<th>Flow in:</th>
<th>20mm</th>
<th>32mm</th>
<th>40mm</th>
<th>50mm</th>
<th>63mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Class B Pipe</td>
<td>PE80/PN10</td>
<td>PE80/PN12.5</td>
<td>PE80/PN16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>132</td>
<td>2.7</td>
<td>0.72</td>
<td>0.43</td>
<td>0.49</td>
</tr>
<tr>
<td>20</td>
<td>264</td>
<td>9.8</td>
<td>2.4</td>
<td>0.80</td>
<td>0.39</td>
</tr>
<tr>
<td>30</td>
<td>396</td>
<td>20.8</td>
<td>5.1</td>
<td>1.7</td>
<td>0.76</td>
</tr>
<tr>
<td>40</td>
<td>528</td>
<td>8.7</td>
<td>2.9</td>
<td>1.2</td>
<td>0.56</td>
</tr>
<tr>
<td>50</td>
<td>660</td>
<td>13.2</td>
<td>4.5</td>
<td>1.8</td>
<td>0.78</td>
</tr>
<tr>
<td>60</td>
<td>792</td>
<td>18.5</td>
<td>6.2</td>
<td>2.6</td>
<td>0.91</td>
</tr>
<tr>
<td>80</td>
<td>1056</td>
<td>30.1</td>
<td>10.6</td>
<td>4.4</td>
<td>1.17</td>
</tr>
<tr>
<td>100</td>
<td>1320</td>
<td>16.1</td>
<td>6.6</td>
<td>1.6</td>
<td>0.93</td>
</tr>
<tr>
<td>120</td>
<td>1584</td>
<td>9.3</td>
<td>2.3</td>
<td>0.73</td>
<td>0.54</td>
</tr>
<tr>
<td>140</td>
<td>1848</td>
<td>12.3</td>
<td>3.0</td>
<td>1.17</td>
<td>0.73</td>
</tr>
<tr>
<td>160</td>
<td>2112</td>
<td>3.9</td>
<td>5.2</td>
<td>2.6</td>
<td>1.17</td>
</tr>
<tr>
<td>180</td>
<td>2376</td>
<td>4.8</td>
<td>2.7</td>
<td>1.3</td>
<td>0.93</td>
</tr>
<tr>
<td>200</td>
<td>2639</td>
<td>5.9</td>
<td>3.3</td>
<td>1.4</td>
<td>1.08</td>
</tr>
<tr>
<td>220</td>
<td>2904</td>
<td>7.0</td>
<td>3.9</td>
<td>1.5</td>
<td>1.18</td>
</tr>
<tr>
<td>240</td>
<td>3168</td>
<td>8.2</td>
<td>4.6</td>
<td>1.6</td>
<td>1.28</td>
</tr>
<tr>
<td>250</td>
<td>3330</td>
<td>8.9</td>
<td>5.0</td>
<td>1.7</td>
<td>1.38</td>
</tr>
</tbody>
</table>
Xylem |ˈzɪləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We’re 12,000 people unified in a common purpose: creating innovative solutions to meet our world’s water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to www.xyleminc.com