



## **HAWIDO - REGULATING VALVES**

Instruction for

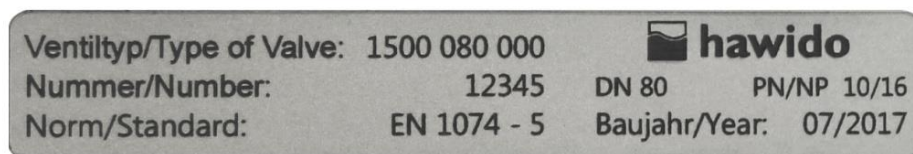
**Pressure Sustaining and Relief Valve  
Type 1400**

**ND40 to ND200**



Keep this instruction manual at the location of the valve

*Example of a nameplate*



Once the commissioning work has been completed, enter the following data and always specify this additional information concerning the valve type, pressure and flow ratios, whenever you consult or have reason to question the manufacture or supplier:

Year of manufacture: ..... DN: ..... NP: .....

Serial number: .....

# CONTENTS

|                                                                          |           |
|--------------------------------------------------------------------------|-----------|
| <b>A. DESCRIPTION</b>                                                    | <b>2</b>  |
| 1. FUNCTION                                                              | 2         |
| 2. GENERAL SAFETY GUIDELINES                                             | 2         |
| 3. RECOMMENDED INSTALLATION                                              | 3         |
| <b>B. COMMISSIONING</b>                                                  | <b>4</b>  |
| 1. FUNCTIONAL DIAGRAM (1400)                                             | 4         |
| 2. PREPARATION                                                           | 4         |
| 3. VENTING                                                               | 5         |
| 4. ADJUSTMENTS SUSTAINABLE PRESSURE                                      | 5         |
| 5. SETTING THE REACTION SPEED                                            | 6         |
| 6. CHECKING FOR LEAKAGES                                                 | 6         |
| <b>C. FAULT FINDING</b>                                                  | <b>7</b>  |
| <b>D. PUTTING OUT OF SERVICE AND MAINTENANCE</b>                         | <b>8</b>  |
| 1. PUTTING OUT OF SERVICE                                                | 8         |
| 2. MAINTENANCE AND SERVICE                                               | 8         |
| 2.1 GENERAL                                                              | 8         |
| 2.2 ANNUAL CHECKS                                                        | 8         |
| 2.3 FOUR OR FIVE YEARLY MAINTENANCE                                      | 9         |
| 3. REPAIR KITS AND SPARE PARTS                                           | 10        |
| 3.1 MAIN VALVE WITH STAINLESS STEEL CONNECTION ND 40 TO ND 200 (DRAWING) | 11        |
| 3.2 MAIN VALVE (PARTS LIST)                                              | 12        |
| 3.3 CONTROL VALVE, PRESSURE SUSTAINING INOX (DRAWING)                    | 14        |
| 3.4 CONTROL VALVE, PRESSURE SUSTAINING INOX (PARTS LIST)                 | 15        |
| 3.5 CONTROL LINE AND ACCESSORIES                                         | 16        |
| 3.6 POSITION INDICATOR (DRAWING)                                         | 21        |
| 3.7 POSITION INDICATOR (PARTS LIST)                                      | 22        |
| <b>E. ANNEX</b>                                                          | <b>23</b> |
| 1. TORQUE TABLE                                                          | 23        |
| <b>F. HAWLE IN EUROPE</b>                                                | <b>24</b> |

## A. Description

### 1. Function

The pressure relief valve maintains a pre-set inlet pressure ( $p_1$ ) constant. Any excess system pressure is relieved by fast opening of the valve. The closing procedure is slow in order to avoid shock pressure loads. Variable flow rates have no effect on the maintained pressure which is regulated by the control valve. The overpressure or maintained pressure of the standard version can be set within the range of 1.5 bar to 12 bar.

#### **Technical features:**

|                      |                                                                                             |
|----------------------|---------------------------------------------------------------------------------------------|
| Medium:              | Drinking water                                                                              |
| Pressure stages:     | PN 10 (Standard DN 200 and upwards)<br>PN 16 (Standard up to and including DN 150)<br>PN 25 |
| Flanges:             | Connection dimensions acc. DIN EN 1092 – 2                                                  |
| Manometer:           | EN 837-1, accuracy class 1.6                                                                |
| Main valve material: | EN-GJS-400-15                                                                               |
| Temperature range:   | 2 to 40° C                                                                                  |

### 2. General safety guidelines

The Hawle HAWIDO regulating valve is designed for use in drinking water supply systems. Please consult the manufacturer before using it with other media.

Material damage or injury to persons can occur if the HAWIDO is not installed, commissioned, operated or maintained according to these instructions or to codes of practice.

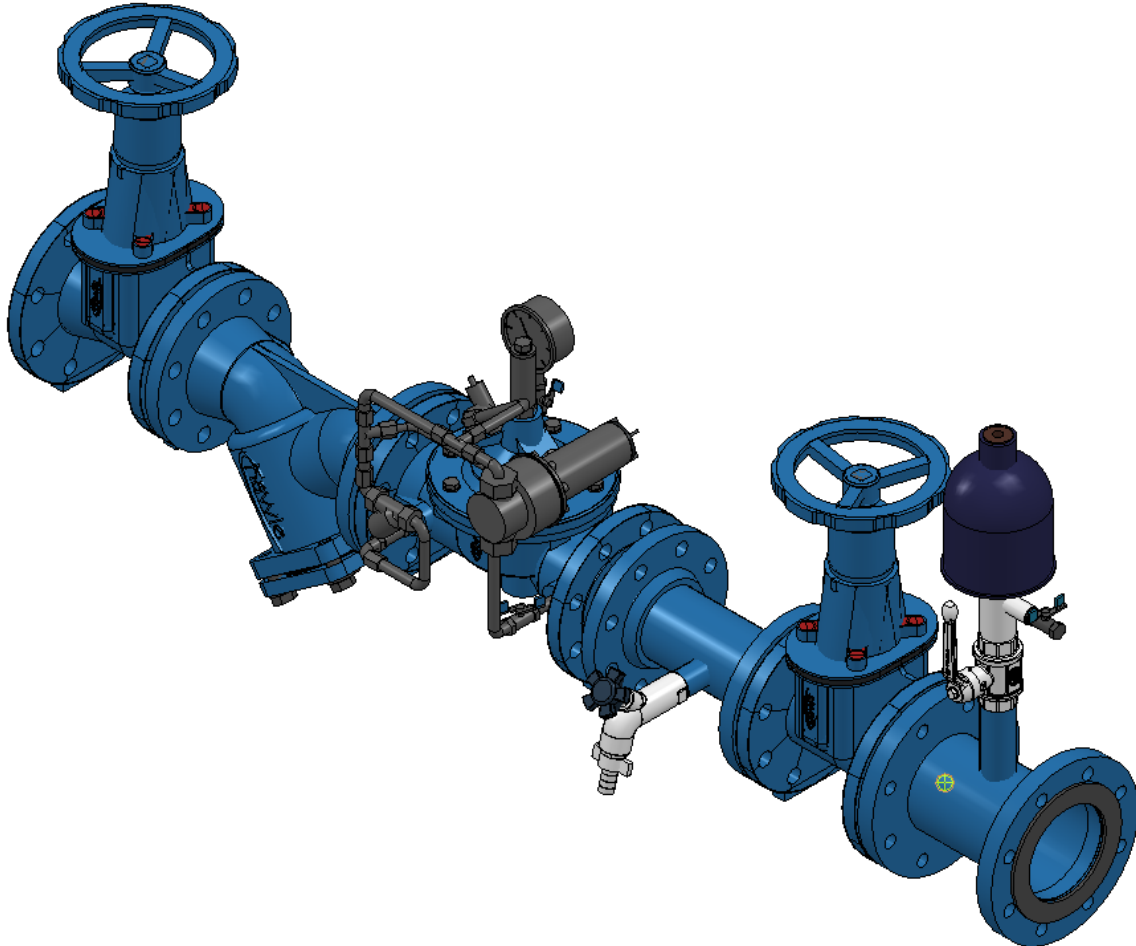
As a precondition, it is assumed that all technical regulations (e.g. SVGW, ÖVGW, DVGW...), codes of practice (e.g. VDE, VDI ...), laws and standards are understood, and will be adhered to and applied.

Work on electrical installations (e.g. installation of magnetic position switches, solenoid valves, etc.) may only be carried out by personnel authorised to carry out this work.

The responsibility for layout, installation position and commissioning of the fittings in the pipe work lies with the designer, installer and/or user. Design or installation errors can adversely affect the operation of the regulating valve and can create a significant risk. If in doubt, please consult us.

