Hydrogen purification plant based on pressure swing adsorption – HYDROSWING

Mahler AGS hydrogen purification plants are based on pressure swing adsorption for hydrogen recovery from hydrogen rich gases with capacities from 100 to 50,000 Nm³/h and purities up to 99,9999 vol.-%.

HYDROSWING hydrogen PSA units are designed for the recovery and the purification of hydrogen from different hydrogen rich gases as synthesis gas coming from steam reforming, methanol reforming or from various off-gases. For this task the principle of pressure-swing adsorption (PSA-technology) is applied.

Depending on customers’ focus and demands the hydrogen PSA systems are designed with either 4, 5 or 6 adsorber vessels and different modes of operation. Purities of up to 99,9999 vol.-% hydrogen product quality can be achieved at optimum recovery rates.

The pressure swing adsorption (PSA) technology applies the principle of physically binding the impurities contained in the hydrogen rich gases by individually selected adsorbent materials. Since the binding forces for such impurities depend on the pressure, the PSA operates on an alternating cycle of adsorption at elevated pressures and desorption at decreased pressures.

Plant features of the HYDROSWING hydrogen purification plant

- High recovery rates and low invest cost
- Design for long lifetime
- High availability due to special control system and the feature to switch-back to operation with reduced number of adsorber vessels
- High reliability due to proven first class plant components for PSA-applications (e.g. PSA-valves or butterfly-valves and instruments)
- High quality and high safety standard
- Fully automatic operation and remote control
- Completely pre-manufactured valve skid
- Easy maintenance and accessibility

<table>
<thead>
<tr>
<th>Plant data</th>
<th>Feedstock:</th>
<th>Hydrogen rich gas, synthesis gas</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>100 to 50,000 Nm³/h</td>
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<tr>
<td>Hydrogen capacity:</td>
<td></td>
<td>6-40 bar(abs)</td>
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<td>Feed pressure:</td>
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<tr>
<td>Hydrogen purity:</td>
<td></td>
<td>up to 99,9999 vol.-%</td>
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Additional/Optional features for hydrogen purification units

Individual plant concepts with respect to capacity control, adaption of operation mode for varying operation conditions and online purity monitoring etc. can be offered.

Our plants are used worldwide. Especially for Russia, Belarus and Kazakhstan we are able to provide our plants with all necessary TR certificates and declarations for the import and operation in the Custom Union. Our HYDROSWING plants are equipped with a serial declaration according TR CU 010/2011 (MD), TR CU 004/2011 (LVD) and TR CU 020/2011 (EMC), valid until beginning of 2020. Certificates or declarations according TR CU 032/2013 for all pressure vessels as well as a TR CU 012/2011 certificate for the entire equipment placed inside areas with potentially explosive atmospheres are also part of our scope of supply.