1 General

1.1 Manufacturer

Albert Handtmann Armaturenfabrik GmbH & Co. KG
Arthur-Handtmann-Str. 11; D-88400 Biberach
Tel.: +49(0) 73 51/3 42-0; Fax: +49(0) 73 51/ 3 42-44 80
E-Mail: sales.fittings@handtmann.de

1.2 Proper application

Vacuum valves are used in the food, beverage, pharmaceutical and chemical industries. They are suitable for the protection of tanks and other closed systems against negative pressure.

During installation, operation and maintenance please pay attention to the generally accepted safety regulations as well as to the operating instructions.

1.3 Misuse

Misuse is:
• Application in different operating conditions as intended for the specific type.
• Installation, operation and maintenance by unqualified staff.
• Any unauthorized modification of the valve or a valve component.
• On-observance of the operating instructions.

Any misuse will automatically lead to a loss of right to claim under guarantee as well as any liability.

1.4 Duties of operator

The operator has to make sure that:
• The valve/component is operated properly and only in functional condition.
• The legal requirements are kept during operation and maintenance.
• Only sufficiently qualified and authorized staff maintain the valve/component.
• The staff responsible for operation and maintenance know and obey the operating instructions and in particular the safety advice.
• The safety and warning signs remain on the valve/component and are always legible.
2 Safety Information

Notice and Safety
The following safety advice is an addition to existing national regulations and laws for accident prevention. Existing regulations and laws for accident prevention always have to be adhered to. Pay attention to the specific regulations and laws in your country.

The safety advice does not take into account:

• Coincidences and events that may occur during assembly, operation and maintenance.
• Local safety regulations in responsibility of the operator.

Basic safety advice
Requirements for a proper function of the valve/component:

• Proper transportation and storage
• Installation and setting into operation by authorized staff
• Operation according to these operating instructions – proper application
• Proper and regular maintenance

WARNING

Warning – general dangers!
To avoid danger for health and life the following safety instructions strictly have to be obeyed.

• Assembly and setting into operation only by qualified staff.
• Instruction and supervision by the operator.
• Keeping of technical and electrical data as specified in the operating instructions.
• Guarantee the electric safety of external devices.
• Keep legal regulations.

Non-observance may lead to the following dangers:

• Malfunction of the valve/component respectively of the plant.
• Danger for persons due to electrical, mechanical and chemical affects.
• Danger for the environment due to possible leakage of dangerous media.

3 Delivery, Completeness, Storage

• Check the data of the delivery note for factual correctness and the material for completeness. We regret that money cannot be refunded after purchase.
• Always check the material for transport damages. Possible damages have to be informed immediately.
• Store the material in a dry place and if possible in its original packaging.
4  Installation, Operation, Maintenance

Important notice!

The vacuum valve is similar to type 12504
Type 12817 has a response pressure of 0,5 bar (vacuum).

- Valve/component suitable for vertical installation.
- Valves with standard weight open at a negative pressure of 3-5 mbar.
  Pressure compensation to ambient pressure by air draw in.
  The valve will be closed by the counter pressure of the weight.
- Valves with pneumatic lifting open only at a limited counter pressure, i.e. tank
  inside pressure. This pressure may not exceed 0.2 bar.
  This may cause a malfunction of the valve.
- During the CIP process the pneumatic lifting should be activated only, if the tank
  is depressurized. Otherwise, there will be explosion-like pressure
  compensation, due to the escaping medium. This mixture of gas and CIP
  liquid is splashed into the environment.
- The lifting itself can be performed according to the process requirements. The
duration of lifting should be about 5-20 seconds and can take place during different
cleaning steps. To prevent too strong splashing, the opening gap on the valve can
be adjusted via the stroke on the pneumatic cylinder or lifting takes place during
the startup phase of the pump with reduced power.

Further information can be found in the INFO sheet - IB_CIP lifting VV-SV.02
- During assembly/disassembly please pay attention to the operating instructions
  respectively to the type plate or type marking.

Danger – General risk!
Lifting the valve during CIP and low tank inside pressure (p < 0.2 bar) causes splashing of
penetrating CIP liquid.
An increasing tank inside pressure can be caused by thermal expansion of the CIP
medium during circulation or by pre-stressing of the tank with CO2/gas.
– Stop spraying of the tank before lifting the valve or de-pressurize the tank.
– Use fully closed splash guard.

4.1  Assembly instructions

Execution with heating device:
- The heating insets may only be connected according to attached scheme.
  Pay attention to the connecting voltage!
- Do not remove the heating inset from the flange during function test
  (heating capacity). It may get damaged by overheating.
Execution with lifting device:

- Pneumatic lifting cylinder for function test and for lifting the valve cone during CIP. The stroke of the lifting cylinder is factory preset. So the stroke of the valve cone is limited to about 3 mm. With too large stroke, the emerging splash amount increases.
- Suitable for treated compressed air, max. 6 bar.
- Throttle of air inlet has to be adjusted upon setting into operation.
- Compressed air supply: air hose Ø 6/4.

