MK 1000 / 3000 Range

DIAPHRAGM COMPRESSOR SYSTEMS FOR GAS APPLICATIONS

MK-1000-V09-GM / MK-3000-V09-GM
• 1,000 bar / 3,000 bar, for N₂, Ar, He applications
• Start / Stop function
• Asynchron motor drive (Standard)

MK-1000-V09-GM-H² / MK-3000-V09-GM-H²
• 1,000 bar / 3,000 bar, for hydrogen applications.
• Start / Stop function
• Asynchron motor drive in ATEX: II 2G IIC T4 Gb

MK-1000-V09-SD / MK-3000-V09-SD
• 1,000 bar / 3,000 bar, for N₂, Ar, He applications.
• For precise pressure control
• Servo motor drive (Standard)

MK-1000-V09-SD-H² / MK-3000-V09-SD-H²
• 1,000 bar / 3,000 bar, for hydrogen applications.
• For precise pressure control
• Servo motor drive and lubrication unit in ATEX: II 2G IIC T4 Gb

Customized compressor systems on request.

NOVA SWISS
FUTURE TECHNOLOGY ON A WORLD TOUR

The Energy Observer has been travelling around the world since summer 2018. The catamaran is powered by solar, wind and hydrogen energy and is intended to provide information on renewable energies as well as sustainable technology and its potential during its six-year journey. Nova Swiss supplied the H₂ compressor system, which was installed in the expedition boat.
**FUNCTIONAL PRINCIPLE**

- Gas compression from 20 bar (300 psi)* minimum inlet pressure up to 1,000 or 3,000 bar (14,500 or 43,500 psi) maximum outlet pressure
- Standard version for compressing Nitrogen, Argon, Helium or Clean air
- Special explosion proofed version for Hydrogen compression (using special lubrication oil)

In a double concave chamber the gas is compressed by an oscillating membrane insert consisting of three membranes, which is hydromechanically set in motion from one side. The diaphragm «seals and separates» the gas chamber hermetically against the drive unit. The three-part diaphragm insert is clamped between two diaphragm plates on the outer circumference and set in motion by the hydraulic pressure.

**ADVANTAGES**

- Maximal tightness
- Low operational costs
- Very clean: no contamination and no dirt or particles through oil free compression
- Diaphragm plates lifetime up to 2,500 hours (MK1000)
- Several options available

Due to the high leakage-free design of the compressor head, dangerous gases for humans and the environment can safely be compressed to high pressure.

Nova Swiss diaphragm compressors are therefore frequently used for applications with explosive gases.

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* lower inlet pressure upon request
**Technical Data**

**Performace Diagram**

**MK 1000 / 3000 NITROGEN**

1,000 bar, max. 5,000 NL/h 3,000 bar, max. 1,600 NL/h

**MK 1000 / 3000 HYDROGEN**

1,000 bar, max. 4,800 NL/h 3,000 bar, max. 900 NL/h

**Technical Data**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>480 × 350 × 260 mm (height × length × depth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas connection</td>
<td>HP ¼” AWA (Anti vibration connection assembly)</td>
</tr>
<tr>
<td>Weight</td>
<td>38 kg (without options)</td>
</tr>
<tr>
<td>Drive motor (option)</td>
<td></td>
</tr>
<tr>
<td>Gear motor (fixed speed) or Servo motor (0 – 350 RPM)</td>
<td></td>
</tr>
<tr>
<td>Working medium</td>
<td>Nitrogen, Argon, Air, Helium</td>
</tr>
<tr>
<td>Working medium for H₂ types</td>
<td>Additionally Hydrogen, (spec. oil, ATEX: II 2G IIC T4 Gb)</td>
</tr>
<tr>
<td>Suction pressure</td>
<td>min. 20 bar, max. 200 bar</td>
</tr>
<tr>
<td>Discharge pressure</td>
<td>max. 1,000 / 3,000 bar</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>min. 300 RPM, max. 350 RPM</td>
</tr>
<tr>
<td>Power</td>
<td>2.2 kW</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>vertical</td>
</tr>
<tr>
<td>Diaphragm rupture indicator</td>
<td></td>
</tr>
<tr>
<td>Mechanical indicator (pin)</td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>+10 °C ... +40 °C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>+30 °C ... +60 °C</td>
</tr>
</tbody>
</table>

**Discharge pressure [bar]**

**Capacity [NL/h]**

**Capacity [kg/h]**

**Suction pressure**

- Pu = 200 bar
- Pu = 100 bar
- Pu = 50 bar
- Pu = 20 bar
Applications

STANDARD SYSTEMS
- Gas metering units
- Gas filling benches
- Ultrapure gas systems
- Pressure test units
- Pressure supply units
- Laboratory and Research
- Gas leakage detection

CUSTOMIZED SYSTEMS
For our demanding customers we also offer complex customer-specific compressor system solutions.