### 3. Recommended installation

Before the installation, all pipe work must be blown or flushed through to prevent any foreign material such as pieces of wood, stone etc. from entering the valve.

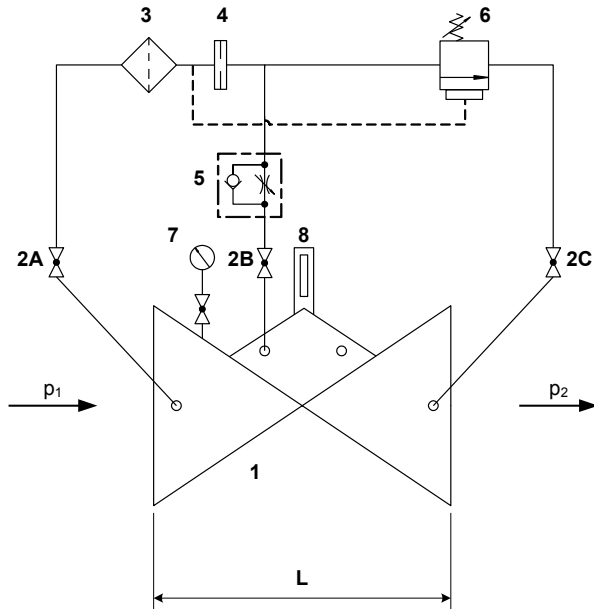


Regulating valves are normally fitted with the valve cover upwards. It is recommended that shut-off valves be fitted on both sides plus a dirt trap on the inlet side. Depending on the installation situation, a mounting adapter may also be required. If the HAWIDO 1400 is used as a relief valve, the shutoff gate valve on the outlet side can be omitted. Before commissioning, a check should be made that no coarse foreign bodies can penetrate into the HAWIDO.

For other types of installation, please contact us for advice.

## B. Commissioning

### 1. Functional diagram (1400)



#### Components:

- |   |                                          |
|---|------------------------------------------|
| 1 | Main valve 1200                          |
| 2 | Ball valve (A, B, C)                     |
| 3 | Filter                                   |
| 4 | Orifice                                  |
| 5 | One-way flow restrictor                  |
| 6 | Control valve                            |
| 7 | Pressure gauge                           |
| 8 | Position indicator                       |
|   | Electrical position indicator (optional) |
|   | Valve opening limiter (optional)         |

### 2. Preparation

Before commissioning the valve, check that the gate valves on the inlet and outlet sides of the valve are closed and that the flange connections are correctly tightened and sealed.

#### On the main valve:

- Open the ball valves (2A, 2B)
- Loosen the lock nut on the one-way flow restrictor (5) and unscrew the adjusting screw by approx-10 turns. (The path to the control chamber is completely open).
- Close the ball valve (2C)
- Loosen the headless screw in the central plug on the position indicator.
- Loosen the headless screw in the male adaptor elbow union with venting

headless screw

vent hole



- Tip over the adjusting lever on control valve (6) and turn the lever clockwise until a very strong resistance is felt from the spring.

### 3. Venting

**Proceed as follows:**

Slowly open the inlet gate valve until water flows into the valve. The valve fills with water and the air escapes via the vent holes. When the valve venting procedure has caused all the air to be expelled from the control lines, retighten the headless screws. Check that all fittings are sealing properly and tighten if necessary.

Open the inlet valve slowly and completely.

**Check:**

When the outlet gate valve is opened slightly the valve should close and remain shut. Then close the gate valve again.

If the valve does not close, the commissioning procedure must be repeated from the preceding chapter onwards. Special care must be taken here to ensure that the upper valve chamber and control lines are properly vented.

### 4. Adjustments Sustainable Pressure

The valve is prepared according to the preceding chapter. The valve is open on the inlet side and closed on the outlet side.

**Proceed as follows:**

- **Slowly** open ball valve (2C). The valve then opens and fills the pipe work on the outlet side until a pressure of 0.4 bar is reached. The valve then closes again.
- **Gradually and slowly** open the gate valve on the outlet side.
- Slowly turn the adjusting lever of the control valve (6) counter-clockwise until the valve opens (audible sound of water flow).
- Check the inlet pressure on the pressure gauge.
- Step by step tighten the hand wheel of the control valve (6) ( $\frac{1}{2}$  turn) according the table below.

**Note:**

Pause between each half turn of the adjusting lever until the hydraulic system has stabilised. Check the pressure on the pressure gauge on the inlet side.

If the required relief or sustaining pressure has been set, tip over the adjusting lever for fixing.

| Spring   | Mark   | Regulating pressure | Pressure change at 1 turn [bar] | Number of spindel turns for $\Delta p = 1\text{bar}$ |
|----------|--------|---------------------|---------------------------------|------------------------------------------------------|
| Standard | None   | 1.5 - 12bar         | 0.4                             | 2.5                                                  |
| Strong   | Yellow | 10 - 22bar          | 0.9                             | 1.1                                                  |
| Light    | Blue   | 0.08 – 5bar         | 0.08                            | 12.6                                                 |

## 5. Setting the reaction speed

If the HAWIDO does not operate quietly, or pressure surges occur in the supply network, this can be corrected by adjustment one-way flow restrictor (5).

**Procedure:**

Loosen the locknut. Screw in the setting screw clockwise with a screwdriver until the valve operates quietly, and then retighten the lock nut.

**Attention:**

The setting screw must always remain open by at least 3 - 5 turns; otherwise the valve will not reopen sufficiently quickly after the closing sequence. A special setting may be required for very high inlet pressures.

## 6. Checking for leakages

HAWIDOS are tested for both leakage and functionality during manufacture. When checking for leakage under operational conditions, particular attention must therefore be given to the seals of the flange connections, the control lines and the central screw plug on the valve cover, and these must be further tightened if necessary.

## C. Fault finding

| Symptoms                                   | Possible cause                             | Action                                                                                                                                       |
|--------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Valve does not open                        | One-way flow restrictor blocked            | Replace or unscrew the set screw several times until the valve functions properly                                                            |
|                                            | One-way flow restrictor closed too far     | Loosen the grub screw until the valve functions properly                                                                                     |
| Valve does not close                       | One-way flow restrictor blocked            | Replace or screw the grub set fully in and out several times, and then reset                                                                 |
|                                            | Filter in control circuit blocked          | Clean the filter                                                                                                                             |
|                                            | Air in the control lines or valve chamber  | Vent system                                                                                                                                  |
|                                            | Foreign matter in the main valve           | Carry out a service, and remove any foreign matter                                                                                           |
|                                            | Diaphragm defective                        | Carry out a service, and replace the diaphragm                                                                                               |
|                                            | Valve spindle jammed by encrustation       | Carry out service, and remove any encrustation                                                                                               |
| Loud noises                                | Unsatisfactory operational conditions      | Change pressure conditions by 0.1 to 0.2 bar. Slightly open or close the one-way flow restrictor. Contact Hawle customer service department. |
|                                            | Wrong valve diameter                       | Calculate correct valve diameter. (If necessary contact Hawle)                                                                               |
| Erratic operation                          | One-way flow restrictor incorrectly set    | Reset (according to Chapter: <i>Resetting the reaction speed</i> )                                                                           |
| Original pressure values no longer reached | Pressure gauge faulty                      | Check or replace pressure gauge                                                                                                              |
|                                            | Changed operating conditions               | Reset accordingly (see Chapter: <i>Recommended installation</i> )                                                                            |
| Epoxy-coating damaged                      | Transportation damage, installation damage | Repair using Hawle two-component repair kit for coatings                                                                                     |

## D. Putting out of service and Maintenance

### 1. Putting out of service

The operating valve must first be hydraulically shut off as follows:

- **Slowly** close the gate valves after and before the valve
- **Slowly** close the ball valves (2A, 2B, 2C)

The valve is taken out of operation and the maintenance can be accomplished.

### 2. Maintenance and Service

#### 2.1 General

Our long experience with diaphragm valves that are controlled by the flow medium indicates that our HAWIDO's normally function trouble-free for many years. Regular maintenance is, however, necessary to ensure continued reliable operation.

Under normal operating conditions, the following should be carried out:

- Once a year, the valve should be checked for correct operation (function check)
- Once a year, the filters upstream of the valve and in the control lines should be cleaned
- Every four or five years, the inner working components should be checked, and worn parts replaced (maintenance).

Under unusual operating conditions (e.g., with water that contains quantities of suspended matter, high pressure reduction, small flow rates etc.,) maintenance should be carried out more frequently.