Fig. 1: Schematic representation with lifting device DN 150 – DN 200

Fig. 2: Schematic representation with lifting device für DN 300 – DN 400

1 Counter weight
2 Lifting adjustment
3 Compressed air supply
Vacuum valve (weight loaded)

12814/12817

Fig. 3: Type 12814 DN 150 - 200 with splash guard cover

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vacuum valve Typ 12504</td>
<td>2</td>
<td>Lifting cylinder</td>
<td>3</td>
<td>Splash guard cover</td>
</tr>
<tr>
<td>4</td>
<td>Cover</td>
<td>5</td>
<td>Locking device</td>
<td>6</td>
<td>CIP connection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DN / connection</th>
<th>D1</th>
<th>D2</th>
<th>L1</th>
<th>H1</th>
<th>H2</th>
<th>H3</th>
<th>H4</th>
<th>H5</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>254 x 2</td>
<td>250</td>
<td>511</td>
<td>271.5</td>
<td>---</td>
<td>69</td>
<td>92.5</td>
<td>242.5</td>
</tr>
<tr>
<td>200</td>
<td>304 x 2</td>
<td>300</td>
<td>611</td>
<td>313.5</td>
<td>---</td>
<td>47</td>
<td>126.5</td>
<td>326.5</td>
</tr>
<tr>
<td>300</td>
<td>306 x 3</td>
<td>450</td>
<td>731</td>
<td>316.5</td>
<td>218</td>
<td>---</td>
<td>185.5</td>
<td>151</td>
</tr>
<tr>
<td>400</td>
<td>406 x 3</td>
<td>600</td>
<td>900</td>
<td>406.5</td>
<td>291.5</td>
<td>---</td>
<td>215.5</td>
<td>402</td>
</tr>
</tbody>
</table>
Vacuum valve (weight loaded)

12814/12817

Fig. 4: Type 12817 DN 100 – 200 with splash guard cover

1 Vacuum valve Typ 12504
2 Lifting cylinder
3 Splash guard cover
4 Cover
5 Locking device
6 CIP connection

<table>
<thead>
<tr>
<th>12817</th>
<th>DN / connection</th>
<th>D1</th>
<th>D2</th>
<th>L1</th>
<th>H1</th>
<th>H2</th>
<th>H3</th>
<th>H4</th>
<th>H5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>204</td>
<td>200</td>
<td>500</td>
<td>292</td>
<td>---</td>
<td>---</td>
<td>90</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>254</td>
<td>250</td>
<td>800</td>
<td>371</td>
<td>---</td>
<td>---</td>
<td>92.5</td>
<td>242.5</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>304</td>
<td>300</td>
<td>900</td>
<td>465.5</td>
<td>---</td>
<td>---</td>
<td>126.5</td>
<td>326.5</td>
</tr>
</tbody>
</table>
4.2 Operation

<table>
<thead>
<tr>
<th>Type 12814 / 12817</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction with stainless steel valve disk DN 150 – DN 400</td>
</tr>
</tbody>
</table>

- Keep the valve clean.
- Lift the valve cone from time to time.
- Exchange the O-ring (1) carefully.
- Avoid any damages at the valve seat.
- Protect vacuum valves from any force influence from outside. Any damage may affect the function.
- Admissible temperature: 125°C

![Fig. 5: with stainless steel valve cone](image)

1. O-ring (seat)
2. O-ring (flange)
3. Guiding band
4. Heating inset
5. Profile seal
4.3 Maintenance

- Maintain the valve carefully, avoid any damages.
- Exchange the O-rings (1) and (2) do not distort.
  Clean the grooves and sealing area.
- **Demounting of:**
  - cover of splash guard cover
  - weight and lever
  - splash guard cover
  - vacuum valve

- **Assembly** in reverse order.

  - The maintenance should be executed at regular intervals of min. every year. Depending on the operating conditions of the valves, these intervals may be shorter.
  - During maintenance pay attention to the assembly and safety instructions.
  - Any maintenance work may be carried out only in a depressurized system.

In case of spare parts orders please inform us the order No.
Gasket material EPDM

4.4 Identification of components

All vacuum valves (VV) must be provided with permanent identification of the component.

- Standard vacuum valves are provided with a setting value (4 mbar) specified by us (opening pressure range 3-5 mbar)
- Special vacuum valves (with special weight) are provided with a customer-specific setting value. They also include the identifying letter “S” before the manufacturing №.

