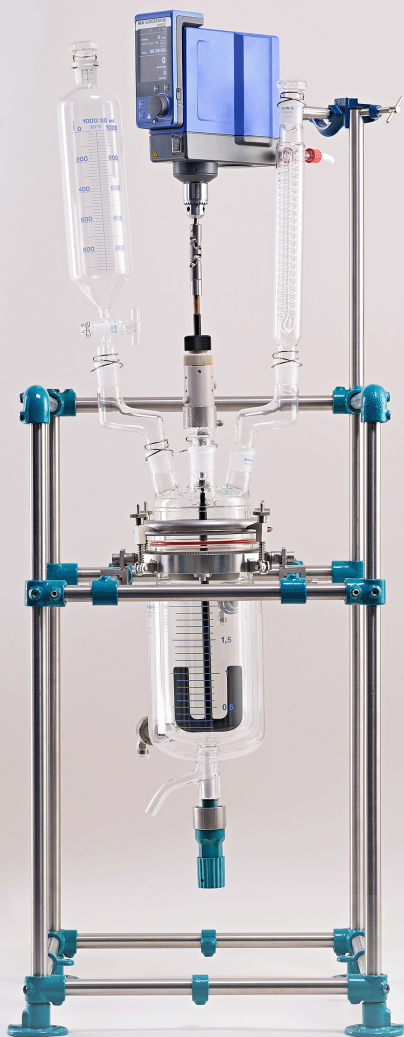


HWS Labortechnik

# General Catalogue



H ► W ► S  
L A B O R T E C H N I K

Development and Production of Laboratory Components and Systems in Glass, Metal and Plastic- Measuring and Control Technology Laboratory Electronics

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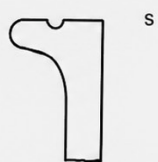


# The HWS Flat Flange Program



## You are free to choose

The present catalogue presents a survey of the more prevalent types of reactors. But we are always anxious to consider alterations and the special wishes of our customers quickly and at a reasonable price. Below you will find a list showing the main options. Please indicate the execution desired by adding the code letter to the reference number.



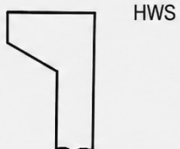
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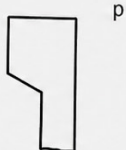
i



q



HWS



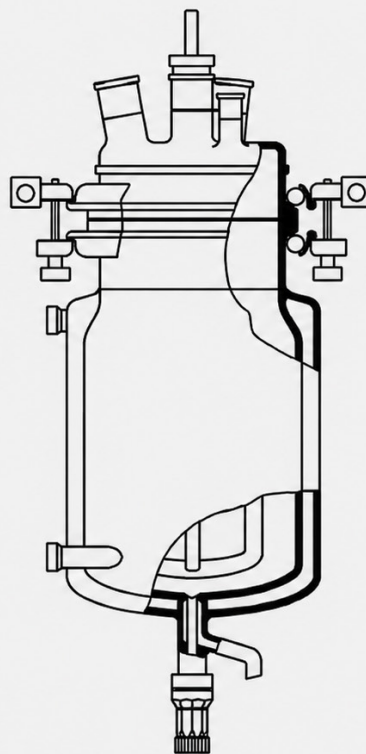
p



k



f



## 1. Flange Systems

### System

### Code Letter

HWS Standard

—

Schott Laboratory (without extra charge)

s

Schott Technical, plane

p

Schott Technical, spherical, ball

k

Schott Technical, spherical, socket

f

Schott Pilot (without extra charge)

i

QVF Tech

q

SVL

o

Execution to buyer's specifications

y

Fire polishing of flanges on request.

## 2. Nominal Width

Available: DN 35, DN 50, DN 60, DN 80, DN 100, DN 120, DN 150, DN 160, DN 200, DN 300.  
(For production reasons we cannot deliver all flanges and accessories for all dimensions.)

## 3. Joints for Jacketed Vessels

Available: DN 35, DN 50, DN 60, DN 80, DN 100, DN 120, DN 150, DN 160, DN 200, DN 300.

| Connection                          | Code Letter |
|-------------------------------------|-------------|
| Flat flange DN 15 (standard)        | —           |
| DN 10                               | R           |
| HWS-olive DN 10                     | K           |
| Thread GL 14 (without extra charge) | O           |
| Thread GL 18 (without extra charge) | T           |
| Execution to buyer's specifications | X           |

Fire polishing of flanges on request.

## 4. Bottom Outlet

- Spherical joints, conical joints, external threads (GL/SVL), internal threads, flat flanges, Rotulex (mainly without supplement)
- Spindle valves in PTFE (without dead volume):

| Connection              | Bore (mm)             | Code Letter |
|-------------------------|-----------------------|-------------|
| Type "T" Standard valve | 10                    | —           |
| Type "H"                | 20 (through diameter) | H           |
| Type "Q"                | 25 (through diameter) | Q           |
| Type "L" Linea 10       | 10                    | L           |
| Type "P" Linea 20       | 20                    | P           |
| Type "S" for NW 50      | —                     | S           |



- Pneumatic outlet valves, type “PT”, “PH” — problem-free mounting for vessels with hand- operated “T”-valve
- Stopcocks with straight bore / three way stopcocks, melted onto the vessel
- Ball valves in nichrome or other materials
- Magnetic outlet systems
- Outlet systems according to buyer's specifications

Normally our valves have a tube as outlet;  
available are connections like olive, GL-  
thread, joints, etc.



## 5. Vessels — Special Models

| Feature                                           | Code Letter |
|---------------------------------------------------|-------------|
| Lateral overflow outlet                           | U           |
| Additional bottom outlet                          | H           |
| Round bottom flask with flange                    | N           |
| Triplewall vessels — with socket for evacuation   | D           |
| Triplewall vessels — evacuated                    | A           |
| Triplewall vessels — evacuated and silver-plated  | V           |
| Heated flange                                     | W           |
| Graduation                                        | G           |
| Graduation on inner vessel (double walled)        | g           |
| Flat bottom (without extra charge) — outer bottom | F           |
| Flat bottom — inner bottom                        | I           |
| Flat bottom — inner and outer bottom              | B           |
| Flange with short neck for jacketed vessels       | Z           |
| Additional joints for heating jacket              | H           |

Also available:

- Plastic coated (Levasint, Polyurethane)
- Instainless steel, Halar, PTFE
- With brown colour for light-sensitive products

Even this list can only show a small part of the various possibilities. In case you did not find the desired execution/model, please send your inquiry and enclose drafts or samples or detailed description, respectively. We will manufacture small series and even single pieces according to your requirement!



## Special Information

The HWS flat flange reactor is manufactured with extreme care and precision in order to comply with all technical requirements and norm regulations. During the production all goods are controlled permanently and each finished good is inspected separately. This assures the user that the products have very long life, even under extreme operating conditions. Additionally to necessary indications we burn in the glass date of manufacture and an uninterrupted number, in order to provide our data bank with essential information. This code will help you by service, repair cases, or replacement orders.

Unless otherwise specified in the prospectus, the HWS flat flange reactor should be implemented without pressure or only under pressure up to 0.1 bar. The use of this product as a pressurized reactor in keeping with the relevant norms is not permissible.

However, should your particular application require pressure, please include maximum pressure and temperature requirements in your inquiry. Your special order will then be manufactured based on standard norms and will include a material test certificate.

The HWS flat flange reactor may also be easily implemented in a vacuum because of its torispherical shape and the special shape of the HWS flat flange lids. When making your order, please note that reactors with a flat bottom or a melted disc having smaller radii can only be used in a vacuum or under slight excess pressure in limited circumstances.



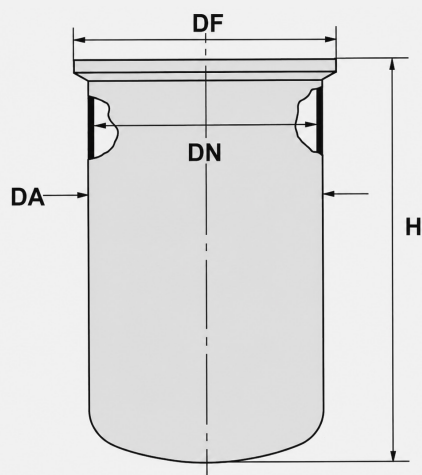


# HWS Flat Flange Vessels

## Type A: Cylindrical

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 100              | 50         | 80             | 60                  | 72         | 56         | 3 010 501 |
| 150              | 50         | 110            | 90                  | 72         | 56         | 3 010 502 |
| 250              | 50         | 170            | 140                 | 72         | 56         | 3 010 503 |
| 500              | 50         | 300            | 270                 | 72         | 56         | 3 010 505 |
| 100              | 60         | 80             | 55                  | 90         | 70         | 3 010 601 |
| 150              | 60         | 90             | 65                  | 90         | 70         | 3 010 602 |
| 250              | 60         | 1215           | 100                 | 90         | 70         | 3 010 603 |
| 500              | 60         | 210            | 185                 | 90         | 70         | 3 010 605 |
| 250              | 100        | 80             | 50                  | 130        | 110        | 3 011 003 |
| 500              | 100        | 110            | 75                  | 130        | 110        | 3 011 005 |
| 1 000            | 100        | 180            | 140                 | 130        | 110        | 3 011 010 |
| 2 000            | 100        | 330            | 290                 | 130        | 110        | 3 011 020 |
| 1 000            | 120        | 160            | 110                 | 150        | 130        | 3 011 210 |
| 2 000            | 120        | 250            | 100                 | 150        | 130        | 3 011 220 |
| 3 000            | 120        | 340            | 200                 | 150        | 130        | 3 011 230 |
| 1 000            | 150        | 120            | 290                 | 180        | 160        | 3 011 510 |
| 2 000            | 150        | 180            | 70                  | 180        | 160        | 3 011 520 |
| 3 000            | 150        | 240            | 190                 | 180        | 160        | 3 011 530 |
| 4 000            | 150        | 300            | 250                 | 180        | 160        | 3 011 540 |
| 5 000            | 150        | 350            | 300                 | 180        | 160        | 3 011 550 |

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 6 000            | 150        | 400            | 350                 | 180        | 160        | 3 011 560 |
| 10 000           | 150        | 625            | 575                 | 180        | 160        | 3 011 591 |
| 4 000            | 200        | 200            | 145                 | 235        | 215        | 3 012 040 |
| 5 000            | 200        | 230            | 180                 | 235        | 215        | 3 012 050 |
| 6 000            | 200        | 260            | 210                 | 235        | 215        | 3 012 060 |
| 10 000           | 200        | 390            | 340                 | 235        | 215        | 3 012 091 |
| 15 000           | 200        | 550            | 495                 | 235        | 215        | 3 012 092 |
| 20 000           | 200        | 700            | 650                 | 235        | 215        | 3 012 093 |
| 30 000           | 200        | 1000           | 950                 | 235        | 215        | 3 012 095 |
| 20 000           | 300        | 390            | 310                 | 338        | 315        | 3 013 200 |
| 30 000           | 300        | 530            | 450                 | 338        | 315        | 3 013 300 |
| 40 000           | 300        | 670            | 590                 | 338        | 315        | 3 013 400 |
| 50 000           | 300        | 810            | 730                 | 338        | 315        | 3 013 500 |



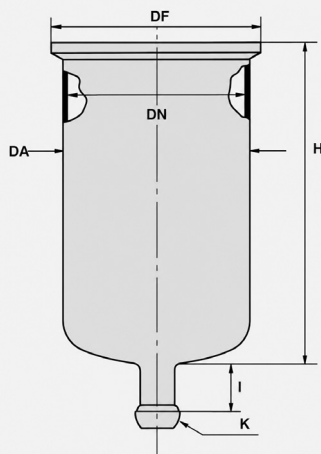
# HWS Flat Flange Vessels

## Type AA: Cylindrical with Bottom Outlet

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 100              | 50         | 80             | 60                  | 72         | 56         | 3 030 501 |
| 150              | 50         | 110            | 90                  | 72         | 56         | 3 030 502 |
| 250              | 50         | 170            | 140                 | 72         | 56         | 3 030 503 |
| 500              | 50         | 300            | 270                 | 72         | 56         | 3 030 505 |
| 100              | 60         | 80             | 55                  | 90         | 70         | 3 030 601 |
| 150              | 60         | 90             | 65                  | 90         | 70         | 3 030 602 |
| 250              | 60         | 125            | 100                 | 90         | 70         | 3 030 603 |
| 500              | 60         | 210            | 185                 | 90         | 70         | 3 030 605 |
| 250              | 100        | 80             | 50                  | 130        | 110        | 3 031 003 |
| 500              | 100        | 110            | 75                  | 130        | 110        | 3 031 005 |
| 1 000            | 100        | 180            | 140                 | 130        | 110        | 3 031 010 |
| 2 000            | 100        | 330            | 290                 | 130        | 110        | 3 031 020 |
| 1 000            | 120        | 160            | 110                 | 150        | 130        | 3 031 210 |
| 2 000            | 120        | 250            | 200                 | 150        | 130        | 3 031 220 |
| 3 000            | 120        | 340            | 290                 | 150        | 130        | 3 031 230 |
| 1 000            | 150        | 120            | 70                  | 180        | 160        | 3 031 510 |
| 2 000            | 150        | 180            | 130                 | 180        | 160        | 3 031 520 |
| 3 000            | 150        | 240            | 190                 | 180        | 160        | 3 031 530 |
| 4 000            | 150        | 300            | 250                 | 180        | 160        | 3 031 540 |
| 5 000            | 150        | 350            | 300                 | 180        | 160        | 3 031 550 |
| 6 000            | 150        | 400            | 350                 | 180        | 160        | 3 031 560 |



| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 10 000           | 150        | 625            | 575                 | 180        | 160        | 3 031 591 |
| 4 000            | 200        | 200            | 145                 | 235        | 215        | 3 032 040 |
| 5 000            | 200        | 230            | 180                 | 235        | 215        | 3 032 050 |
| 6 000            | 200        | 260            | 210                 | 235        | 215        | 3 032 060 |
| 10 000           | 200        | 390            | 340                 | 235        | 215        | 3 032 091 |
| 15 000           | 200        | 550            | 495                 | 235        | 215        | 3 032 092 |
| 20 000           | 200        | 700            | 650                 | 235        | 215        | 3 032 093 |
| 30 000           | 200        | 1000           | 950                 | 235        | 215        | 3 032 095 |
| 20 000           | 300        | 360            | 330                 | 338        | 315        | 3 033 200 |
| 30 000           | 300        | 590            | 470                 | 338        | 315        | 3 033 300 |
| 40 000           | 300        | 700            | 630                 | 338        | 315        | 3 033 400 |
| 50 000           | 300        | 840            | 770                 | 338        | 315        | 3 033 500 |