#### ***Maintenance label***

|                                          |              |             |
|------------------------------------------|--------------|-------------|
| Funktionskontrolle: <b>jährlich</b>      | Wartung:     | <b>20xx</b> |
| Contrôle fonctionnel: <b>annuel</b>      | Maintenance: |             |
| Prova di funzionamento: <b>ogni anno</b> | Mantenzione: |             |
| Function check: <b>annually</b>          | Maintenance: |             |

xx stands for the year.

#### 2.2 Annual checks

##### **Cleaning the strainer in the main supply**

- Unscrew the lid
- Clean the filter with a brush or cloth, or replace it
- Refit the filter and screw the lid back on

##### **Cleaning the filter in the control line**

- Unscrew the lid of the filter
- Clean the filter with a brush or cloth, or replace it
- Refit the filter mesh and screw the filter lid back on

### Checking the valve

- Remove the position indicator from valve cover.
- Check that the valve spindle moves easily by raising and lowering it with the threaded rod.
- Install the optical position indicator.

### Putting the valve back into service

- see chapter *Commissioning*

### Checking the operation of the valve

The pressure-sustaining valve has to be set eventually in such a way for the check that the inlet pressure permits the opening of the valve (see also the Chapter: *Commissioning*).

- Close the ball valve (2C) **slowly**; Valve must close.
- Open the ball valve (2C) **slowly**; Valve must open.

## 2.3 Four or five yearly maintenance

### Cleaning the strainer in the main supply

- Unscrew the lid
- Clean the filter with a brush or cloth, or replace it
- Refit the filter and screw the lid back on

### Cleaning the filter in the control line

- Unscrew the lid of the filter
- Clean the filter with a brush or cloth, or replace it
- Refit the filter mesh and screw the filter lid back on

### Main valve (see chapter: *Repair kits and spare parts*)

- Undo the fittings of the control line and lay the complete control line aside.
- Disassemble the Optical Position Indicator and replace the gaskets
- Undo the screws of the valve cover and remove this valve cover.
- Visually inspect all inner components for wear, dirt and scaling
- Clean inner components, seat and inner surfaces including the valve cover
- Disassembly the spindle guide at the housing, rinse the housing interior.  
For valves from DN 40 to DN 100 built in 2012 and DN 125 to DN 200 built in 2014, the spindle guide has to be removed from inside of the housing. The guiding thread of the spindle and the base valve must be **extremely clean**. Grease the thread well (eg Food Grease Aqua, Item No. 5292, see chapter control line parts and accessories).
- Replace the diaphragm, the O-ring and if necessary also the seat seal
- Thinly grease the area around the spindle guide with an agent, which is suitable for contact with foodstuffs. Check for easy movement of the spindle in the housing guide and in the cover guide.
- Assemble the main valve (See torque table in Annex). During assembly the easy movement of the spindle must be checked **several times** by actuating the threaded rod.

### Disassembling the control valve (see chapter: *Repair kits and spare parts*)

- Tip over the adjusting lever
- Turn the lever counter-clockwise until no resistance from the spring can be felt
- Remove housing screw
- Replace the diaphragm, the O-ring and if necessary also the seat seal
- Visually inspect the inner surfaces of the housing and clean if necessary, including the cover
- Assemble the control valve (See torque table in Annex).

#### Checking the operation of the one-way flow restrictor

- Undo the locknut
- Screw in the set screw and then unscrew it as far as it goes
- Screw in again a few turns. This process must be easy and with little resistance

#### Putting the valve back into service

- see chapter *Commissioning*

#### Checking the operation of the valve

The pressure-sustaining valve has to be set eventually in such a way for the check that the inlet pressure permits the opening of the valve (see also the Chapter: *Commissioning*).

- Close the ball valve (2C) **slowly**; Valve must close.
- Open the ball valve (2C) **slowly**; Valve must open.

### 3. Repair kits and spare parts

Several spare parts are required for the four or five yearly maintenance. These can be obtained as a repair kit for:

- the main valve
- for the control valve
- for the control circuit
- optical position indicator

The article numbers are shown in the parts lists and spare parts lists.

#### **Attention:**

When ordering spare parts, always specify the valve type, serial number and year of manufacture.

#### **Important:**

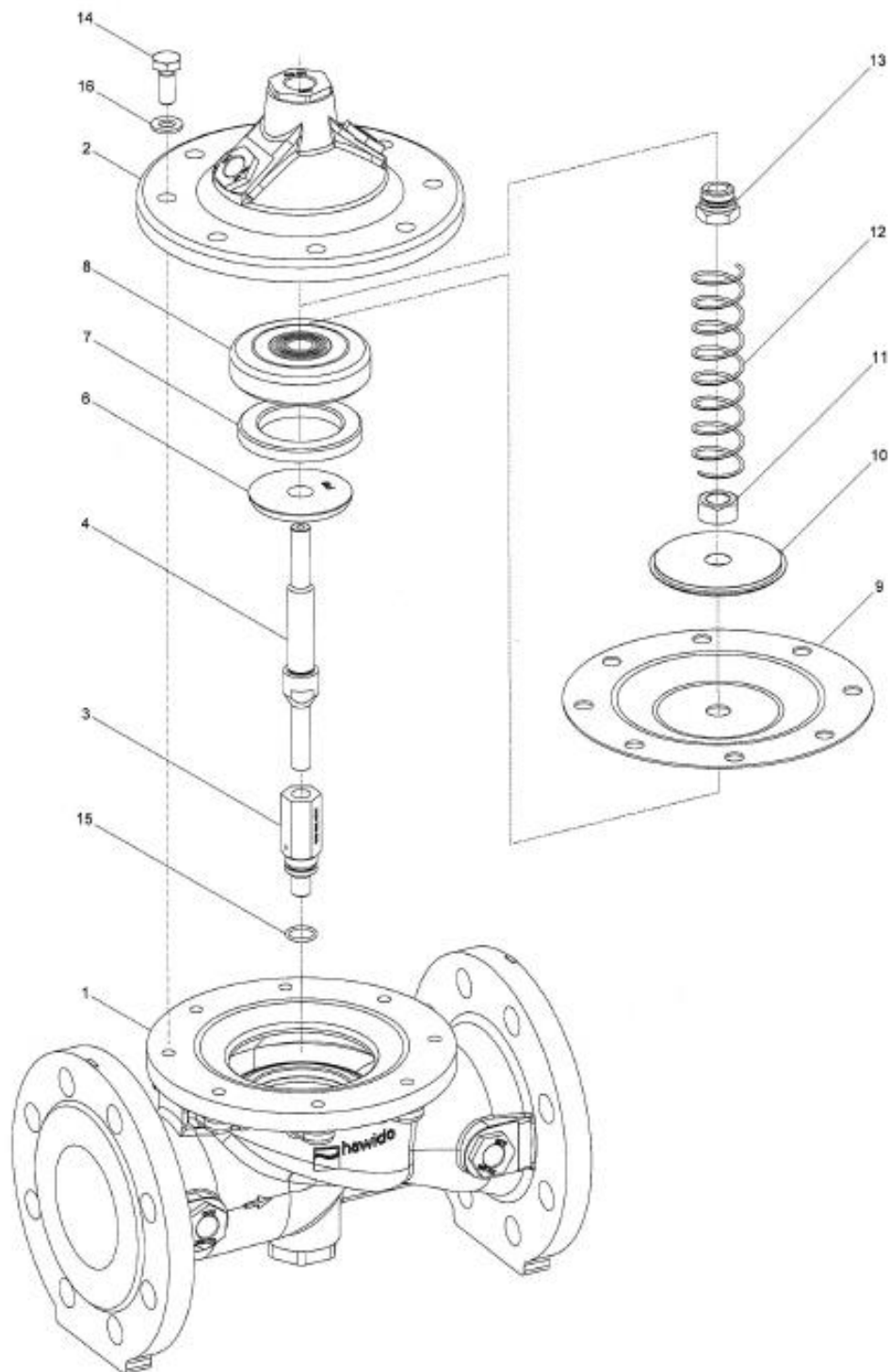
Spare parts of EPDM (membranes, seals) and NBR (O rings) have to be stored in a dark place, protected from UV radiation!