**Explanation of the identification:**

<table>
<thead>
<tr>
<th>Numerical code</th>
<th>AH</th>
<th>VV</th>
<th>xxxx</th>
<th>xxx</th>
<th>yyy</th>
<th>xx / xxxxx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

1. Manufacturer
2. Vacuum valve
3. Valve type
4. Nominal width / DN [mm]
5. Set negative pressure p [mbar]
6. Year of manufacture with manufacturing № or “S” with manufacturing №
4.5 Seals

Fig. 6: Type 12814 DN 150 – 200

10  O-ring
20  O-ring
30  Guiding band
40  Gasket
50  Profile seal

Fig. 7: Type 12817 DN 100 – 200

10  O-ring
20  O-ring
30  Guiding band
40  Gasket
50  Profile seal
60  Flat seal
### Vacuum valve (weight loaded)

**12814/12817**

#### 4.6  Spare parts

<table>
<thead>
<tr>
<th>DN</th>
<th>12814</th>
<th>12817</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>---</td>
<td>012817.00100LE</td>
</tr>
<tr>
<td>150</td>
<td>012814.00150LE</td>
<td>012817.00150LE</td>
</tr>
<tr>
<td>200</td>
<td>012814.00200LE</td>
<td>012817.00200LE</td>
</tr>
<tr>
<td>300</td>
<td>012814.00300LE</td>
<td>---</td>
</tr>
<tr>
<td>400</td>
<td>012814.00400LE</td>
<td>---</td>
</tr>
</tbody>
</table>

LE - EPDM
4.7 Performance diagram

Fig. 8: 12504, DN 80 – DN 400
Conversion: 1 mbar >> 10 mmWS >> 100 Pa >> 0.1 KPa
5 Additional Equipment

5.1 Proximity switch, inductive

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type, make contact</td>
<td>(NO); № 106220 BES M12EE-PSC40B-S04G,</td>
</tr>
<tr>
<td>Nominal switching distance</td>
<td>4 mm even</td>
</tr>
<tr>
<td>&gt;&gt; with trip cam material steel</td>
<td>2,8 mm even</td>
</tr>
<tr>
<td>Supply current U</td>
<td>10 ... 30 VDC</td>
</tr>
<tr>
<td>No-load current bedämpft / unbedämpft</td>
<td>max. 10 mA / max. 5 mA</td>
</tr>
<tr>
<td>Operating current</td>
<td>200 mA</td>
</tr>
<tr>
<td>Potential drop U</td>
<td>max. 2,5 V</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>200 Hz</td>
</tr>
<tr>
<td>Reserve battery protection</td>
<td>yes</td>
</tr>
<tr>
<td>Short-circuit proof</td>
<td>yes</td>
</tr>
<tr>
<td>Construction size</td>
<td>M12x1</td>
</tr>
<tr>
<td>Casing material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-25°C ... +85°C</td>
</tr>
<tr>
<td>Enclosure rating</td>
<td>IP 68</td>
</tr>
<tr>
<td>Indicator</td>
<td>Multi-hole – LED</td>
</tr>
</tbody>
</table>

![Diagram](image)

Fig. 9: Dimensions and connection scheme PNP
## 5.2 Heating insets

<table>
<thead>
<tr>
<th>DN</th>
<th>Connection-scheme №</th>
<th>Connection voltage Volt</th>
<th>Heating capacity Watt</th>
<th>Quantity</th>
<th>Rated power: Volt Watt</th>
<th>Part №</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>11 125E 33</td>
<td>24</td>
<td>184</td>
<td>8</td>
<td>24 23</td>
<td>105373</td>
</tr>
<tr>
<td>300</td>
<td>11 125E10</td>
<td>24</td>
<td>138</td>
<td>6</td>
<td>24 23</td>
<td>105373</td>
</tr>
<tr>
<td>200</td>
<td>11 125E30</td>
<td>24</td>
<td>92</td>
<td>4</td>
<td>24 23</td>
<td>105373</td>
</tr>
<tr>
<td>150</td>
<td>11 125E31</td>
<td>24</td>
<td>46</td>
<td>2</td>
<td>24 23</td>
<td>105373</td>
</tr>
<tr>
<td>100</td>
<td>11 125E31</td>
<td>24</td>
<td>46</td>
<td>2</td>
<td>24 23</td>
<td>105373</td>
</tr>
<tr>
<td>80</td>
<td>11 125E31</td>
<td>24</td>
<td>46</td>
<td>2</td>
<td>24 23</td>
<td>105373</td>
</tr>
</tbody>
</table>

![Heating inset Ø 6,5 x 40](image1)

![Heating inset Ø 6,5 x 40](image2)

Fig. 10: E 33, DN 400

E 10, DN 300
Fig. 11: E 30, DN 200

E 31, DN 80 - DN150

Heating inset Ø 6,5 x 40

Temperature control unit