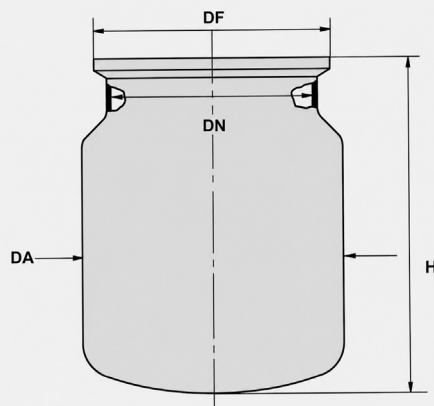


# HWS Flat Flange Vessels

## Type B: Short Form

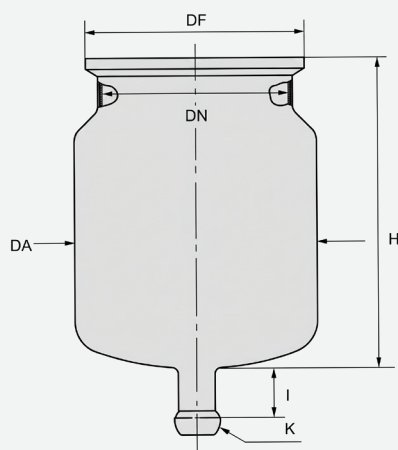
| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 4 000            | 150        | 250            | 170                 | 180        | 200        | 3 021 540 |
| 5 000            | 150        | 290            | 210                 | 180        | 200        | 3 021 550 |
| 6 000            | 150        | 340            | 260                 | 180        | 200        | 3 021 560 |
| 10 000           | 150        | 350            | 290                 | 180        | 240        | 3 021 591 |
| 15 000           | 150        | 450            | 380                 | 180        | 255        | 3 021 592 |
| 20 000           | 150        | 480            | 400                 | 180        | 290        | 3 021 593 |
| 10 000           | 200        | 350            | 290                 | 235        | 240        | 3 022 091 |
| 15 000           | 200        | 450            | 380                 | 235        | 255        | 3 022 092 |
| 20 000           | 200        | 480            | 400                 | 235        | 290        | 3 022 093 |
| 30 000           | 200        | 600            | 500                 | 235        | 300        | 3 022 095 |

Other executions, also with different nominal widths, available.  
Pmax = maximum allowable operating pressure at max. 200°C



## Type BA: Short Form

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 4 000            | 150        | 250            | 170                 | 180        | 200        | 3 041 540 |
| 5 000            | 150        | 290            | 210                 | 180        | 200        | 3 041 550 |
| 6 000            | 150        | 340            | 260                 | 180        | 200        | 3 041 560 |
| 10 000           | 150        | 350            | 290                 | 180        | 240        | 3 041 591 |
| 15 000           | 150        | 450            | 380                 | 180        | 255        | 3 041 592 |
| 20 000           | 150        | 480            | 400                 | 180        | 290        | 3 041 593 |
| 10 000           | 200        | 350            | 290                 | 235        | 240        | 3 042 091 |
| 15 000           | 200        | 450            | 380                 | 235        | 255        | 3 042 092 |
| 20 000           | 200        | 480            | 400                 | 235        | 290        | 3 042 093 |
| 30 000           | 200        | 600            | 500                 | 235        | 300        | 3 042 095 |



# HWS Flat Flange Vessels

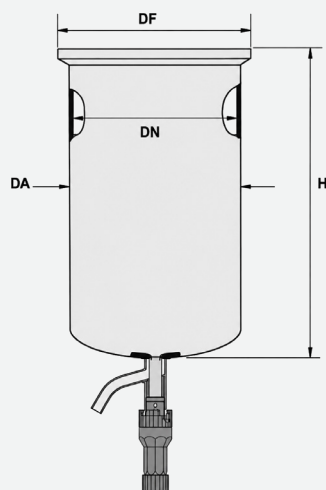
## Type AV: Cylindrical with Bottom Outlet Valve (PTFE)

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 100              | 50         | 80             | 60                  | 72         | 56         | 3 050 501 |
| 150              | 50         | 110            | 90                  | 72         | 56         | 3 050 502 |
| 250              | 50         | 170            | 140                 | 72         | 56         | 3 050 503 |
| 500              | 50         | 300            | 270                 | 72         | 56         | 3 050 505 |
| 100              | 60         | 80             | 55                  | 90         | 70         | 3 050 601 |
| 150              | 60         | 90             | 65                  | 90         | 70         | 3 050 602 |
| 250              | 60         | 125            | 100                 | 90         | 70         | 3 050 603 |
| 500              | 60         | 210            | 185                 | 90         | 70         | 3 050 605 |
| 250              | 100        | 80             | 50                  | 130        | 110        | 3 051 003 |
| 500              | 100        | 110            | 75                  | 130        | 110        | 3 051 005 |
| 1 000            | 100        | 180            | 140                 | 130        | 110        | 3 051 010 |
| 2 000            | 100        | 330            | 290                 | 130        | 110        | 3 051 020 |
| 1 000            | 120        | 160            | 110                 | 150        | 130        | 3 051 210 |
| 2 000            | 120        | 250            | 200                 | 150        | 130        | 3 051 220 |
| 3 000            | 120        | 340            | 290                 | 150        | 130        | 3 051 230 |
| 1 000            | 150        | 120            | 70                  | 180        | 160        | 3 051 510 |
| 2 000            | 150        | 180            | 130                 | 180        | 160        | 3 051 520 |
| 3 000            | 150        | 240            | 190                 | 180        | 160        | 3 051 530 |
| 4 000            | 150        | 300            | 250                 | 180        | 160        | 3 051 540 |
| 5 000            | 150        | 350            | 300                 | 180        | 160        | 3 051 550 |
| 6 000            | 150        | 400            | 350                 | 180        | 160        | 3 051 560 |



| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 10 000           | 150        | 625            | 575                 | 180        | 160        | 3 051 591 |
| 4 000            | 200        | 200            | 145                 | 235        | 215        | 3 052 040 |
| 5 000            | 200        | 230            | 180                 | 235        | 215        | 3 052 050 |
| 6 000            | 200        | 260            | 210                 | 235        | 215        | 3 052 060 |
| 10 000           | 200        | 390            | 340                 | 235        | 215        | 3 052 091 |
| 15 000           | 200        | 550            | 495                 | 235        | 215        | 3 052 092 |
| 20 000           | 200        | 700            | 650                 | 235        | 215        | 3 052 093 |
| 30 000           | 200        | 1000           | 950                 | 235        | 215        | 3 052 095 |
| 20 000           | 300        | 360            | 330                 | 338        | 315        | 3 053 200 |
| 30 000           | 300        | 590            | 470                 | 338        | 315        | 3 053 300 |
| 40 000           | 300        | 700            | 630                 | 338        | 315        | 3 053 400 |
| 50 000           | 300        | 840            | 770                 | 338        | 315        | 3 053 500 |

Standard version model "T" (for DN 60-DN 200); "H" (for DN 300).  
Other models, e.g. "H", "L", or "PT" available.



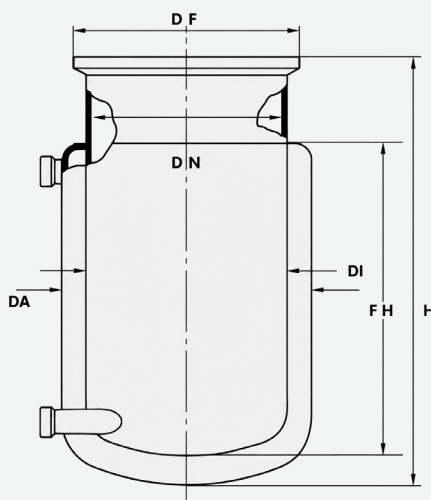
# HWS Flat Flange Vessels

## Type AD: Cylindrical, Jacketed

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 100              | 50         | 115            | 60                  | 72         | 75         | 3 110 501 |
| 150              | 50         | 145            | 90                  | 72         | 75         | 3 110 502 |
| 250              | 50         | 195            | 140                 | 72         | 75         | 3 110 503 |
| 500              | 50         | 325            | 270                 | 72         | 75         | 3 110 505 |
| 100              | 60         | 125            | 55                  | 90         | 70         | 3 110 601 |
| 150              | 60         | 135            | 65                  | 90         | 70         | 3 110 602 |
| 250              | 60         | 170            | 100                 | 90         | 70         | 3 110 603 |
| 500              | 60         | 255            | 185                 | 90         | 70         | 3 110 605 |
| 250              | 100        | 140            | 50                  | 130        | 110        | 3 111 003 |
| 500              | 100        | 165            | 75                  | 130        | 110        | 3 111 005 |
| 1 000            | 100        | 230            | 140                 | 130        | 110        | 3 111 010 |
| 2 000            | 100        | 380            | 290                 | 130        | 110        | 3 111 020 |
| 1 000            | 120        | 210            | 110                 | 150        | 130        | 3 111 210 |
| 2 000            | 120        | 300            | 200                 | 150        | 130        | 3 111 220 |
| 3 000            | 120        | 390            | 290                 | 150        | 130        | 3 111 230 |
| 1 000            | 150        | 170            | 70                  | 180        | 160        | 3 111 510 |
| 2 000            | 150        | 230            | 130                 | 180        | 160        | 3 111 520 |
| 4 000            | 150        | 295            | 190                 | 180        | 160        | 3 111 530 |
| 6 000            | 150        | 355            | 250                 | 180        | 160        | 3 111 540 |
| 5 000            | 150        | 400            | 300                 | 180        | 160        | 3 111 550 |

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 6 000            | 150        | 450            | 350                 | 180        | 200        | 3 111 560 |
| 10 000           | 150        | 675            | 575                 | 180        | 200        | 3 111 591 |
| 4 000            | 200        | 255            | 145                 | 235        | 250        | 3 112 040 |
| 5 000            | 200        | 290            | 185                 | 235        | 250        | 3 112 050 |
| 6 000            | 200        | 320            | 210                 | 235        | 250        | 3 112 060 |
| 10 000           | 200        | 445            | 340                 | 235        | 250        | 3 112 091 |
| 15 000           | 200        | 605            | 495                 | 235        | 250        | 3 112 092 |
| 20 000           | 200        | 760            | 650                 | 235        | 250        | 3 112 093 |
| 30 000           | 200        | 975            | 950                 | 235        | 250        | 3 112 095 |
| 20 000           | 300        | 460            | 340                 | 338        | 365        | 3 113 200 |
| 30 000           | 300        | 600            | 480                 | 338        | 365        | 3 113 300 |
| 40 000           | 300        | 760            | 620                 | 338        | 365        | 3 113 400 |
| 50 000           | 300        | 900            | 760                 | 338        | 365        | 3 113 500 |

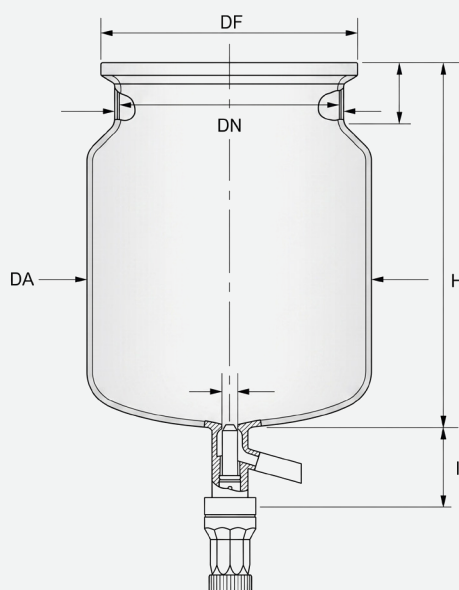
Connection for heating jacket: Flange NW15 (standard), HWS-hose olive, screw thread GL14/GL18 or Rotulex.