Durability in dark storage:

EPDM: eight years after production

NBR: five years after production

### 3.1 Main valve with stainless steel connection ND 40 to ND 200 (drawing)



08.12.2011/plü

## 3.2 Main valve (Parts list)

| Item. | Description                                                                             | Material | Article number |              |              |              |              |
|-------|-----------------------------------------------------------------------------------------|----------|----------------|--------------|--------------|--------------|--------------|
|       |                                                                                         |          | DN 40          | DN 50        | DN 65        | DN 80        | DN 100       |
| 1     | Body                                                                                    | GGG 40   | 1004 040 000   | 1004 050 000 | 1004 065 000 | 1004 080 000 | 1004 100 000 |
| 2     | Valve cover                                                                             | GGG 40   | 1014 050 000   | 1014 050 000 | 1014 065 000 | 1014 080 000 | 1014 100 000 |
| 3     | Spindle guide cover                                                                     | INOX     | 1024 900 000   | 1024 900 001 | 1024 900 002 | 1024 900 003 | 1024 900 004 |
| 4     | Spindle                                                                                 | INOX     | 1026 050 000   | 1026 050 000 | 1026 065 000 | 1026 080 000 | 1026 100 000 |
| 5     | Seat                                                                                    | INOX     | *              | *            | *            | *            | *            |
| 6     | Counter seat                                                                            | INOX     | 1044 040 001   | 1044 050 001 | 1044 065 001 | 1044 080 001 | 1044 100 001 |
| 7     | Seal                                                                                    | EPDM     | 1022 040 000   | 1022 050 000 | 1022 065 000 | 1022 080 000 | 1022 100 000 |
| 8     | Seal carrier                                                                            | INOX     | 1027 040 200   | 1027 050 200 | 1027 065 200 | 1027 080 200 | 1027 100 200 |
| 9     | Diaphragm PN10/16                                                                       | EPDM     | 1020 050 000   | 1020 050 000 | 1020 065 000 | 1020 080 000 | 1020 100 000 |
|       | Diaphragm PN25                                                                          | EPDM     | 1020 050 000   | 1020 050 000 | 1021 065 000 | 1021 080 000 | 1021 100 000 |
| 10    | Pressure disc                                                                           | INOX     | 1047 050 000   | 1047 050 000 | 1047 065 000 | 1047 080 000 | 1047 100 000 |
| 11    | Nut                                                                                     | INOX     | 0007 710 080   | 0007 710 080 | 0007 712 080 | 0007 716 080 | 0007 716 080 |
| 12    | Spring                                                                                  | INOX     | 1049 050 000   | 1049 050 000 | 1049 065 000 | 1049 080 000 | 1049 100 000 |
|       | Spring for valves installed upright position                                            | INOX     | 1050 050 000   | 1050 050 000 | 1050 065 000 | 1050 080 000 | 1050 100 000 |
| 13    | Spindle guide cover                                                                     | INOX     | 1042 900 000   | 1042 900 000 | 1042 900 001 | 1042 900 002 | 1042 900 002 |
| 14    | Hexagonal screw                                                                         | INOX     | 0006 608 020   | 0006 608 020 | 0006 610 025 | 0006 610 025 | 0006 612 025 |
| 15    | O-ring                                                                                  | NBR      | 0180 012 020   | 0180 012 020 | 0180 012 020 | 0180 016 020 | 0180 016 020 |
| 16    | Washer                                                                                  | INOX     | 0008 208 000   | 0008 208 000 | 0008 210 000 | 0008 210 000 | 0008 212 000 |
| 17    | GSK-sticker                                                                             |          | 1099 900 000   | 1099 900 000 | 1099 900 000 | 1099 900 000 | 1099 900 000 |
| 18    | Maintenance sticker                                                                     |          | 9691 0xx 000   | 9691 0xx 000 | 9691 0xx 000 | 9691 0xx 000 | 9691 0xx 000 |
|       | Main valve complete                                                                     | PN10/16  | 1201 040 000   | 1201 050 000 | 1201 065 000 | 1201 080 000 | 1201 100 000 |
|       | Main valve complete                                                                     | PN25     | --             | --           | 1201 065 025 | 1201 080 025 | 1201 100 025 |
|       | Repair kit for main valve with stainless steel connection, comprising item 7, 9, 15, 18 | PN10/16  | 1080 040 000   | 1080 050 000 | 1080 065 000 | 1080 080 000 | 1080 100 000 |
|       |                                                                                         | PN25     | 1080 040 000   | 1080 050 000 | 1081 065 000 | 1081 080 000 | 1081 100 000 |

| Item | Description                                                                             | Material | Article number |              |              |              |
|------|-----------------------------------------------------------------------------------------|----------|----------------|--------------|--------------|--------------|
|      |                                                                                         |          | DN 125         | DN 150       | DN 200°      | DN 200^      |
| 1    | Body                                                                                    | GGG 40   | 1004 125 000   | 1004 151 000 | 1004 200 000 | 1004 200 016 |
| 2    | Valve cover                                                                             | GGG 40   | 1014 125 000   | 1014 151 000 | 1014 200 000 | 1014 200 000 |
| 3    | Spindle guide cover                                                                     | INOX     | 1024 900 005   | 1024 900 005 | 1024 900 006 | 1024 900 006 |
| 4    | Spindle                                                                                 | INOX     | 1026 125 000   | 1026 151 000 | 1026 200 000 | 1026 200 000 |
| 5    | Seat                                                                                    | INOX     | *              | *            | *            | *            |
| 6    | Counter seat                                                                            | INOX     | 1044 125 001   | 1044 150 001 | 1044 200 001 | 1044 200 001 |
| 7    | Seal                                                                                    | EPDM     | 1022 125 150   | 1022 151 000 | 1022 200 000 | 1022 200 000 |
| 8    | Seal carrier                                                                            | INOX     | 1027 125 200   | 1027 151 200 | 1027 200 200 | 1027 200 200 |
| 9    | Diaphragm PN10/16                                                                       | EPDM     | 1020 125 150   | 1020 151 000 | 1020 200 000 | 1020 200 000 |
|      | Diaphragm PN25                                                                          | CR       | 1051 125 150   | 1051 151 000 | --           | 1034 200 000 |
| 10   | Pressure disc                                                                           | INOX     | 1047 125 150   | 1047 151 000 | 1047 200 000 | 1047 200 000 |
| 11   | Nut                                                                                     | INOX     | 0007 720 080   | 0007 720 080 | 0007 724 080 | 0007 724 080 |
| 12   | Spring                                                                                  | INOX     | 1049 125 150   | 1049 151 150 | 1049 200 000 | 1049 200 000 |
|      | Spring for valves installed upright position                                            | INOX     | 1050 125 150   | 1050 151 000 | 1050 200 000 | 1050 200 000 |
| 13   | Spindle guide cover                                                                     | INOX     | 1042 900 003   | 1042 900 003 | 1042 900 004 | 1042 900 004 |
| 14   | Hexagonal screw                                                                         | INOX     | 0006 616 035   | 0006 616 035 | 0006 620 045 | 0006 620 045 |
| 15   | O-ring                                                                                  | NBR      | 0180 018 020   | 0180 018 020 | 0180 021 020 | 0180 021 020 |
| 16   | Washer                                                                                  | INOX     | 0008 216 000   | 0008 216 000 | 0008 220 000 | 0008 220 000 |
| 17   | GSK-sticker                                                                             |          | 1099 900 000   | 1099 900 000 | 1099 900 000 | 1099 900 000 |
| 18   | Maintenance sticker                                                                     |          | 9691 0xx 000   | 9691 0xx 000 | 9691 0xx 000 | 9691 0xx 000 |
| 21   | Retaining bracket                                                                       | INOX     | --             | --           | 1200 900 020 | 1200 900 020 |
|      | Main valve complete                                                                     | PN10/16  | 1201 125 000   | 1201 151 000 | 1201 200 000 | 1201 200 016 |
|      | Main valve complete                                                                     | PN25     | 1201 125 025   | 1201 151 025 |              | 1201 200 025 |
|      | Repair kit for main valve with stainless steel connection, comprising item 7, 9, 15, 18 | PN10/16  | 1080 125 150   | 1080 151 000 | 1080 200 000 | 1080 200 000 |
|      |                                                                                         | PN25     | 1081 125 150   | 1081 151 000 |              | 1081 200 000 |

