Multistage Centrifugal Pump
MSN (BB3)
Axially Split – Double volute
Single and Double Suction

About us
BHGE is a leading global supplier with a large portfolio of products and competences. Pumps manufacturing started in 1959 with the brand of Nuovo Pignone under UCP license. Throughout the years the pump designs have been improved based on our experience with rotating machinery (Nuovo Pignone compressors and gas turbines). With over 18,000 pumps installed worldwide, compliant with API610/ISO13709 and ISO9905 specification, the Nuovo Pignone centrifugal pumps center of excellence is located in Bari (Italy), with main testing facilities, and a model test laboratory to accurately characterize new hydraulics. The design and production is certified ISO9001 and ISO/TS29001. BHGE capability goes from conceptual design to field installation of complete pumping systems, including drivers like EM, GT, ST, gas engines, and the controls and all the auxiliary systems. There are over 1000 operating MSN pumps.

Applications
MSN has been designed to fit the requirements for several services like pipeline, boiler feed, refinery services, amine gas treatment, reverse osmosis plants, energy recovery and CO₂ injection.
**Design Features**

1. Bearings with forced or ring oil lubrication. All frames can be fitted with proximity probes and RTDs.
2. Integral centerline mounting feet increase tolerance to thermal expansion.
3. Optional intermediate pressure take-off.
4. Double volutes minimize radial load on the rotor over the whole operating range.
5. Mechanical seal chamber compliant with API682/ISO21049 to accommodate the most complex configurations.
6. Inlet and outlet flanges are integral to the lower half of the case allowing maintenance without disconnection of the process piping.
7. Precision-casted impellers to maximize performance predictability and hydraulic radial load balance. They are shrink fitted to avoid fretting and residual unbalance. First stage impeller available with single or double suction.
8. Hard coating on all mating surfaces of stage seals and balancing drum to increase life.
9. The rotor, balanced as an assembly, has a back-to-back impeller arrangement to achieve compensation of the axial thrust even with worn clearances. The shaft is stepped to facilitate mounting of impellers.
10. Integral balancing flow line.

**Operating Data**

<table>
<thead>
<tr>
<th>Performance Parameter</th>
<th>Specifics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Differential head</strong></td>
<td>up to 2800 m</td>
</tr>
<tr>
<td><strong>Flowrate</strong></td>
<td>up to 2600 m³/h</td>
</tr>
<tr>
<td><strong>Shaft power</strong></td>
<td>up to 10 MW</td>
</tr>
<tr>
<td><strong>Pressure</strong></td>
<td>up to 300 bar</td>
</tr>
<tr>
<td><strong>Rotational speed</strong></td>
<td>up to 6000 RPM</td>
</tr>
<tr>
<td><strong>Head rise</strong></td>
<td>15±30%</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>-10°C÷200°C</td>
</tr>
<tr>
<td><strong>Impeller diameters</strong></td>
<td>225÷680 mm</td>
</tr>
</tbody>
</table>

Standard frames are: 3x9, 4x10, 4x11, 4x12, 4x13, 6x11, 6x14, 6x19, 8x13, 8x15, 8x20, 10x16, 10x24, 12x21, 16x27, 20x27. Tailor made sizes are also available.

**Performance Range**

- Differential head vs. Flowrate
- High speed
- 60 Hz
- 50 Hz

**Customer Support**

BHGE can provide support during the initial engineering phases with feasibility studies of special purpose pumps or complete pumping systems. Full onsite support during installation and commissioning is available to guarantee flawless execution, quick response through ownership of results. A remote monitoring and diagnostic service is also available. Once the systems are installed BHGE can support the continuous improvement of the operability with conversion, modifications and upgrades:

- Modification to the impellers or replacement of the diffuser to match actual operating conditions. Destaging.
- Upgrade of the wear rings with new ones made of composite materials to reduce the internal leakages and increase the efficiency in case of clean fluids.
- Superfinishing of internal wetted surfaces to increase efficiency.

bhge.com