# HWS Flat Flange Vessels

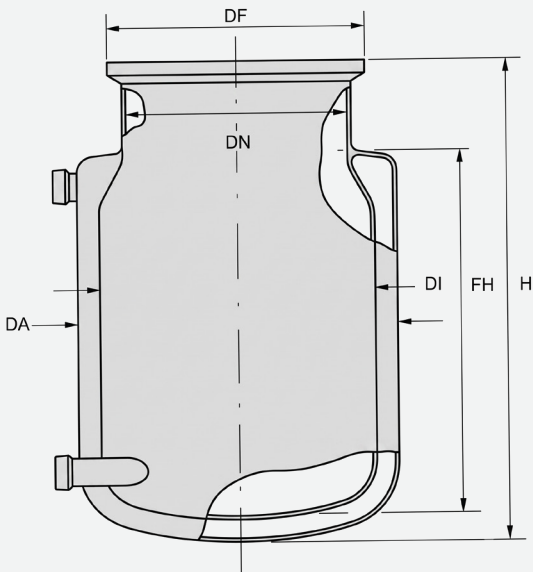
## Type BV: Short Form

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 4 000            | 150        | 250            | 170                 | 180        | 200        | 3 061 540 |
| 5 000            | 150        | 290            | 210                 | 180        | 200        | 3 061 550 |
| 6 000            | 150        | 340            | 260                 | 180        | 200        | 3 061 560 |
| 10 000           | 150        | 350            | 290                 | 180        | 240        | 3 061 591 |
| 15 000           | 150        | 450            | 380                 | 180        | 255        | 3 061 592 |
| 20 000           | 150        | 480            | 400                 | 180        | 290        | 3 061 593 |
| 10 000           | 200        | 350            | 290                 | 235        | 240        | 3 062 091 |
| 15 000           | 200        | 450            | 380                 | 235        | 255        | 3 062 092 |
| 20 000           | 200        | 480            | 400                 | 235        | 290        | 3 062 093 |
| 30 000           | 200        | 600            | 500                 | 235        | 300        | 3 062 095 |



Type BD: Short Form

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 4 000            | 150        | 285            | 195                 | 180        | 250        | 3 121 540 |
| 5 000            | 150        | 315            | 230                 | 180        | 250        | 3 121 550 |
| 6 000            | 150        | 365            | 265                 | 180        | 250        | 3 121 560 |
| 10 000           | 150        | 345            | 250                 | 180        | 300        | 3 121 591 |
| 15 000           | 150        | 440            | 345                 | 180        | 300        | 3 121 592 |
| 20 000           | 150        | 535            | 440                 | 180        | 300        | 3 121 593 |
| 10 000           | 200        | 345            | 250                 | 235        | 300        | 3 122 091 |
| 15 000           | 200        | 440            | 345                 | 235        | 300        | 3 122 092 |
| 20 000           | 200        | 535            | 440                 | 235        | 300        | 3 122 093 |
| 30 000           | 200        | 735            | 630                 | 235        | 300        | 3 122 095 |



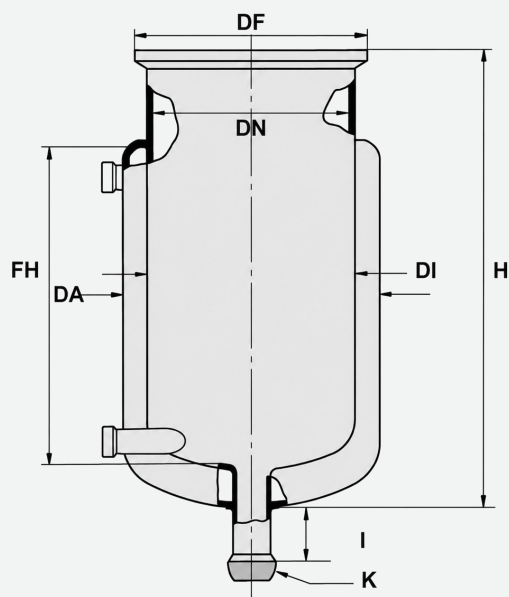


# HWS Flat Flange Vessels

Type ADA: Cylindrical, Jacketed, with Bottom Outlet

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 100              | 50         | 115            | 60                  | 72         | 75         | 3 130 501 |
| 150              | 50         | 145            | 90                  | 72         | 75         | 3 130 502 |
| 250              | 50         | 195            | 140                 | 72         | 75         | 3 130 503 |
| 500              | 50         | 325            | 270                 | 72         | 75         | 3 130 505 |
| 100              | 60         | 125            | 55                  | 90         | 100        | 3 130 601 |
| 150              | 60         | 135            | 65                  | 90         | 100        | 3 130 602 |
| 250              | 60         | 170            | 100                 | 90         | 100        | 3 130 603 |
| 500              | 60         | 265            | 185                 | 90         | 100        | 3 130 605 |
| 250              | 100        | 140            | 50                  | 130        | 140        | 3 131 003 |
| 500              | 100        | 165            | 75                  | 130        | 140        | 3 131 005 |
| 1 000            | 100        | 230            | 140                 | 130        | 140        | 3 131 010 |
| 2 000            | 100        | 380            | 290                 | 130        | 140        | 3 131 020 |
| 1 000            | 120        | 210            | 110                 | 150        | 150        | 3 131 210 |
| 2 000            | 120        | 300            | 200                 | 150        | 150        | 3 131 220 |
| 3 000            | 120        | 390            | 290                 | 150        | 150        | 3 131 230 |
| 1 000            | 150        | 170            | 70                  | 180        | 200        | 3 131 510 |
| 2 000            | 150        | 230            | 130                 | 180        | 200        | 3 131 520 |
| 3 000            | 150        | 295            | 190                 | 180        | 200        | 3 131 530 |
| 4 000            | 150        | 355            | 250                 | 180        | 200        | 3 131 540 |
| 5 000            | 150        | 400            | 300                 | 180        | 200        | 3 131 550 |
| 6 000            | 150        | 450            | 350                 | 180        | 200        | 3 131 560 |

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 10 000           | 150        | 675            | 575                 | 180        | 200        | 3 131 591 |
| 4 000            | 200        | 255            | 145                 | 235        | 250        | 3 132 040 |
| 5 000            | 200        | 290            | 180                 | 235        | 250        | 3 132 050 |
| 6 000            | 200        | 320            | 210                 | 235        | 250        | 3 132 060 |
| 10 000           | 200        | 445            | 340                 | 235        | 250        | 3 132 091 |
| 15 000           | 200        | 605            | 495                 | 235        | 250        | 3 132 092 |
| 20 000           | 200        | 760            | 650                 | 235        | 250        | 3 132 093 |
| 30 000           | 200        | 1080           | 975                 | 235        | 250        | 3 132 095 |
| 20 000           | 300        | 460            | 330                 | 338        | 365        | 3 133 200 |
| 30 000           | 300        | 600            | 470                 | 338        | 365        | 3 133 300 |
| 40 000           | 300        | 760            | 630                 | 338        | 365        | 3 133 400 |
| 50 000           | 300        | 900            | 770                 | 338        | 365        | 3 133 500 |

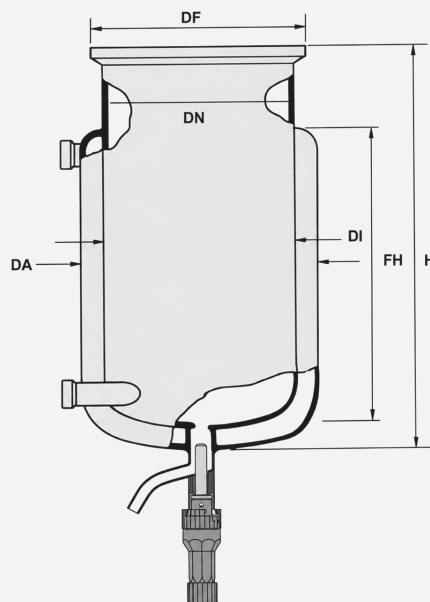


# HWS Flat Flange Vessels

Type ADAV: Cylindrical, Jacketed, with Bottom Outlet Valve (PTFE)

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 100              | 50         | 140            | 60                  | 72         | 75         | 3 150 501 |
| 150              | 50         | 170            | 90                  | 72         | 75         | 3 150 502 |
| 250              | 50         | 220            | 140                 | 72         | 75         | 3 150 503 |
| 500              | 50         | 350            | 270                 | 72         | 75         | 3 150 505 |
| 100              | 60         | 125            | 55                  | 90         | 100        | 3 150 601 |
| 150              | 60         | 135            | 65                  | 90         | 100        | 3 150 602 |
| 250              | 60         | 170            | 100                 | 90         | 100        | 3 150 603 |
| 500              | 60         | 255            | 185                 | 90         | 100        | 3 150 605 |
| 250              | 100        | 140            | 50                  | 130        | 140        | 3 151 003 |
| 500              | 100        | 165            | 75                  | 130        | 140        | 3 151 005 |
| 1 000            | 100        | 230            | 140                 | 130        | 140        | 3 151 010 |
| 2000             | 100        | 380            | 290                 | 130        | 140        | 3 151 020 |
| 1 000            | 120        | 210            | 110                 | 150        | 150        | 3 151 210 |
| 2 000            | 120        | 300            | 200                 | 150        | 150        | 3 151 220 |
| 3 000            | 120        | 390            | 290                 | 150        | 150        | 3 151 230 |
| 1 000            | 150        | 170            | 70                  | 180        | 200        | 3 151 510 |
| 2 000            | 150        | 230            | 130                 | 180        | 200        | 3 151 520 |
| 3 000            | 150        | 295            | 190                 | 180        | 200        | 3 151 530 |
| 4 000            | 150        | 355            | 250                 | 180        | 200        | 3 151 540 |
| 5 000            | 150        | 400            | 300                 | 180        | 200        | 3 151 550 |
| 6 000            | 150        | 450            | 350                 | 180        | 200        | 3 151 560 |

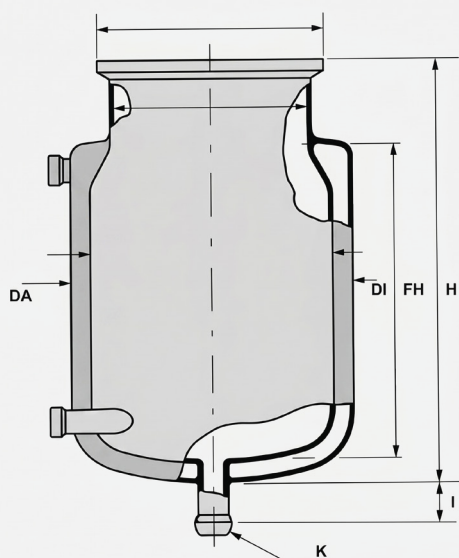
| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 10 000           | 150        | 675            | 575                 | 180        | 200        | 3 151 591 |
| 4 000            | 200        | 255            | 145                 | 235        | 250        | 3 152 040 |
| 5 000            | 200        | 290            | 185                 | 235        | 250        | 3 152 050 |
| 6 000            | 200        | 320            | 210                 | 235        | 250        | 3 152 060 |
| 10 000           | 200        | 445            | 340                 | 235        | 250        | 3 152 091 |
| 15 000           | 200        | 605            | 495                 | 235        | 250        | 3 152 092 |
| 20 000           | 200        | 760            | 660                 | 235        | 250        | 3 152 093 |
| 30 000           | 200        | 1080           | 975                 | 235        | 250        | 3 152 095 |
| 20 000           | 300        | 460            | 330                 | 338        | 365        | 3 153 200 |
| 30 000           | 300        | 600            | 470                 | 338        | 365        | 3 153 300 |
| 40 000           | 300        | 760            | 630                 | 338        | 365        | 3 153 400 |
| 50 000           | 300        | 900            | 770                 | 338        | 365        | 3 153 500 |



# HWS Flat Flange Vessels

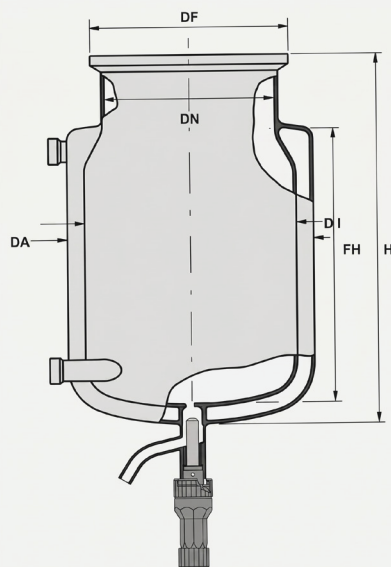
## Type BDA: Short Form

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 4 000            | 150        | 285            | 170                 | 180        | 250        | 3 141 540 |
| 5 000            | 150        | 315            | 210                 | 180        | 250        | 3 141 550 |
| 6 000            | 150        | 365            | 260                 | 180        | 250        | 3 141 560 |
| 10 000           | 150        | 345            | 250                 | 180        | 300        | 3 141 591 |
| 15 000           | 150        | 440            | 345                 | 180        | 300        | 3 141 592 |
| 20 000           | 150        | 535            | 440                 | 180        | 300        | 3 141 593 |
| 10 000           | 200        | 345            | 250                 | 235        | 300        | 3 142 091 |
| 15 000           | 200        | 440            | 345                 | 235        | 300        | 3 142 092 |
| 20 000           | 200        | 535            | 440                 | 235        | 300        | 3 142 093 |
| 30 000           | 200        | 735            | 630                 | 235        | 300        | 3 142 095 |