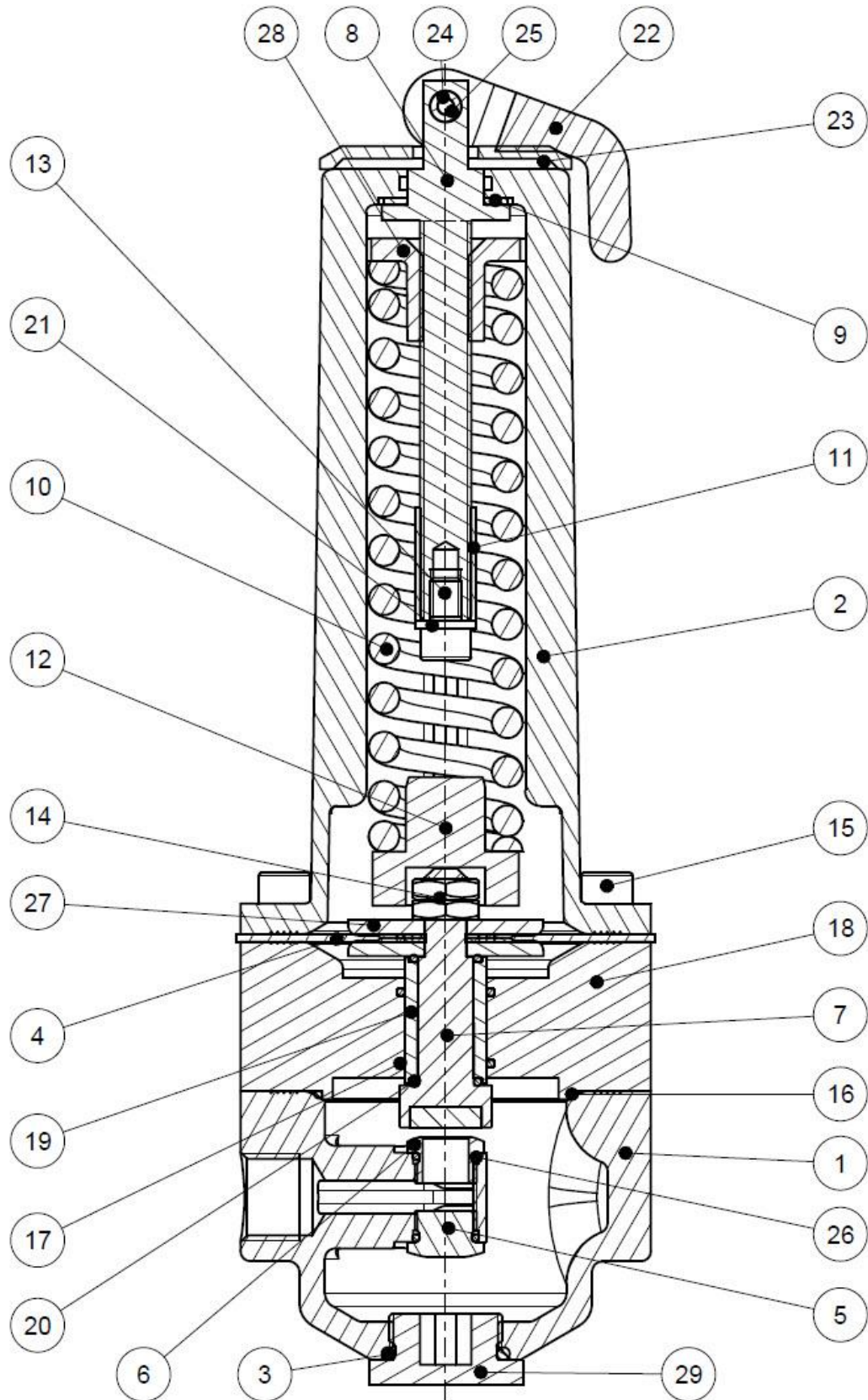
° PN10

^ PN16

\* not interchangeable

16.03.2018/plü

### 3.3 Control valve, pressure sustaining INOX (drawing)



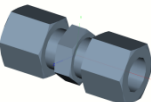
05.09.2017/plü

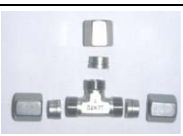
### 3.4 Control valve, pressure sustaining INOX (parts list)

| Item                     | Description                                               | Material     | Article number |
|--------------------------|-----------------------------------------------------------|--------------|----------------|
| 1                        | Control housing                                           | INOX         | 1100 200 000   |
| 2                        | Socket                                                    | INOX         | 1108 200 000   |
| 3                        | O-Ring                                                    | NBR70        | 0180 020 025   |
| 4                        | Diaphragm DN3/8"                                          | EPDM (W270)  | 1121 000 000   |
| 5                        | Seat Compact Form 1.0, blind                              | INOX         | 1117 200 000   |
| 6                        | Seat Compact Form 1.0, 9 mm                               | INOX         | 1117 200 002   |
| 7                        | Sealing plate DAV                                         | INOX/EPDM    | 1120 200 001   |
| 8                        | Pressure screw                                            | INOX         | 1133 200 000   |
| 9                        | Fibre seal                                                | Fibre        | 0132 024 015   |
| 10                       | Compression spring standard                               | INOX         | 1145 200 000   |
| 11                       | Spacer sleeve to spring                                   | INOX         | 1133 300 000   |
| 12                       | Spring guide                                              | INOX         | 1133 400 000   |
| 13                       | Cylinder screw M6 x 10                                    | INOX         | 0004 506 010   |
| 14                       | Hexagonal nut M8 x 0.5d                                   | INOX         | 0007 208 050   |
| 15                       | Cylinder screw M6 x 45                                    | INOX         | 0004 506 045   |
| 16                       | O-Ring                                                    | NBR70        | 0180 048 015   |
| 17                       | O-Ring                                                    | NBR70        | 0180 016 015   |
| 18                       | Intermediate casing                                       | INOX         | 1115 016 030   |
| 19                       | Sleeve for axe long                                       | Stanal 32    | 1140 500 000   |
| 20                       | O-Ring                                                    | NBR70        | 0180 011 015   |
| 21                       | Washer                                                    | INOX         | 0008 206 000   |
| 22                       | Clamping and adjusting lever                              | Kst – PA6.6  | 1135 000 001   |
| 23                       | Load washer                                               | Kst – PA6.6  | 1135 000 010   |
| 24                       | Axis with female thread                                   | INOX         | 1135 000 011   |
| 25                       | Cylinder screw M4 x 16                                    | INOX         | 0004 804 016   |
| 26                       | O-Ring                                                    | EPDM         | 0180 010 015   |
| 27                       | Pressure washer DN 3/8"                                   | INOX         | 1129 012 000   |
| 28                       | Screw-down nut                                            | Rg           | 1134 000 010   |
| 29                       | Guiding pin                                               | INOX         | 1137 000 000   |
| <b>REGULATION RANGE:</b> |                                                           |              |                |
|                          | Entire control valve (standard spring)                    | 1.5 – 12 bar | 1920 001 000   |
|                          | Entire control valve (blue flag)                          | 0.2 – 5 bar  | 1920 001 001   |
|                          | Entire control valve (yellow flag)                        | 10 – 22 bar  | 1900 001 002   |
|                          | Repair kit comprising item:<br>3, 4, 7, 9, 16, 17, 20, 26 |              | 1181 000 001   |

05.09.2017/plü

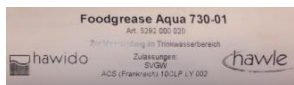
### 3.5 Control line and accessories

| <b>Masternumber<br/>Description</b>                 | <b>Picture</b>                                                                      | <b>Size<br/>more sizes might be available</b>                                                                                                                                                                                                                                                | <b>Art. number</b>                                                                                                                           |
|-----------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>0130<br/>Composite sealing<br/>ring</b>          |    | stainless steel /NBR 3/8"<br>stainless steel /NBR 1/2"<br>stainless steel /NBR 3/4"<br>steel/NBR 1"                                                                                                                                                                                          | 0130 012 000<br>0130 016 000<br>0130 025 000<br>0130 032 000                                                                                 |
| <b>0273<br/>Single component</b>                    |    | Fitting attachment (consisting of<br>connecting nut and clamping ring)<br>DN 12 stainless steel                                                                                                                                                                                              | 0273 012 000                                                                                                                                 |
| <b>0275<br/>Support sleeve</b>                      |    | stainless steel d4 – 6<br>stainless steel d12 – 9<br>stainless steel d12 – 10                                                                                                                                                                                                                | 0275 006 004<br>0275 012 009<br>0275 012 010                                                                                                 |
| <b>0283<br/>Clamping ring</b>                       |    | d6 stainless steel<br>d12 stainless steel<br>d18 stainless steel<br>d8 - 6 stainless steel                                                                                                                                                                                                   | 0283 006 000<br>0283 012 000<br>0283 018 000<br>0283 008 006                                                                                 |
| <b>0284<br/>Orifice</b>                             |   | d12 stainless steel Ø 0.6 mm<br>d12 stainless steel Ø 0.9 mm<br>d12 stainless steel Ø 1.2 mm<br>d12 stainless steel Ø 1.5 mm<br>d12 stainless steel Ø 1.9 mm<br>d12 stainless steel Ø 2.4 mm<br>d12 stainless steel Ø 3.1 mm<br>d18 stainless steel Ø 3.5 mm<br>d18 stainless steel Ø 4.0 mm | 0284 006 000<br>0284 009 000<br>0284 012 000<br>0284 015 000<br>0284 019 000<br>0284 024 000<br>0284 031 000<br>0284 035 010<br>0284 040 010 |
| <b>0311<br/>Male adaptor union</b>                  |  | d 12 - 3/8" stainless steel<br>d 12 - 1/2" stainless steel<br>d 6 - 1/8" stainless steel<br>d 6 - 1/4" stainless steel<br>d 6 - 3/8" stainless steel<br>d18 – 1/2" stainless steel                                                                                                           | 0311 012 012<br>0311 012 016<br>0311 006 004<br>0311 006 008<br>0311 006 012<br>0311 018 016                                                 |
| <b>0323<br/>Straight union</b>                      |  | DN 6 stainless steel<br>DN 12 stainless steel                                                                                                                                                                                                                                                | 0323 006 000<br>0323 012 000                                                                                                                 |
| <b>0324<br/>Straight screw-on<br/>screw fitting</b> |  | d12 - 3/8" stainless steel                                                                                                                                                                                                                                                                   | 0324 012 012                                                                                                                                 |
| <b>0351<br/>Reduction union</b>                     |  | d6 - d12 stainless steel                                                                                                                                                                                                                                                                     | 0351 012 006                                                                                                                                 |
| <b>0361<br/>Female adaptor</b>                      |  | d 10 - 3/8" stainless steel<br>d 12 - 3/8" stainless steel<br>d 12 - 1/2" stainless steel<br>d 18 – 1/2" stainless steel                                                                                                                                                                     | 0361 010 012<br>0361 012 012<br>0361 012 016<br>0361 018 016                                                                                 |
| <b>0371<br/>Male adaptor</b>                        |  | DN 12 - 3/8" stainless steel                                                                                                                                                                                                                                                                 | 0371 012 012                                                                                                                                 |