Parts and options

<table>
<thead>
<tr>
<th>PARTS</th>
<th>OPTIONS FOR UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Gas delivery valve</td>
<td>552.0166 Head turn 45°</td>
</tr>
<tr>
<td>2 Gas inlet valve</td>
<td>552.0169 Unit</td>
</tr>
<tr>
<td>3 Head</td>
<td>552.016 Special Oil for Hydrogen</td>
</tr>
<tr>
<td>4 Diaphragm rupture indicator</td>
<td>552.0168 Head turn 30°</td>
</tr>
<tr>
<td>5 Pin</td>
<td>552.0167 Oil safety valve</td>
</tr>
<tr>
<td>6 Head base</td>
<td>552.0168 Oil safety valve</td>
</tr>
<tr>
<td>7 Air filter</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>8 Oil safety valve</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>9 Membrane accumulator</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>10 Oil pressure gauge</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>11 Oil suction valve</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>12 Type plate</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>13 Oil dip stick/ oil filler</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>14 Oil drain screw</td>
<td>552.0169 Oil safety valve</td>
</tr>
<tr>
<td>15 Oil regulation valve</td>
<td>552.0169 Oil safety valve</td>
</tr>
</tbody>
</table>

STANDARD SYSTEMS
- Gas metering unit
Nitrogen, Argon, CO², 70 bar – 1500 bar

CUSTOMIZED SYSTEMS
For our demanding customers we also offer complex customer-specific compressor system solutions.

High pressure supply system
Argon, 6000 bar

Customized test benches
1000 bar – 10000 bar
High-pressure technology in three variations

STANDARD
Standard valves, fittings, adapters and pipes for the pressure range up to 60 kpsi (4,000 bar).

BUSINESS
High pressure operating systems like Compressors, Gas dosing systems, Hand pumps and Pressure supply units. Supporting pressures up to 145,000 psi (10,000 bar) and gases like hydrogen, nitrogen, carbon dioxide, helium or argon.

EXCLUSIVE
Nova Swiss offers customized high pressure technology applications. Their distinguishing features are: mature product development and design, high precision, made-to-fit connection geometries and simple to use. The high pressure components have proven their service worthiness even under harshest conditions and high physical strain.

DEVELOPMENT AND CONSULTING
We create the basis for sophisticated, new and optimized products in the areas of High Pressure Technology and Engine Components via the continual expansion of our expertise and results-oriented research.

Our material laboratory is equipped with state-of-the-art technology, and it is here that we analyze a wide range of substances in our search for suitable materials and manufacturing processes. Our service spectrum also includes complex calculations of our customers’ requirements. Furthermore, we can also offer interdisciplinary partnerships in the area of surface technology in the form of complex analysis and test procedures for quality testing of coatings.

We constantly ensure that all Nova Swiss products meet the latest requirements of the market as well as all statutory regulations.

Our products and services
- New product development
- Optimizations
- Calculations and simulations
- Analyses and tests of materials and coatings

THE FIRST ELEMENT
Hydrogen was the first element that ever formed. It was the substance that kindled the fire in the stars. On the Earth, the oceans are the largest water resource with a volume of around 1,338,000,000 km³. The sea was also the place where life first began. Water is life and life is progress.

THE EVOLUTION OF TECHNOLOGY
Like evolution, research and development is a continuous process of change. Adapting to current situations, pursuing new approaches and looking at other sectors – this is how a company can make itself future-proof. Products and services from Nova Swiss are highly developed and extremely reliable. Our most important strength is our adaptability. Technologies come and go. However, Nova Swiss has always succeeded in leaving the obsolete behind and integrating new products into the company while maintaining our customary high quality standards.

The future belongs to you
Our pioneering spirit makes Nova Swiss your ideal development partner. For what is and what will be. This is how a workshop business that produced cylinders and crankshafts was able to transform itself into a diversified company with a focus on cutting-edge technology. Join us on our journey into the future.

WHAT MAKES YOU SUPER