Type BDAV: Short Form

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 4 000            | 150        | 285            | 195                 | 180        | 250        | 3 161 540 |
| 5 000            | 150        | 315            | 230                 | 180        | 250        | 3 161 550 |
| 6 000            | 150        | 365            | 265                 | 180        | 250        | 3 161 560 |
| 10 000           | 150        | 345            | 250                 | 180        | 300        | 3 161 591 |
| 15 000           | 150        | 440            | 345                 | 180        | 300        | 3 161 592 |
| 20 000           | 150        | 535            | 440                 | 180        | 300        | 3 161 593 |
| 10 000           | 200        | 345            | 250                 | 235        | 300        | 3 162 091 |
| 15 000           | 200        | 440            | 345                 | 235        | 300        | 3 162 092 |
| 20 000           | 200        | 535            | 440                 | 235        | 300        | 3 162 093 |
| 30 000           | 200        | 735            | 630                 | 235        | 300        | 3 162 095 |

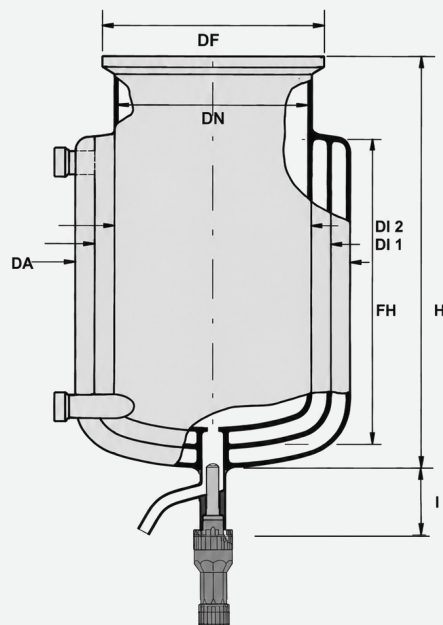
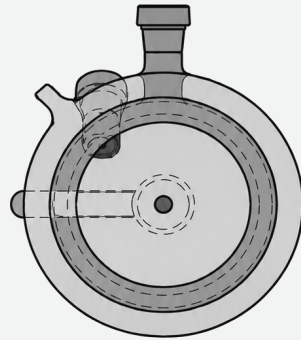


# HWS Flat Flange Vessels

Type ATAV: Cylindrical, Triple Walled with Bottom Outlet Valve

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 250              | 60         | 170            | 100                 | 90         | 130        | 3 154 603 |
| 500              | 60         | 275            | 185                 | 90         | 130        | 3 154 605 |
| 250              | 100        | 150            | 50                  | 130        | 160        | 3 154 003 |
| 500              | 100        | 175            | 75                  | 130        | 160        | 3 154 005 |
| 1 000            | 100        | 240            | 140                 | 130        | 160        | 3 154 010 |
| 1 000            | 120        | 220            | 110                 | 150        | 190        | 3 154 210 |
| 2 000            | 120        | 310            | 200                 | 150        | 190        | 3 154 220 |
| 2 000            | 150        | 245            | 130                 | 180        | 225        | 3 154 520 |
| 3 000            | 150        | 310            | 190                 | 180        | 225        | 3 154 530 |
| 5 000            | 150        | 415            | 300                 | 180        | 225        | 3 154 550 |
| 10 000           | 150        | 690            | 575                 | 180        | 225        | 3 154 591 |
| 5 000            | 200        | 310            | 180                 | 235        | 300        | 3 154 650 |
| 6 000            | 200        | 335            | 210                 | 235        | 300        | 3 154 660 |
| 10 000           | 200        | 465            | 340                 | 235        | 300        | 3 154 691 |
| 15 000           | 200        | 620            | 495                 | 235        | 300        | 3 154 692 |
| 20 000           | 200        | 775            | 650                 | 235        | 300        | 3 154 693 |

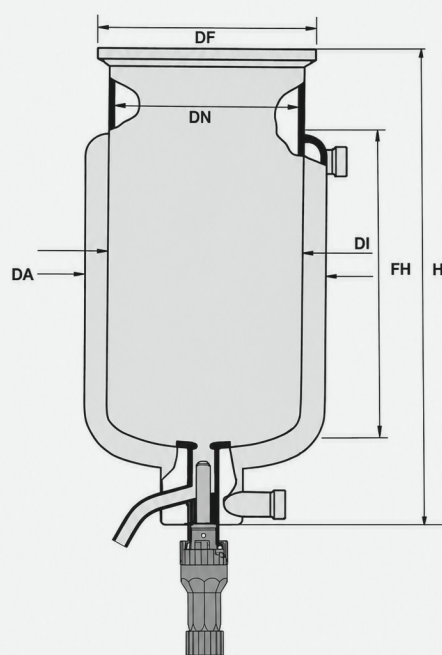
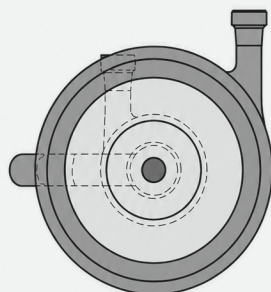




# HWS Flat Flange Vessels

Type ADAU: Cylindrical, Jacketed, with Heated Bottom Outlet Valve

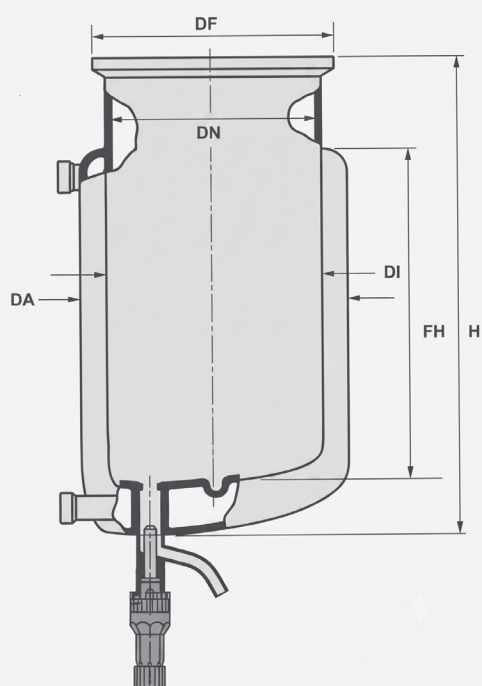
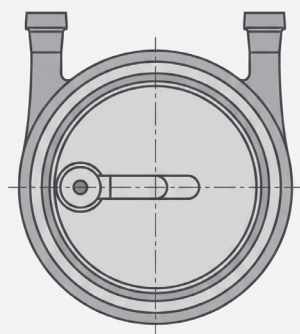
| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 250              | 60         | 225            | 100                 | 90         | 100        | 3 170 603 |
| 500              | 60         | 310            | 185                 | 90         | 100        | 3 170 605 |
| 250              | 100        | 185            | 50                  | 130        | 140        | 3 171 003 |
| 500              | 100        | 210            | 75                  | 130        | 140        | 3 171 005 |
| 1000             | 100        | 275            | 140                 | 130        | 140        | 3 171 010 |
| 1000             | 120        | 250            | 110                 | 150        | 150        | 3 171 210 |
| 2000             | 120        | 340            | 200                 | 150        | 150        | 3 171 220 |
| 2000             | 150        | 275            | 130                 | 180        | 200        | 3 171 520 |
| 3000             | 150        | 340            | 190                 | 180        | 200        | 3 171 530 |
| 5000             | 150        | 445            | 300                 | 180        | 200        | 3 171 550 |
| 10000            | 150        | 720            | 575                 | 180        | 200        | 3 171 591 |
| 5000             | 200        | 340            | 185                 | 235        | 250        | 3 172 050 |
| 6000             | 200        | 365            | 210                 | 235        | 250        | 3 172 060 |
| 10000            | 200        | 490            | 340                 | 235        | 250        | 3 172 091 |
| 15000            | 200        | 650            | 495                 | 235        | 250        | 3 172 092 |
| 20000            | 200        | 805            | 650                 | 235        | 250        | 3 172 093 |



# HWS Flat Flange Vessels

Type ADAZ: Cylindrical, Jacketed, with Off-Centre Bottom Outlet Valve and Stirrer Guide

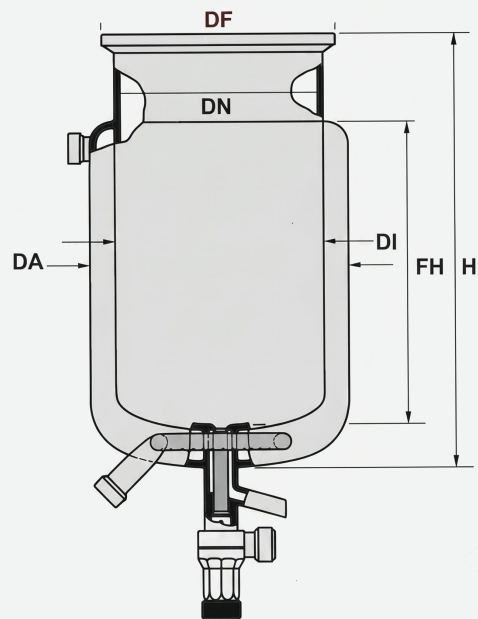
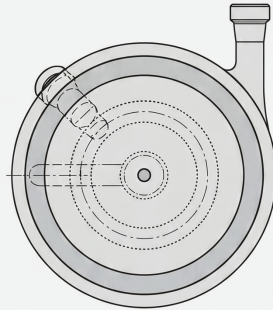
| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 250              | 100        | 185            | 50                  | 130        | 140        | 3 181 003 |
| 500              | 100        | 210            | 75                  | 130        | 140        | 3 181 005 |
| 1 000            | 100        | 275            | 140                 | 130        | 140        | 3 181 010 |
| 1 000            | 120        | 255            | 110                 | 150        | 150        | 3 181 210 |
| 2 000            | 120        | 345            | 200                 | 150        | 150        | 3 181 220 |
| 2 000            | 150        | 275            | 130                 | 180        | 200        | 3 181 520 |
| 3 000            | 150        | 335            | 190                 | 180        | 200        | 3 181 530 |
| 5 000            | 150        | 445            | 300                 | 180        | 200        | 3 181 550 |
| 10 000           | 150        | 720            | 575                 | 180        | 200        | 3 181 591 |
| 5 000            | 200        | 340            | 180                 | 235        | 250        | 3 182 050 |
| 6 000            | 200        | 365            | 210                 | 235        | 250        | 3 182 060 |
| 10 000           | 200        | 490            | 340                 | 235        | 250        | 3 182 091 |
| 15 000           | 200        | 650            | 495                 | 235        | 250        | 3 182 092 |
| 20 000           | 200        | 805            | 650                 | 235        | 250        | 3 182 093 |



# HWS Flat Flange Vessels

Type ADAR: Cylindrical, Jacketed, Circular Inlet of Heat Transfer Medium, with Bottom Outlet Valve

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 250              | 60         | 225            | 100                 | 90         | 100        | 3 190 603 |
| 500              | 60         | 310            | 185                 | 90         | 100        | 3 190 605 |
| 250              | 100        | 185            | 50                  | 130        | 140        | 3 191 003 |
| 500              | 100        | 210            | 75                  | 130        | 140        | 3 191 005 |
| 1 000            | 100        | 275            | 140                 | 130        | 140        | 3 191 010 |
| 1 000            | 120        | 255            | 110                 | 150        | 150        | 3 191 210 |
| 2 000            | 120        | 345            | 345                 | 150        | 150        | 3 191 220 |
| 2 000            | 150        | 275            | 130                 | 180        | 200        | 3 191 520 |
| 3 000            | 150        | 335            | 190                 | 180        | 200        | 3 191 530 |
| 5 000            | 150        | 445            | 300                 | 180        | 200        | 3 191 550 |
| 10 000           | 150        | 720            | 575                 | 180        | 200        | 3 191 591 |
| 5 000            | 200        | 340            | 180                 | 235        | 250        | 3 192 050 |
| 6 000            | 200        | 365            | 210                 | 235        | 250        | 3 192 060 |
| 10 000           | 200        | 490            | 340                 | 235        | 250        | 3 192 091 |
| 15 000           | 200        | 650            | 495                 | 235        | 250        | 3 192 092 |
| 20 000           | 200        | 805            | 650                 | 235        | 250        | 3 192 093 |