|                                                           |                                                                                     |                                                                                                                                              |                                                                              |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <b>0401<br/>Sleeve</b>                                    |    | 3/8" stainless steel<br>1/2" stainless steel<br>3/4" stainless steel<br>1" stainless steel                                                   | 0401 012 000<br>0401 016 000<br>0401 025 000<br>0401 032 000                 |
| <b>0411<br/>Adjustable male<br/>adaptor</b>               |    | DN 6 - 1/8" stainless steel<br>DN12 - 3/8" stainless steel                                                                                   | 0411 006 004<br>0411 012 012                                                 |
| <b>0431<br/>Male adaptor elbow<br/>union</b>              |    | DN 6 - 1/8" stainless steel<br>DN6 - 1/4" stainless steel<br>DN12 - 3/8" stainless steel<br>DN18 - 1/2" stainless steel                      | 0431 006 004<br>0431 006 008<br>0431 012 012<br>0431 018 016                 |
| <b>0431<br/>Male adaptor elbow<br/>union with venting</b> |    | DN12 - 3/8" stainless steel                                                                                                                  | 0431 012 013                                                                 |
| <b>0451<br/>Elbow union 90°</b>                           |    | DN6 stainless steel<br>DN12 stainless steel<br>DN18 stainless steel                                                                          | 0451 006 000<br>0451 012 000<br>0451 018 000                                 |
| <b>0455<br/>Female adaptor elbow<br/>union 90°</b>        |   | IG 3/8" stainless steel<br>IG 1/2" stainless steel<br>IG 3/4" stainless steel<br>IG 1" stainless steel                                       | 0455 012 000<br>0455 016 000<br>0455 025 000<br>0455 032 000                 |
| <b>0456<br/>Female adaptor elbow<br/>union 90°</b>        |  | IG 3/8" - AG 3/8" stainless steel<br>IG 1/2" - AG 1/2" stainless steel<br>IG 3/4" - AG 3/4" stainless steel<br>IG 1" - AG 1" stainless steel | 0456 012 000<br>0456 016 000<br>0456 025 000<br>0456 032 000                 |
| <b>0461<br/>T-union</b>                                   |  | d6 stainless steel<br>d12 stainless steel<br>d12 - 6 - 12 stainless steel<br>d18 stainless steel                                             | 0461 006 000<br>0461 012 000<br>0461 012 006<br>0461 018 000                 |
| <b>0510<br/>Plug</b>                                      |  | AG 3/8" konisch stainless steel<br>AG 1/2" konisch stainless steel                                                                           | 0510 012 000<br>0510 016 000                                                 |
| <b>0511<br/>Plug aeration for<br/>Hawido</b>              |  | AG 1/2" stainless steel<br>AG 3/4" stainless steel<br>AG 1" stainless steel (hexagon socket)                                                 | 0511 016 000<br>0511 025 000<br>0511 032 001                                 |
| <b>0520<br/>Hexagonal male<br/>adaptor nipple</b>         |  | d 1/8" stainless steel<br>d 1/4" stainless steel<br>d 3/8" stainless steel<br>d 1/2" stainless steel<br>d 3/4" stainless steel               | 0520 004 000<br>0520 008 000<br>0520 012 000<br>0520 016 000<br>0520 025 000 |
| <b>0541<br/>Ball valve</b>                                |  | DN 3/8" stainless steel<br>DN 1/2" stainless steel<br>DN 3/4" stainless steel                                                                | 0541 012 001<br>0541 016 000<br>0541 016 010                                 |

|                                                                    |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                       |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>0545</b><br><b>Y-filter</b>                                     |   | Y-filter stainless steel IG 3/8"<br>Single components:<br>Filter sieve stainless steel<br>Plug complete<br>Seal big for Y-filter<br>O-Ring<br><br>Y-filter stainless steel 1/2"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0545 112 002<br><br>0545 900 051<br>0545 112 010<br>0545 112 011<br>0545 112 012<br><br>0545 116 000                                                                                                  |
| <b>0549</b><br><b>One-way flow restrictor &amp; Throttle valve</b> |   | Throttle valve DN 3/8" Brass nickel-plated<br><br>Stainless steel IG 3/8" Typ B d 12 with a long spindle                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0549 000 002<br><br>0549 000 005                                                                                                                                                                      |
| <b>0570</b><br><b>Non-return valve</b>                             |   | 3/8" Brass (max. 40 bar)<br>1/2" Brass (max. 40 bar)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0570 012 045<br>0570 016 045                                                                                                                                                                          |
| <b>0600</b><br><b>Manometer</b>                                    |   | AG 3/8" 0 - 6 bar<br>AG 3/8" 0 - 10 bar<br>AG 3/8" 0 - 16 bar<br>AG 3/8" 0 - 25 bar<br>AG 3/8" 0 - 40 bar<br>AG 3/8" 0 - 60 bar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0600 012 006<br>0600 012 010<br>0600 012 016<br>0600 012 025<br>0600 012 040<br>0600 012 060                                                                                                          |
| <b>0610</b><br><b>Solenoid valves</b>                              |  | Solenoid valve normally open<br>2/2 way valve (1795/96)<br><b>122K84</b><br><br>Solenoid valve normally closed<br>2/2 way valve (1795/96)<br><b>E121K04</b><br><br>Solenoid valve normally open<br>3/2 way valve (1703 up to DN 100<br>1603, 1706 PN 16 all diameters)<br><b>132K04</b><br><br>Solenoid valve normally closed<br>3/2 way valve (1704 up to DN 100,<br>1604)<br><b>E131K04</b><br><br>Solenoid valve normally open<br>2/2 way valve (1704 DN 125 and above<br>1304, 1404, 1504)<br>(old version: E322 H73 06)<br><br>Solenoid valve normally closed<br>2/2 Wegeventil (zu 1703 ab DN 125,<br>1303, 1403, 1503, 1706 PN 25 ab DN<br>125)<br>(old version: E321 H13)<br><br>Magnetventil universel<br>3/2 way valve (1706 PN 25<br>up to DN 100)<br><br>*****<br><br>Spare part : Diaphragm for solenoid<br>type 0610 510 001 and 0610 510 002<br><br>Spare parts Kit for solenoid valve type<br>0610 510 001 | 0610 122 084<br><br><br><br>0610 121 004<br><br>0610 132 004<br><br>0610 131 004<br><br>0610 510 002<br><br>0610 510 001<br><br><br>0610 133 005<br><br>*****<br><br>0610 590 001<br><br>0610 590 002 |