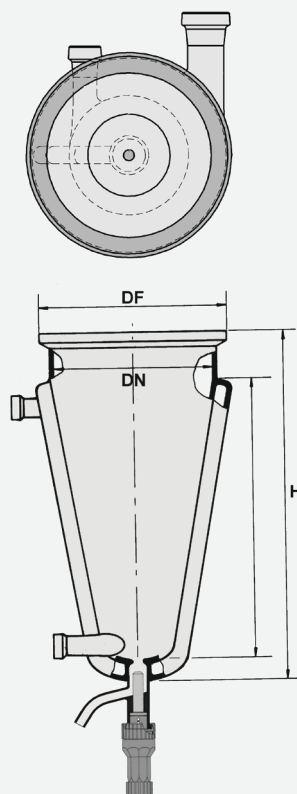


# HWS Flat Flange Vessels

Type KDAV: Conical, Jacketed, with Outlet Valve and Stirrer Guide

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 500              | 100        | 325            | 235                 | 130        | 140        | 3 158 105 |
| 750              | 100        | 425            | 335                 | 130        | 140        | 3 158 108 |
| 1 000            | 100        | 530            | 440                 | 130        | 140        | 3 158 110 |
| 1 000            | 120        | 380            | 290                 | 150        | 160        | 3 158 210 |
| 2 000            | 120        | 635            | 545                 | 150        | 160        | 3 158 220 |
| 2 000            | 150        | 425            | 325                 | 180        | 200        | 3 158 520 |
| 3 000            | 150        | 570            | 470                 | 180        | 200        | 3 158 530 |
| 5 000 **         | 150        | 850            | 750                 | 180        | 200        | 3 158 550 |

\*\* up to 3 ltr. conical, otherwise cylindrical

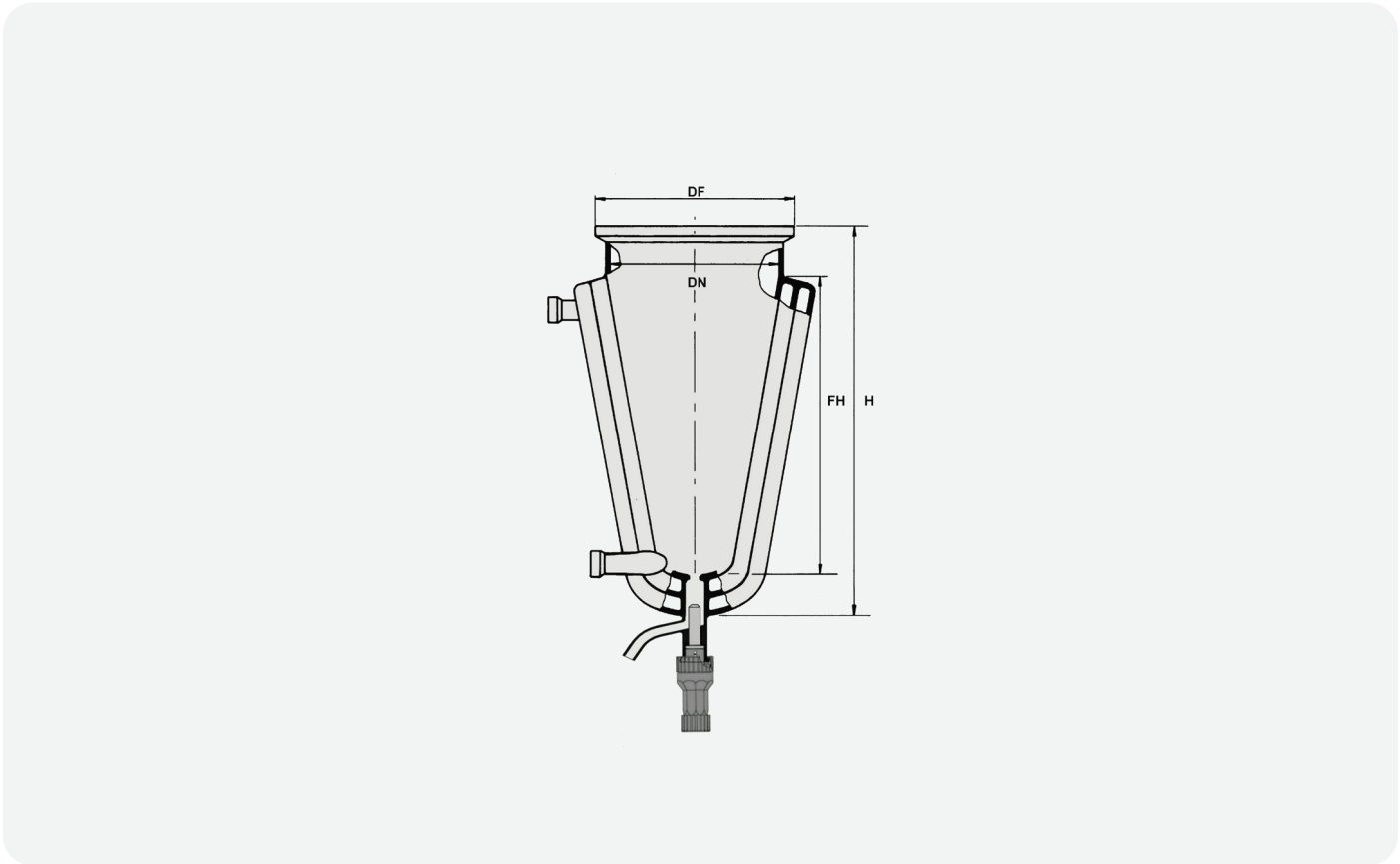




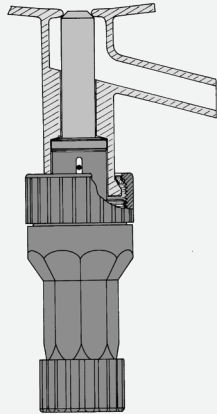
# Type KTAV: Conical, Triple Walled, with Outlet Valve Medium, with Bottom Outlet Valve

| Capacity<br>(ml) | DN<br>(mm) | Height<br>(mm) | Fill Height<br>(mm) | DF<br>(mm) | DA<br>(mm) | Cat. No.  |
|------------------|------------|----------------|---------------------|------------|------------|-----------|
| 500              | 100        | 325            | 235                 | 130        | 140        | 3 159 105 |
| 750              | 100        | 425            | 335                 | 130        | 140        | 3 159 108 |
| 1 000            | 100        | 530            | 440                 | 130        | 140        | 3 159 110 |
| 1 000            | 120        | 380            | 290                 | 150        | 160        | 3 159 210 |
| 2 000            | 120        | 635            | 545                 | 150        | 160        | 3 159 220 |
| 2 000            | 150        | 425            | 325                 | 180        | 200        | 3 159 520 |
| 3 000            | 150        | 570            | 470                 | 180        | 200        | 3 159 530 |
| 5 000 **         | 150        | 850            | 750                 | 180        | 200        | 3 159 550 |

\*\* up to 3 ltr. conical, otherwise cylindrical

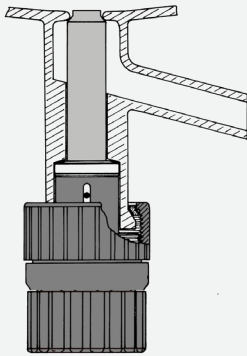


# HWS Bottom Outlet Valves



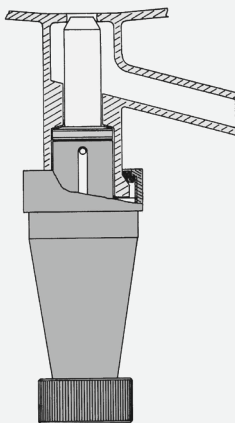
## Model "T" (Standard for NW 60-NW 200)

PTFE valve with minimum dead-volume, 10 mm diameter, with integrated angle outlet, for liquids with varied viscosity, with integrated spring for spindle for total sealing even under variable temperature conditions. Can be exchanged with pneumatic valves and valves with integrated PT 100.



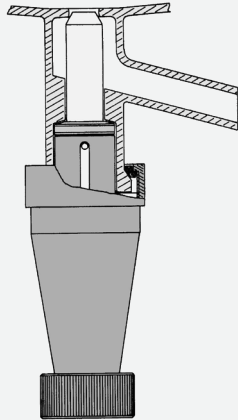
## Model "K"

Same as "T", however short form, max. stroke height 10 mm.



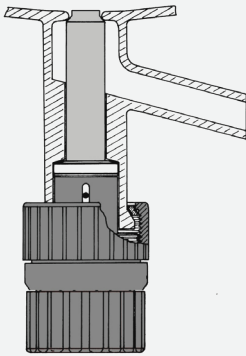
## Model "H" (Standard for NW 300)

Same as "T", however with 20 mm outlet.



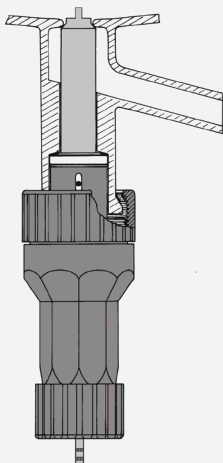
### Model "Q"

Same as "H", however with 25 mm outlet.



### Model "M"

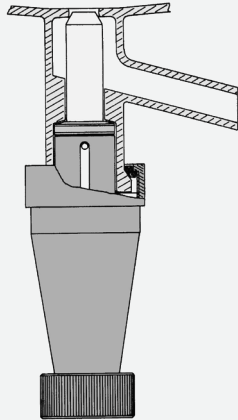
Same as "H", however short form, max. stroke 15 mm.



### Model "T/PT"

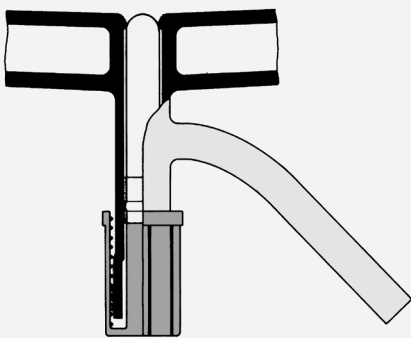
Same as "T", however with PT 100 sensor in spindle for the trouble-free measurement of temperature.

# HWS Bottom Outlet Valves



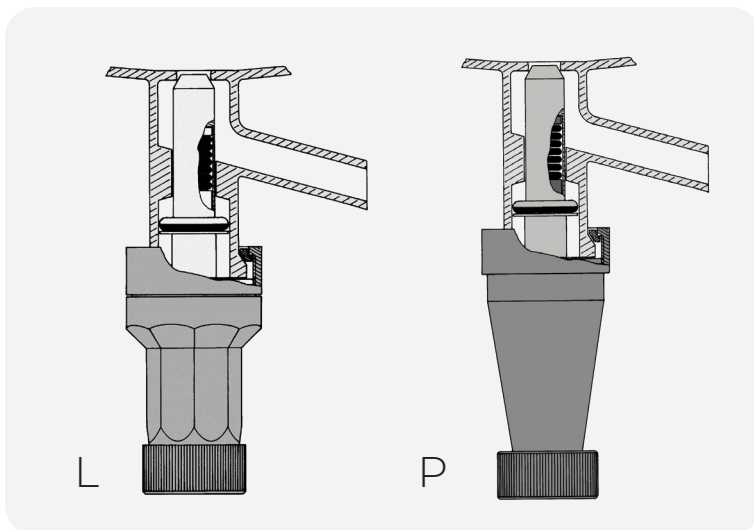
## Model "H/PT"

Same as "H", however with PT 100 sensor in spindle.



## Model "S" (Standard for NW 50)

PTFE valve with 2.5 mm outlet diameter. HWS outlet valves are manufactured with a standard outlet angle of 30° (outlet to the right), tube end is sealed. Other angles and connections (thread, Rotulex, spherical joint, conical joint, flat flange or olive) available on request.



## Outlet Valve “LINEA”

“LINEA” is a spindle valve without dead volume; it includes special provision for total outlet and an adjustable seal. The valve spindle works according to the principle of a piston (non-rotating).

“LINEA” is available with a bore of 10 mm (model L) and 20 mm (model P).

### Features for higher security:

- Self-adjusting spindle pressure-point — total sealing even under variable temperature conditions
- Additional security sealing — granting an optimum of security
- Display for optical documentation of use — reminding of timely exchange of valve spindle
- Shock-resistant flat flange (fire-polished) and low construction measurements — providing protection against mechanical damage

## Valve Summary Table

| Model | Bore (mm) | Cat. No   | Code Letter |
|-------|-----------|-----------|-------------|
| T     | 10        | 3 200 100 | (Standard)  |
| K     | 10        | 3 200 600 | K           |
| H     | 20        | 3 200 200 | H           |
| Q     | 25        | 3 202 200 | Q           |
| M     | 20        | 3 200 700 | M           |
| T/PT  | 10        | 3 200 190 | T/PT        |
| H/PT  | 20        | 3 200 290 | H/PT        |
| L     | 10        | 3 200 300 | L           |
| P     | 20        | 3 200 400 | P           |
| S     | 2.5       | 3 200 500 | S           |

# HWS Spare Parts

## HWS Spare Parts for Bottom Outlet Valves

Replacement valves, spindles, and seals (Viton/PTFE, Silicone/PTFE, Silicone/FEP, Perfluor-O-Ring) available for all valve models. See catalog page 12 for full part numbers.

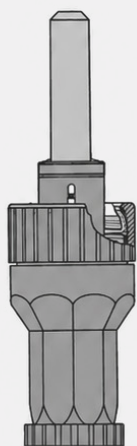
Stopcocks and outlet valves for Type AA, BA, ADA, BDA also available.

\*SFBO: Stopcock for bottom outlet for Type AA, BA, ADA, BDA,

\*\*OVFBO: Outlet valve for bottom outlet for Type AA, BA, ADA, BDA,

## Valve Summary Table

| Model | Bore (mm) | Cat. No   | Code Letter |
|-------|-----------|-----------|-------------|
| T     | 10        | 3 200 100 | (Standard)  |
| K     | 10        | 3 200 600 | K           |
| H     | 20        | 3 200 200 | H           |
| Q     | 25        | 3 202 200 | Q           |
| M     | 20        | 3 200 700 | M           |
| T/PT  | 10        | 3 200 190 | T/PT        |
| H/PT  | 20        | 3 200 290 | H/PT        |
| L     | 10        | 3 200 300 | L           |
| P     | 20        | 3 200 400 | P           |
| S     | 2.5       | 3 200 500 | S           |



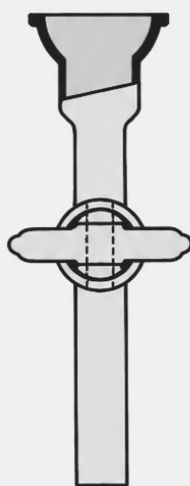
T



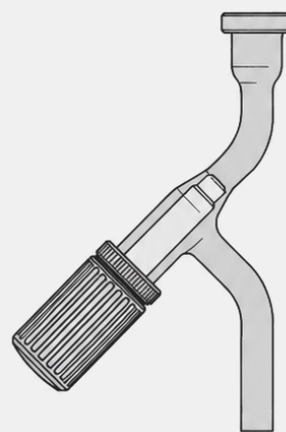
K, M, H, Q



L, P



\*SFBO



\*\*OVFBO

# HWS valve, pneumatic

## HWS Pneumatic Regulator PAV 90

For bottom outlet and dosing valves.

Suited for high temperatures and aggressive agents. Separation of regulator from pneumatic valve allows adjustment even in ex-rooms. Valve operation manually, by cable or by PC. Built-in dose regulator allows dosing in rates from 1 to 999 sec. Requires 2.5 bar air pressure.

| Item                            | Cat. No.  |
|---------------------------------|-----------|
| Controller (table version)      | 6 750 100 |
| Controller (with support rod)   | 6 750 101 |
| Pressure reduction, 0-6 bar     | 6 750 105 |
| PTFE hose, blue, 4 mm, 10 m     | 6 750 106 |
| PTFE hose, yellow, 5mm, 10 m    | 6 750 107 |
| PTFE hose, red, 4 mm, 10 m      | 6 750 108 |
| Hand key for remote control, 5m | 6 750 110 |



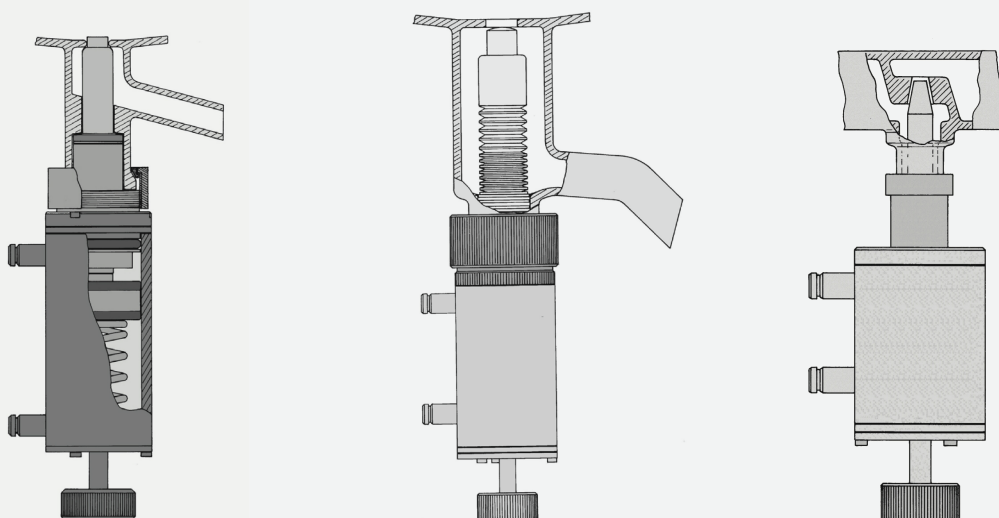


## HWS Pneumatic Valves

All HWS reactors and HWS dosing funnels can alternatively be equipped with either manually used or pneumatic valves. Model PT and PH are foreseen for an unproblematic exchange against standard valves.

| Model | Bore (mm)                         | Cat. No   | Code Letter * |
|-------|-----------------------------------|-----------|---------------|
| PT    | With PTFE spindle "T"             | 3 250 100 | 3 251 100     |
| PT/P  | With PTFE spindle "T" with PT 100 | 3 250 195 | 3 251 195     |
| PH    | With PTFE spindle "H"             | 3 250 200 | 3 251 200     |
| PH/P  | With PTFE spindle "H" with PT 100 | 3 250 295 | 3 251 295     |
| PTG   | With glass needle spindle         | 3 250 300 | 3 251 300     |
| PP/15 | With PTFE bellows, 15 mm          | 3 250 400 | 3 251 400     |
| PP/25 | With PTFE bellows, 25 mm          | 3 250 500 | 3 251 500     |
| PD    | Dosing valve with PTFE spindle    | 3 260 000 | 3 261 000     |
| PDG   | Dosing valve with glass spindle   | 3 260 100 | 3 261 100     |

\* Complete with glass part for retrofitting existing equipment.



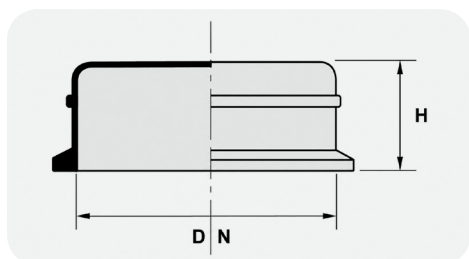
# HWS Lid flat flange



## HWS Flat Flange Lids

The flat flange lids with nominal widths DN 100, DN 120, DN 150 and DN 200 are provided with a bead to provide the utmost security for the fixing.

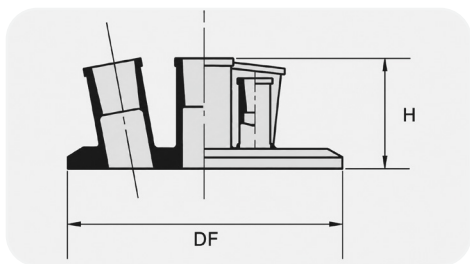
On special request instead of NS joints you can choose between screw-threads, flat flanges, or spherical joints. Side sockets are angled normally at 10°. Other inclinations are offered on request. Other models, even with more than 4 side sockets, are available according to your wishes.



## Lid flat flange without socket

Other executions, also with different nominal widths, available, Infos at page III

| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|----------------|-----------|
| 50             | —                     | — / —                                | 35             | 3 305 000 |
| 60             | —                     | — / —                                | 65             | 3 305 001 |
| 100            | —                     | — / —                                | 65             | 3 305 002 |
| 120            | —                     | — / —                                | 65             | 3 305 005 |
| 150            | —                     | — / —                                | 70             | 3 305 003 |
| 200            | —                     | — / —                                | 95             | 3 305 004 |

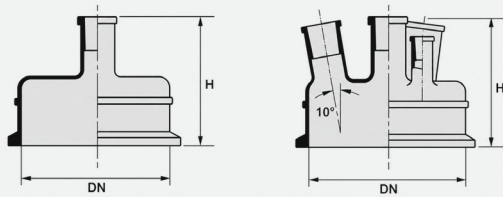


## Discs for flange vessels

Other executions, also with different nominal widths, available, Infos at page III

| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|----------------|-----------|
| 50             | —                     | — / —                                | 20             | 3 324 001 |
| 60             | —                     | — / —                                | 20             | 3 324 002 |
| 100            | —                     | — / —                                | 20             | 3 324 003 |
| 100            | 19                    | — / —                                | 70             | 3 324 101 |
| 100            | 29                    | — / —                                | 70             | 3 324 111 |
| 120            | 29                    | 2 x 19 / 1 x 19                      | 70             | 3 324 210 |
| 120            | 29                    | 2 x 29 / 1 x 29                      | 70             | 3 324 220 |
| 150            | —                     | — / —                                | 20             | 3 324 005 |
| 150            | 29                    | — / —                                | 70             | 3 324 510 |
| 150            | 29                    | 2 x 29 / 1 x 14                      | 70             | 3 324 520 |
| 150            | 29                    | 2 x 29 / 1 x 19                      | 70             | 3 324 530 |
| 200            | —                     | — / —                                | 20             | 3 324 006 |
| 200            | 29                    | 2 x 29 / 1 x 19                      | 70             | 3 324 920 |
| 200            | 45                    | 2 x 29 / 1 x 19                      | 85             | 3 324 930 |

# HWS Lid flat flange



## Lid flat flange

Other executions, also with different nominal widths

| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|----------------|-----------|
| 50             | 14/23                 | — / —                                | 75             | 3 305 011 |
| 50             | 19/26                 | — / —                                | 80             | 3 305 012 |
| 50             | 29/32                 | — / —                                | 95             | 3 305 013 |
| 50             | 14/23                 | 2 x 10/19 / 2 x 10/19                | 75             | 3 305 014 |
| 50             | 29/32                 | 2 x 19/26 / —                        | 95             | 3 305 015 |
| 50             | 14/23                 | — / 2 x 10/19                        | 75             | 3 305 021 |
| 50             | 14/23                 | 2 x 10/19 / —                        | 75             | 3 305 031 |
| 60             | 14/23                 | — / —                                | 90             | 3 306 011 |
| 60             | 19/26                 | — / —                                | 95             | 3 306 012 |
| 60             | 29/32                 | — / —                                | 100            | 3 306 013 |
| 60             | 19/26                 | 2 x 14/23 / 1 x 14/23                | 95             | 3 306 014 |
| 60             | 29/32                 | 2 x 14/23 / —                        | 100            | 3 306 015 |
| 60             | 19/26                 | — / 1 x 14/23                        | 95             | 3 306 016 |
| 60             | 19/26                 | 2 x 19/26 / —                        | 95             | 3 306 017 |
| 60             | 19/26                 | 2 x 29/32 / —                        | 95             | 3 306 018 |
| 60             | 19/26                 | — / —                                | 95             | 3 306 019 |
| 60             | 29/32                 | 1 x 29/32 / —                        | 100            | 3 306 020 |
| 60             | 29/32                 | 2 x 19/26 / —                        | 100            | 3 306 021 |

| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|----------------|-----------|
| 60             | 29/32                 | 2 x 29/32 / —                        | 100            | 3 306 024 |
| 100            | 29/32                 | — / —                                | 125            | 3 310 011 |
| 100            | 29/32                 | — / 1 x 14/23                        | 125            | 3 310 012 |
| 100            | 29/32                 | — / 1 x 29/32                        | 125            | 3 310 021 |
| 100            | 29/32                 | 1 x 29/32 / —                        | 125            | 3 310 022 |
| 100            | 29/32                 | 1 x 14/23 / —                        | 125            | 3 310 029 |
| 100            | 29/32                 | 1 x 29/32 / 1 x 14/23                | 125            | 3 310 032 |
| 100            | 29/32                 | 2 x 29/32 / —                        | 125            | 3 310 033 |
| 100            | 29/32                 | 2 x 14/23 / 1 x 29/32                | 125            | 3 310 042 |
| 100            | 29/32                 | 2 x 29/32 / 1 x 14/23                | 125            | 3 310 043 |
| 100            | 29/32                 | 2 x 29/32 / 1 x 29/32                | 125            | 3 310 044 |
| 100            | 29/32                 | 2 x 29/32 / 1 x 19/26                | 125            | 3 310 045 |
| 100            | 29/32                 | 4 x 29/32 / —                        | 125            | 3 310 050 |
| 100            | 45/40                 | — / —                                | 150            | 3 310 070 |
| 120            | 29/32                 | — / —                                | 125            | 3 312 011 |
| 120            | 29/32                 | — / 1 x 14/23                        | 125            | 3 312 012 |
| 120            | 29/32                 | — / 1 x 29/32                        | 125            | 3 312 013 |
| 120            | 29/32                 | 2 x 14/23 / —                        | 125            | 3 312 031 |
| 120            | 29/32                 | 2 x 29/32 / 1 x 14/23                | 125            | 3 312 043 |
| 120            | 29/32                 | 2 x 29/32 / 1 x 29/32                | 125            | 3 312 052 |
| 120            | 45/40                 | — / —                                | 150            | 3 312 071 |
| 120            | 45/40                 | — / 1 x 14/23                        | 150            | 3 312 072 |