|                                                        |                                                                                     |                                                                                                                                                                                                                                                                  |                                                                                                              |
|--------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>0620<br/>Coil</b>                                   |    | Coil AC voltage<br>Indicate the voltage<br><br>Coil DC voltage<br>Indicate the voltage                                                                                                                                                                           | 0620 xxx xxx<br><br>0621 xxx xxx                                                                             |
| <b>0630<br/>Appliance socket<br/>for electric coil</b> |    | Appliance socket<br>for electric coil                                                                                                                                                                                                                            | 0630 000 000                                                                                                 |
| <b>0652, 0653<br/>Plug module<br/>Type LBV</b>         |    | Plug module for solenoid valves Type<br>LBV 24 DC = 8-14S incl. 2m cable<br><br>Plug module<br>for solenoid valves<br>Type LBV 24, IP 65<br>IN: 48-230VAC/DC<br>OUT: 48VDC<br>incl. 2m cable 3-wire<br><br>For use with 48VDC coils only                         | 0653 024 008<br><br>0653 230 000                                                                             |
| <b>0670<br/>Hexagonal overcut</b>                      |    | AG 3/8" IG 1/8" stainless steel<br>AG 3/8" IG 1/4" stainless steel<br>AG 1/2" IG 3/8" stainless steel<br>AG 3/4" IG 3/8" stainless steel<br>AG 1" IG 1/8" stainless steel                                                                                        | 0670 012 004<br>0670 012 008<br>0670 016 012<br>0670 025 012<br>0670 032 012                                 |
| <b>0671<br/>Threaded connection</b>                    |   | AG 3/8" IG 1/2" stainless steel<br>AG 3/4" IG 1" stainless steel                                                                                                                                                                                                 | 0671 016 012<br>06710 32 025                                                                                 |
| <b>0680<br/>Male adaptor nipple</b>                    |  | AG 3/8" L = 30 mm stainless steel<br>AG 3/8" L = 40 mm stainless steel<br>AG 3/8" L = 50 mm stainless steel<br>AG 3/8" L = 60 mm stainless steel<br>AG 3/8" L = 70 mm stainless steel<br>AG 3/8" L = 80 mm stainless steel<br>AG 3/8" L = 110 mm stainless steel | 0680 012 030<br>0680 012 040<br>0680 012 050<br>0680 012 060<br>0680 012 070<br>0680 012 080<br>0680 012 110 |
| <b>0690<br/>Male reduction nipple</b>                  |  | AG 3/8" - 1/8" stainless steel<br>AG 3/8" - 1/4" stainless steel<br>AG 1/2" - 3/8" stainless steel<br>AG 3/4" - 3/8" stainless steel<br>AG 1" - 3/8" stainless steel                                                                                             | 0690 012 004<br>0690 012 008<br>0690 016 012<br>0690 025 012<br>0690 032 012                                 |
| <b>0711<br/>T-union</b>                                |  | IG 3/8" egal stainless steel<br>IG 1/2" egal stainless steel<br>IG 3/4" egal stainless steel<br>IG 1" egal stainless steel                                                                                                                                       | 0711 012 000<br>0711 016 000<br>0711 025 000<br>0711 032 000                                                 |
| <b>0730<br/>Seamless pipe</b>                          |  | d6 x 1mm stainless steel<br>d12 x 1.5 mm stainless steel<br>d15 x 1.5 mm stainless steel<br>d18 x 1.5 mm stainless steel                                                                                                                                         | 0730 006 010<br>0730 012 015<br>0730 015 015<br>0730 018 015                                                 |
| <b>1188<br/>Rep. Set<br/>Control line</b>              |  | From serial number 14252 (Januar 2003)<br>DN40 bis 100<br>DN125 bis 300<br><br>From serial number 25915 (Juni 2014,<br>Filter Typ B (0545 112 002)<br>DN40 bis 100<br>DN125 bis 200                                                                              | 1188 065 100<br>1188 125 300<br><br>1188 000 000<br>1188 000 001                                             |
| <b>SA.0<br/>PA-tube</b>                                |  | Tube AD 6 mm, ID 4 mm<br>Tube AD 12 mm, ID 9 mm                                                                                                                                                                                                                  | SA.0 000 060<br>SA.0 000 290                                                                                 |

| Tools and accessories                                    |                                                                                     |                                                            |                              |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------|
| <b>1199</b><br><b>Spindel stroke</b><br><b>tester</b>    |    | M5<br>M6                                                   | 1199 000 000<br>1199 000 010 |
| <b>1199</b><br><b>Tool for seal holder</b>               |    | Key for assembling the seal holder<br>of the pilot valve   | 1199 000 020                 |
| <b>1199</b><br><b>Ratchet with</b><br><b>attachment</b>  |    | Ratchet with attachment for the one<br>way flow restrictor | 1199 000 030                 |
| <b>1199</b><br><b>Ratchet with</b><br><b>attachment.</b> |   | Ratchet with attachment for the one<br>way flow restrictor | 1199 000 040                 |
| <b>5292</b><br><b>Grease</b>                             |  | Foodgrease Aqua<br>Tube à 175g                             | 5292 000 020                 |