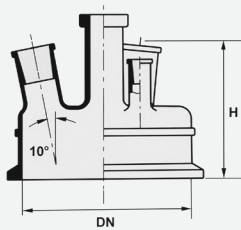
# HWS Lid flat flange

## Lid flat flange

| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|----------------|-----------|
| 120            | 45/40                 | — / 1 x 29/32                        | 150            | 3 312 073 |
| 120            | 45/40                 | 2 x 29/32 / —                        | 150            | 3 312 081 |
| 150            | 45/40                 | 2 x 29/32 / 1 x 14/23                | 150            | 3 312 082 |
| 150            | 29/32                 | — / —                                | 125            | 3 315 011 |
| 150            | 29/32                 | — / 1 x 14/23                        | 125            | 3 315 021 |
| 150            | 29/32                 | — / 1 x 29/32                        | 125            | 3 315 022 |
| 150            | 29/32                 | — / —                                | 125            | 3 315 030 |
| 150            | 29/32                 | 2 x 14/23 / —                        | 125            | 3 315 031 |
| 150            | 29/32                 | 2 x 29/32 / —                        | 125            | 3 315 032 |
| 150            | 29/32                 | 2 x 29/32 / 1 x 14/23                | 125            | 3 315 042 |
| 150            | 29/32                 | 2 x 14/23 / 1 x 29/32                | 125            | 3 315 043 |
| 150            | 29/32                 | 2 x 29/32 / 2 x 29/32                | 125            | 3 315 044 |
| 150            | 29/32                 | 2 x 29/32 / 1 x 29/32                | 125            | 3 315 047 |
| 150            | 29/32                 | 4 x 29/32 / —                        | 125            | 3 315 053 |
| 150            | 29/32                 | 2 x 29/32 / 2 x 29/32                | 125            | 3 315 051 |
| 150            | 29/32                 | — / 4 x 29/32                        | 150            | 3 315 050 |
| 150            | 45/40                 | — / —                                | 150            | 3 315 061 |
| 150            | 45/40                 | — / 1 x 14/23                        | 150            | 3 315 062 |
| 150            | 45/40                 | — / 1 x 29/32                        | 150            | 3 315 063 |
| 150            | 45/40                 | 2 x 14/23 / —                        | 150            | 3 315 064 |
| 150            | 45/40                 | 2 x 29/32 / —                        | 150            | 3 315 065 |
| 150            | 45/40                 | 2 x 14/23 / 1 x 14/23                | 150            | 3 315 070 |



# HWS Lid flat flange



## Lid flat flange

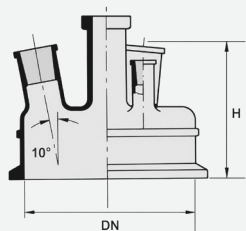
Other executions, also with different nominal widths. Flat discs Standard lids with various socket configurations

| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|----------------|-----------|
| 150            | 45/50                 | 2 x 29/32 / 1 x 14/23                | 150            | 3 315 074 |
| 150            | 45/50                 | 2 x 29/32 / 1 x 19/26                | 150            | 3 315 075 |
| 150            | 45/50                 | 2 x 14/23 / 1 x 29/32                | 150            | 3 315 076 |
| 150            | 45/50                 | 2 x 29/32 / 1 x 29/32                | 150            | 3 315 077 |
| 150            | 45/50                 | — / 4 x 29/32                        | 150            | 3 315 078 |
| 150            | 45/50                 | 2 x 29/32 / 2 x 29/32                | 150            | 3 315 109 |
| 200            | 29/32                 | — / —                                | 150            | 3 320 011 |
| 200            | 29/32                 | — / 1 x 14/23                        | 150            | 3 320 021 |
| 200            | 29/32                 | 2 x 14/23 / —                        | 150            | 3 320 032 |
| 200            | 29/32                 | — / 1 x 29/32                        | 150            | 3 320 033 |
| 200            | 29/32                 | 2 x 29/32 / —                        | 150            | 3 320 034 |
| 200            | 29/32                 | 1 x 29/32 / 3 x 29/32                | 150            | 3 320 035 |
| 200            | 29/32                 | 1 x 14/23 / 1 x 29/32                | 150            | 3 320 041 |
| 200            | 29/32                 | 2 x 29/32 / 1 x 14/23                | 150            | 3 320 042 |
| 200            | 29/32                 | 2 x 29/32 / 1 x 29/32                | 150            | 3 320 043 |
| 200            | 45/50                 | 2 x 29/32 / 2 x 29/32                | 150            | 3 320 060 |
| 200            | 45/50                 | — / —                                | 170            | 3 320 051 |
| 200            | 45/50                 | — / 1 x 14/23                        | 170            | 3 320 052 |



| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|----------------|-----------|
| 200            | 45/40                 | — / 1 x 29/32                        | 170            | 3 320 053 |
| 200            | 45/40                 | 2 x 14/23 / —                        | 170            | 3 320 054 |
| 200            | 45/40                 | 2 x 29/32 / —                        | 170            | 3 320 055 |
| 200            | 45/40                 | 2 x 14/23 / 1 x 14/23                | 170            | 3 320 056 |
| 200            | 45/40                 | 2 x 29/32 / 1 x 14/23                | 170            | 3 320 057 |
| 200            | 45/40                 | 2 x 29/32 / 1 x 29/32                | 170            | 3 320 058 |
| 200            | 45/40                 | 2 x 29/32 / 2 x 29/32                | 170            | 3 320 107 |
| 200            | 45/40                 | — / 4 x 29/32                        | 170            | 3 320 059 |
| 200            | 45/40                 | 4 x 29/32 / —                        | 170            | 3 320 114 |
| 300            | 45/40                 | 3 x 29/32 / 1 x 14/23                | 225            | 3 330 010 |
| 300            | 45/40                 | 3 x 29/32 / 2 x 29/32                | 225            | 3 330 015 |
| 300            | 45/40                 | 3 x 45/40 / 2 x 45/40                | 225            | 3 330 801 |

# HWS Lid flat flange



## Lids with flat flange sockets

Other executions, also with different nominal widths, available.

| Flange<br>(DN) | Centre socket<br>(DN) | Side sockets<br>(Angl. / Parall. NS) | Height<br>(mm) | Cat. No |
|----------------|-----------------------|--------------------------------------|----------------|---------|
| 100            | 15                    | 2xNS29/32 / 1xNS14/23                | 125            | 3310143 |
| 100            | 15                    | 2xNS29/32 / 1xNS29/32                | 125            | 3310144 |
| 120            | 15                    | 2xNS29/32 / 1xNS14/23                | 125            | 3312152 |
| 120            | 15                    | 2xNS29/32 / 1xNS29/32                | 125            | 3312153 |
| 150            | 15                    | 2xNS29/32 / 1xNS14/23                | 150            | 3315142 |
| 150            | 15                    | 2xNS29/32 / 1xNS29/32                | 150            | 3315144 |
| 150            | 25                    | 2xNS29/32 / 1xNS14/23                | 150            | 3315174 |
| 150            | 25                    | 2xNS29/32 / 1xNS29/32                | 150            | 3315177 |
| 200            | 25                    | 2xNS29/32 / 1xNS14/23                | 170            | 3320157 |
| 200            | 25                    | 2xNS29/32 / 1xNS29/32                | 170            | 3320158 |
| 200            | 50                    | 2xDN15 / 1xDN25                      | 170            | 3320170 |
| 200            | 50                    | 2xDN25 / 1xDN15                      | 170            | 3320175 |
| 300            | 50                    | 2xDN50 / DN25/DN15                   | 225            | 3330110 |
| 300            | 50                    | DN80/DN50 / DN25/DN15                | 225            | 3330115 |

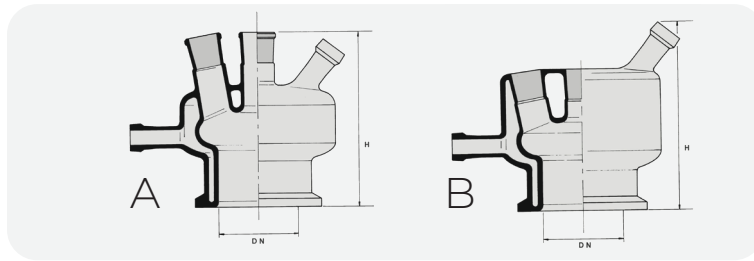


## Jacketed lids

Other executions, also with different nominal widths

| Flange<br>(DN) | Centre socket<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height A<br>(mm) | Height B<br>(mm) | Cat. No   |
|----------------|-----------------------|--------------------------------------|------------------|------------------|-----------|
| 100            | 29/32                 | 3 x 29/32 / —                        | 180              | 140              | 3 328 020 |
| 100            | 29/32                 | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 021 |
| 100            | 29/32                 | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 022 |
| 100            | 45/40                 | 3 x 29/32 / —                        | 180              | 140              | 3 328 051 |
| 100            | 45/40                 | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 052 |
| 100            | 45/40                 | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 053 |
| 120            | 29/32                 | — / 3 x 29/32                        | 180              | 140              | 3 328 219 |
| 120            | 29/32                 | 3 x 29/32 / —                        | 180              | 140              | 3 328 220 |
| 120            | 29/32                 | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 221 |
| 120            | 29/32                 | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 222 |
| 120            | 45/40                 | — / 3 x 29/32                        | 180              | 140              | 3 328 250 |
| 120            | 45/40                 | 3 x 29/32 / —                        | 180              | 140              | 3 328 251 |
| 120            | 45/40                 | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 252 |
| 120            | 45/40                 | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 253 |
| 150            | 29/32                 | — / 3 x 29/32                        | 180              | 140              | 3 328 519 |
| 150            | 29/32                 | 3 x 29/32 / —                        | 180              | 140              | 3 328 520 |
| 150            | 29/32                 | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 521 |
| 150            | 29/32                 | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 522 |
| 150            | 45/40                 | — / 3 x 29/32                        | 180              | 140              | 3 328 550 |

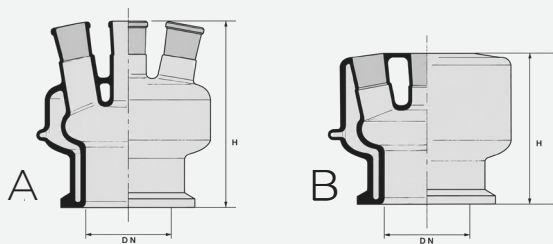
# HWS Lid flat flange



## Jacketed lids

Other executions, also with different nominal widths

| Flange<br>(DN) | Centre soc.<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height A<br>(mm) | Height B<br>(mm) | Cat. No   |
|----------------|---------------------|--------------------------------------|------------------|------------------|-----------|
| 150            | 45/40               | 3 x 29/32 / —                        | 180              | 140              | 3 328 551 |
| 150            | 45/40               | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 552 |
| 150            | 45/40               | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 553 |
| 200            | 29/32               | — / 3 x 29/32                        | 180              | 140              | 3 328 919 |
| 200            | 29/32               | 3 x 29/32 / —                        | 180              | 140              | 3 328 920 |
| 200            | 29/32               | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 921 |
| 200            | 29/32               | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 922 |
| 200            | 45/40               | — / 3 x 29/32                        | 180              | 140              | 3 328 950 |
| 200            | 45/40               | 3 x 29/32 / —                        | 180              | 140              | 3 328 951 |
| 200            | 45/40               | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 328 952 |
| 200            | 45/40               | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 328 953 |

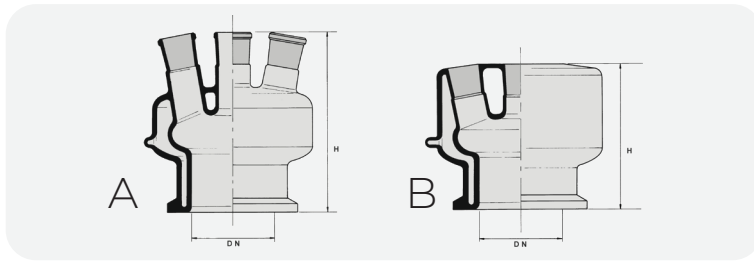


## Evacuated lids

Other executions, also with different nominal widths, available, Infos at page III

| Flange (DN) | Centre socket (NS) | Side sockets (Angl. / Parall. NS) | Height A (mm) | Height B (mm) | Cat. No   |
|-------------|--------------------|-----------------------------------|---------------|---------------|-----------|
| 100         | 29/32              | 3 x 29/32 / —                     | 180           | 140           | 3 326 020 |
| 100         | 29/32              | 2 x 29/32 / 1 x 29/32             | 180           | 140           | 3 326 021 |
| 100         | 29/32              | 1 x 29/32 / 2 x 29/32             | 180           | 140           | 3 326 022 |
| 100         | 45/40              | 3 x 29/32 / —                     | 180           | 140           | 3 326 051 |
| 100         | 45/40              | 2 x 29/32 / 1 x 29/32             | 180           | 140           | 3 326 052 |
| 100         | 45/40              | 1 x 29/32 / 2 x 29/32             | 180           | 140           | 3 326 053 |
| 120         | 29/32              | — / 3 x 29/32                     | 180           | 140           | 3 326 219 |
| 120         | 29/32              | 3 x 29/32 / —                     | 180           | 140           | 3 326 220 |
| 120         | 29/32              | 2 x 29/32 / 1 x 29/32             | 180           | 140           | 3 326 221 |
| 120         | 29/32              | 1 x 29/32 / 2 x 29/32             | 180           | 140           | 3 326 222 |
| 120         | 45/40              | — / 3 x 29/32                     | 180           | 140           | 3 326 250 |
| 120         | 45/40              | 3 x 29/32 / —                     | 180           | 140           | 3 326 251 |
| 120         | 45/40              | 2 x 29/32 / 1 x 29/32             | 180           | 140           | 3 326 252 |
| 120         | 45/40              | 1 x 29/32 / 2 x 29/32             | 180           | 140           | 3 326 253 |
| 150         | 29/32              | — / 3 x 29/32                     | 180           | 140           | 3 326 519 |
| 150         | 29/32              | 3 x 29/32 / —                     | 180           | 140           | 3 326 520 |
| 150         | 29/32              | 2 x 29/32 / 1 x 29/32             | 180           | 140           | 3 326 521 |
| 150         | 29/32              | 1 x 29/32 / 2 x 29/32             | 180           | 140           | 3 326 522 |
| 150         | 45/40              | — / 3 x 29/32                     | 180           | 140           | 3 326 550 |