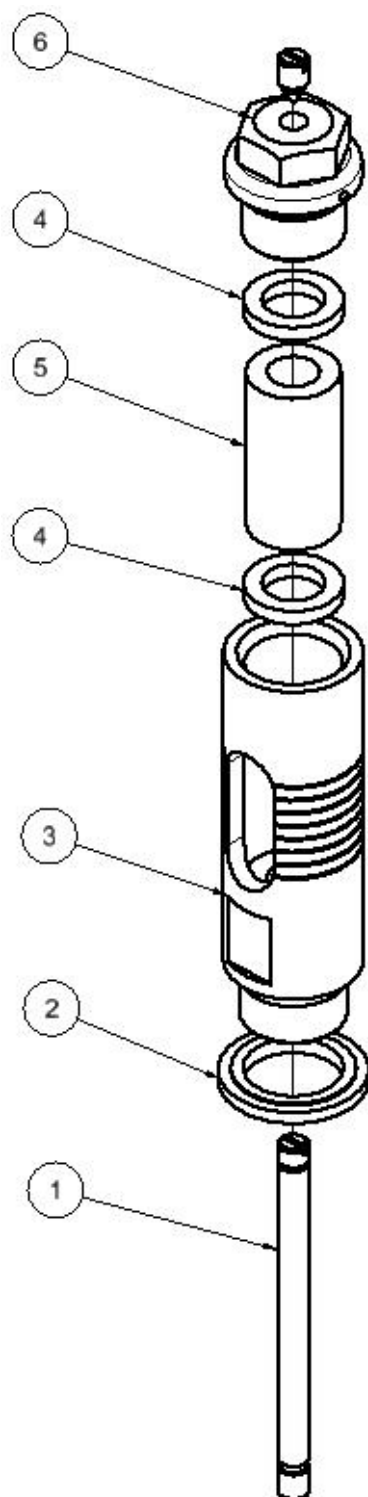
AG: Outside thread  
IG: Inside thread

AD: Outside diameter  
ID: Inside diameter

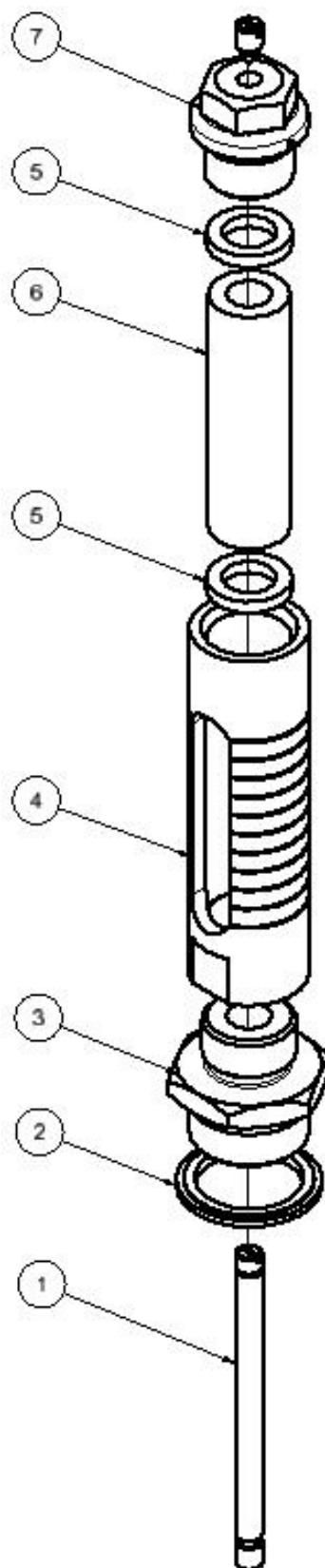
02.02.2018/plü

### 3.6 Position indicator (drawing)

DN 40 – DN 100



DN 125 – DN 300



12.03.2014/plü

### 3.7 Position indicator (Parts list)

| Item | Description                          | Material      | Article number |              |              |              |              |
|------|--------------------------------------|---------------|----------------|--------------|--------------|--------------|--------------|
|      |                                      |               | DN 40          | DN 50        | DN 65        | DN 80        | DN 100       |
| 1    | Pin                                  | Stainl. steel | 1992 000 050   | 1992 000 050 | 1992 000 080 | 1992 000 080 | 1992 000 100 |
| 2    | Seal 1/2"                            | Stainl./NBR   | 0130 016 000   | 0130 016 000 | 0130 016 000 | 0130 016 000 | 0130 016 000 |
| 3    | Housing                              | Stainl. steel | 1994 000 010   | 1994 000 010 | 1994 000 010 | 1994 000 010 | 1994 000 010 |
| 4    | Gasket                               | EPDM70        | 1992 900 030   | 1992 900 030 | 1992 900 030 | 1992 900 030 | 1992 900 030 |
| 5    | Sight tube                           | Glas          | 1993 050 100   | 1993 050 100 | 1993 050 100 | 1993 050 100 | 1993 050 100 |
| 6    | Plug 1/2"                            | Stainl. steel | 0511 016 000   | 0511 016 000 | 0511 016 000 | 0511 016 000 | 0511 016 000 |
|      | Position indicator                   |               | 1995 000 050   | 1995 000 050 | 1995 000 080 | 1995 000 080 | 1995 000 100 |
|      | Repair kit comprising items: 2 and 4 |               | 1996 000 000   | 1996 000 000 | 1996 000 000 | 1996 000 000 | 1996 000 000 |

| Item | Description                          | Material      | Article number |              |              |              |              |
|------|--------------------------------------|---------------|----------------|--------------|--------------|--------------|--------------|
|      |                                      |               | DN 125         | DN 150N      | DN 200       | DN 250       | DN 300       |
| 1    | Pin                                  | Stainl. steel | 1992 000 125   | 1992 000 150 | 1992 000 200 | 1992 000 250 | 1992 000 300 |
| 2    | Seal 3/4"                            | Stainl./NBR   | 0130 025 000   | 0130 025 000 | 0130 025 000 |              |              |
|      | Seal 1"                              | Steel/NBR     |                |              |              | 0130 032 000 | 0130 032 000 |
| 3    | Adapting nipple 3/4"                 | Stainl. steel | 1992 900 020   | 1992 900 020 | 1992 900 020 | 1992 900 020 | 1992 900 020 |
| 4    | Housing                              | Stainl. steel | 1994 000 020   | 1994 000 020 | 1994 000 020 | 1994 000 020 | 1994 000 030 |
| 5    | Gasket                               | EPDM70        | 1992 900 030   | 1992 900 030 | 1992 900 030 | 1992 900 030 | 1992 900 030 |
| 6    | Sight tube                           | Glas          | 1993 125 250   | 1993 125 250 | 1993 125 250 | 1993 125 250 | 1993 300 000 |
| 7    | Plug 1/2"                            | Stainl. steel | 0511 016 000   | 0511 016 000 | 0511 016 000 | 0511 016 000 | 0511 016 000 |
|      | Position indicator                   |               | 1995 000 125   | 1995 000 150 | 1995 000 200 | 1995 000 250 | 1995 000 300 |
|      | Repair kit comprising items: 2 and 5 |               | 1996 000 010   | 1996 000 010 | 1996 000 010 | 1996 000 020 | 1996 000 020 |

11.01.2018/plü

## E. Annex

### 1. Torque table

When assembling the main valve and the pilot valve, all bolts are checked with a torque wrench according to the following list. Grease the bolts before mounting !

| Main valve | Diameter<br>DN | Hexagon bolt<br>M | Strenght class<br><sup>1)</sup> | Tightening torque |                    |
|------------|----------------|-------------------|---------------------------------|-------------------|--------------------|
|            |                |                   |                                 | Reference         | Max. <sup>2)</sup> |
|            | 40 - 50        | M 8               | A4 / 80                         | 22 Nm             | 25 Nm              |
|            | 65 - 80        | M 10              |                                 | 47 Nm             | 50 Nm              |
|            | 100            | M 12              |                                 | 84 Nm             | 87 Nm              |
|            | 125 - 150      | M 16              |                                 | 172 Nm            | 216 Nm             |
|            | 200            | M 20              |                                 | 285 Nm            | 423 Nm             |
|            | 250            | M 20              |                                 | 285 Nm            | 423 Nm             |
|            | 300            | M 20              |                                 | 380 Nm            | 423 Nm             |

| Pilot valve | Typ              | Hexagon<br>Socket bolt | Strenght class<br>1) | Tightening torque |        |
|-------------|------------------|------------------------|----------------------|-------------------|--------|
|             |                  |                        |                      | Reference         | Max.   |
|             | DRV / DAV        | M 6                    | A2 / A4 / 70         | 8 Nm              | 8,5 Nm |
|             | MBV / RBS        |                        |                      |                   |        |
|             | Control<br>valve | Hexagon bolt<br>M      | Strenght class<br>1) | Tightening torque |        |
|             |                  |                        | Reference            | Max.              |        |
|             | NAZ              | M 6                    | A2 / A4 / 70         | 8 Nm              | 8,5 Nm |

(Torque for bolts with term in head A2)

| Main valve | Diameter<br>DN | Hexagon bolt<br>M | Strenght class<br><sup>1)</sup> | Tightening torque |        |
|------------|----------------|-------------------|---------------------------------|-------------------|--------|
|            |                |                   |                                 | Reference         | Max.   |
|            | 40 - 50        | M 8               | A2 / 70                         | 17 Nm             | 19 Nm  |
|            | 65             | M 10              |                                 | 33 Nm             | 36 Nm  |
|            | 80             | M 10              |                                 | 40 Nm             | 40 Nm  |
|            | 100            | M 12              |                                 | 70 Nm             | 72 Nm  |
|            | 125 - 150      | M 16              |                                 | 172 Nm            | 172 Nm |
|            | 200            | M 20              |                                 | 280 Nm            | 285 Nm |
|            | 250            | M 20              |                                 | 280 Nm            | 285 Nm |
|            | 300            | M 20              |                                 | 235 Nm            | 240 Nm |

Note: <sup>1)</sup> = Term on bolt head A2 – 70 or A4 – 80!

<sup>2)</sup> = Maximum permissible torque according strength analysis

Bolts according SN EN ISO 4014 und SN EN ISO 4017

Stand: FO 0065, Rev. 12 / 19.12.2017

## F. Hawle in Europe

### Addresses:

Hawle Armaturen AG  
Hawlestrasse 1  
CH-8370 Sirnach  
[www.hawle.ch](http://www.hawle.ch)

Telefon +41 (0)71 969 44 22  
Telefax +41 (0)71 969 44 11

Hawle Armaturen GmbH  
Liegnitzer Strasse 6  
D-83395 Freilassing  
[www.hawle.de](http://www.hawle.de)

Telefon +49 (0)8654 63 03 - 0  
Telefax +49 (0)8654 63 03 60

E. Hawle Armaturenwerke GmbH  
Wagrainerstr. 13  
A-4840 Vöcklabruck  
[www.hawle.at](http://www.hawle.at)

Telefon +43 (0)76 72/72 576 0  
Telefax +43 (0)76 72 78 464

Hawle Kft  
Dobogókői út 5  
H-2000 Szentendre  
[www.hawle.hu](http://www.hawle.hu)

Telefon +36 (0) 26 501 501  
Telefax +36 (0) 26 501 502

Hawle Armatury spol. s r.o.  
Ricanská 375  
CZ-25242 Jesenice u.Prahy  
[www.hawle.cz](http://www.hawle.cz)

Telefon +420 (0)2 410 03 111  
Telefax +420 (0)2 41 00 33 33

Hawle Spółka zo.o  
ul. Piaskowa 9  
PL-62-028 Koziegłowy  
[www.hawle.pl](http://www.hawle.pl)

Telefon +48 (0)61 811 14 00  
Telefax +48 (0)61 811 14 27

Hawle s.r.o.  
Pezinská c.30  
SK-903 01 Senec  
[www.hawle.sk](http://www.hawle.sk)

Telefon +421 (0)2 45 92 21 87  
Telefax +421 (0)2 45 92 21 88

S.C. Hawle S.R.L.  
Calea Sagalui 104  
RO-300516 Timisoara  
[www.hawle.ro](http://www.hawle.ro)

Telefon +40 268 47 78 81  
Telefax +40 356 80 06 68

Hawle Armaturen EOOD  
Prof. Ivan Georgov Str. 1a / Fl. 2  
BG-1220 Sofia  
[www.hawle.bg](http://www.hawle.bg)

Telefon +359 (0)2 931 12 77  
Telefax +359 (0)2 931 04 36

### Partners:

---

---

---

---

19.08.2014-1/plü