# HWS Lid flat flange

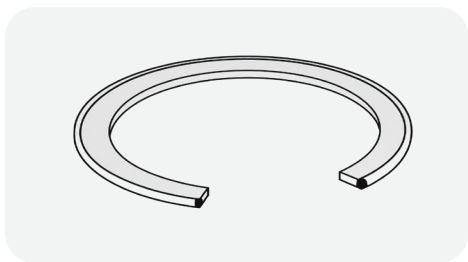


## Evacuated lids

Other executions, also with different nominal widths, available, Infos at page III

| Flange<br>(DN) | Centre soc.<br>(NS) | Side sockets<br>(Angl. / Parall. NS) | Height A<br>(mm) | Height B<br>(mm) | Cat. No   |
|----------------|---------------------|--------------------------------------|------------------|------------------|-----------|
| 150            | 45/40               | 3 x 29/32 / —                        | 180              | 140              | 3 326 551 |
| 150            | 45/40               | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 326 552 |
| 150            | 45/40               | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 326 553 |
| 200            | 29/32               | — / 3 x 29/32                        | 180              | 140              | 3 326 919 |
| 200            | 29/32               | 3 x 29/32 / —                        | 180              | 140              | 3 326 920 |
| 200            | 29/32               | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 326 921 |
| 200            | 29/32               | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 326 922 |
| 200            | 45/40               | — / 3 x 29/32                        | 180              | 140              | 3 326 950 |
| 200            | 45/40               | 3 x 29/32 / —                        | 180              | 140              | 3 326 951 |
| 200            | 45/40               | 2 x 29/32 / 1 x 29/32                | 180              | 140              | 3 326 952 |
| 200            | 45/40               | 1 x 29/32 / 2 x 29/32                | 180              | 140              | 3 326 953 |

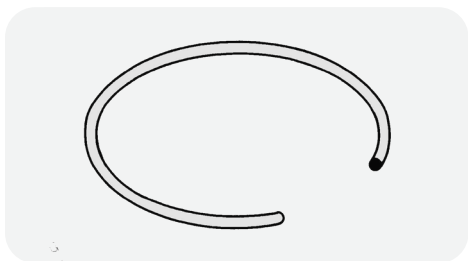
# HWS Seals



## Flat Flange Vessel Seal

Consists of a PTFE supporting ring and a seal O-Ring.  
Available for DN 50-200.

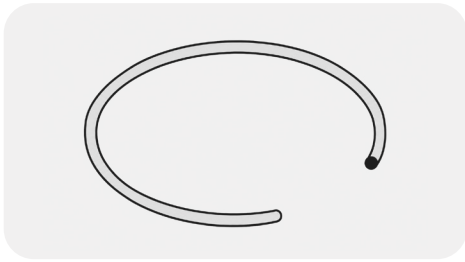
| Nom. Width | Diameter Ø (mm) | Height | Cat. No   |
|------------|-----------------|--------|-----------|
| 50         | 5               | 4      | 3 330 5** |
| 60         | 5               | 4      | 3 330 6** |
| 100        | 5               | 4      | 3 331 0** |
| 120        | 5               | 4      | 3 331 2** |
| 150        | 5               | 4      | 3 331 5** |
| 200        | 5               | 4      | 3 332 0** |



## Viton O-Ring

Consists of a PTFE supporting ring and a seal O-Ring.  
Available for DN 50-200.

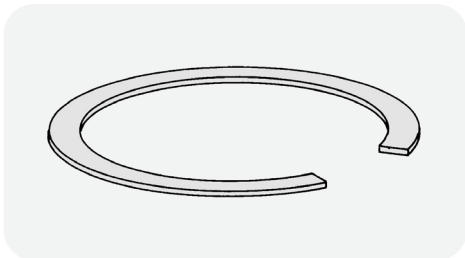
| Nom. Width | Diameter Ø (mm) | Height | Cat. No   |
|------------|-----------------|--------|-----------|
| 50         | 5               | 4      | 3 330 5** |
| 60         | 5               | 4      | 3 330 6** |
| 100        | 5               | 4      | 3 331 0** |
| 120        | 5               | 4      | 3 331 2** |
| 150        | 5               | 4      | 3 331 5** |
| 200        | 5               | 4      | 3 332 0** |



## Spare-O-rings

Consists of a PTFE supporting ring and a seal O-Ring.  
Available for DN 50-200.

| Nom. Width | Diameter Ø (mm) | Cat. No   |
|------------|-----------------|-----------|
| 50         | 5               | 3 340 5** |
| 60         | 5               | 3 340 6** |
| 100        | 5               | 3 341 0** |
| 120        | 5               | 3 341 2** |
| 150        | 5               | 3 341 5** |
| 200        | 5               | 3 342 0** |

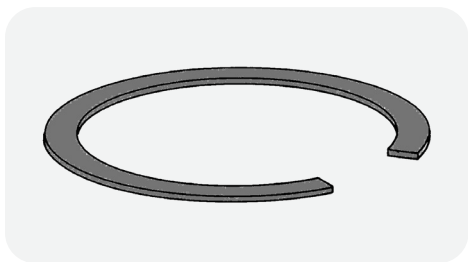


## Flat flange vessel gasket in PTFE

Consists of a PTFE supporting ring and a seal O-Ring.  
Available for DN 50-200.

| Nom. Width | Cat. No   |
|------------|-----------|
| 50         | 3 364 050 |
| 60         | 3 364 060 |
| 100        | 3 364 100 |
| 120        | 3 364 120 |
| 150        | 3 364 150 |
| 200        | 3 364 200 |
| 300        | 3 364 300 |

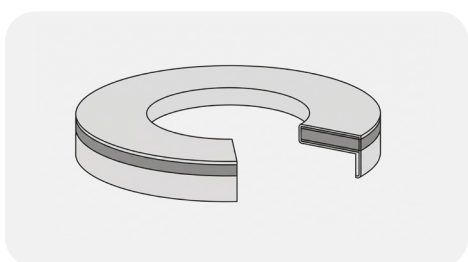




## Graphitized gasket for high temperatures

Graphitized for high temperatures. Multidirectional oriented PTFE, which combines a very effective sealing with cold flow of the material.

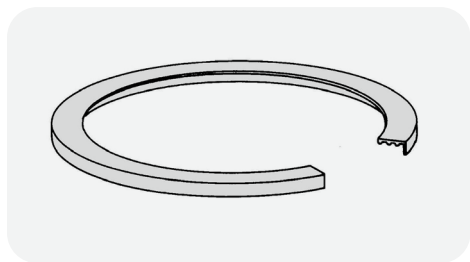
| Nom. Width | Cat. No   |
|------------|-----------|
| 10         | 3 360 010 |
| 15         | 3 360 015 |
| 25         | 3 360 025 |
| 50         | 3 360 050 |
| 60         | 3 360 060 |
| 100        | 3 360 100 |
| 120        | 3 360 120 |
| 150        | 3 360 150 |
| 200        | 3 360 200 |
| 300        | 3 360 300 |



## PTFE/silicone seal for metal adapter

Multidirectional oriented PTFE, which combines a very effective sealing with cold flow of the material.

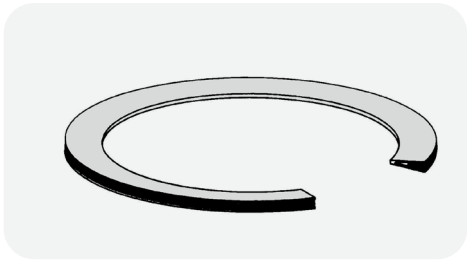
| Nom. Width | Cat. No   |
|------------|-----------|
| 10         | 3 387 110 |
| 15         | 3 387 115 |
| 25         | 3 387 125 |



## PTFE gasket with groove

Multidirectional oriented PTFE, which combines a very effective sealing with cold flow of the material.

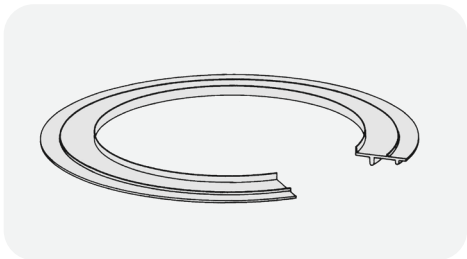
| Nom. Width | Cat. No   |
|------------|-----------|
| 10         | 3 375 010 |
| 15         | 3 375 015 |
| 25         | 3 375 025 |
| 40         | —         |
| 50         | 3 375 050 |
| 60         | 3 375 060 |
| 80         | 3 375 080 |
| 100        | 3 375 100 |
| 120        | 3 375 120 |
| 150        | 3 375 150 |
| 200        | 3 375 200 |
| 300        | 3 375 300 |



### PTFE gasket with insert

Multidirectional oriented PTFE, which combines a very effective sealing with cold flow of the material.

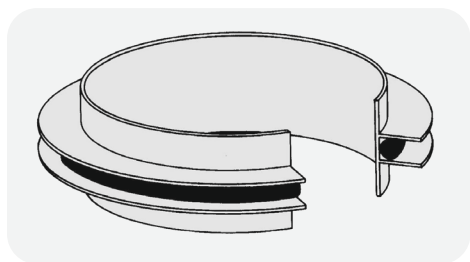
| Nom. Width | Cat. No   |
|------------|-----------|
| 50         | 3 390 050 |
| 60         | 3 390 060 |
| 100        | 3 390 100 |
| 120        | 3 390 120 |
| 150        | 3 390 150 |
| 160        | 3 390 160 |
| 200        | 3 390 200 |



### PTFE gasket with groove

Multidirectional oriented PTFE, which combines a very effective sealing with cold flow of the material.

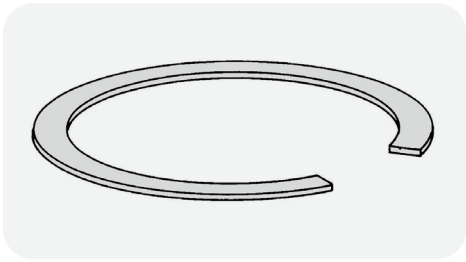
| Nom. Width | Cat. No   |
|------------|-----------|
| 60         | 3 395 060 |
| 100        | 3 395 100 |
| 120        | 3 395 120 |
| 150        | 3 395 150 |
| 200        | 3 395 200 |



## PTFE gasket with O-ring insert

Consists of a PTFE supporting ring and a seal O-Ring.  
Available for DN 50-200.

| Nom. Width | Cat. No   |
|------------|-----------|
| 10         | 3 391 010 |
| 15         | 3 391 015 |
| 25         | 3 391 025 |
| 40         | 3 391 040 |
| 50         | 3 391 050 |
| 60         | 3 391 060 |
| 80         | 3 391 080 |
| 100        | 3 391 100 |



## ePTFE gasket

Multidirectional oriented PTFE, which combines a very effective sealing with cold flow of the material.

| Nom. Width | Cat. No   |
|------------|-----------|
| 10         | 3 375 010 |
| 15         | 3 375 015 |
| 25         | 3 375 025 |
| 40         | 3 375 040 |
| 50         | 3 375 050 |
| 60         | 3 375 060 |
| 80         | 3 375 080 |
| 100        | 3 375 100 |
| 120        | 3 375 120 |
| 150        | 3 375 150 |
| 200        | 3 375 200 |
| 300        | 3 375 300 |

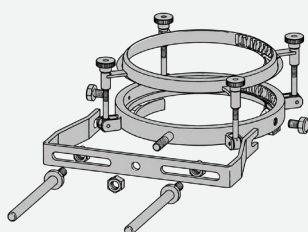
# HWS Supporting device



## Standard Supporting Device

Stainless steel material. With 2 support rods (NW 50: 1 rod), for firm mounting of lid or vessel.

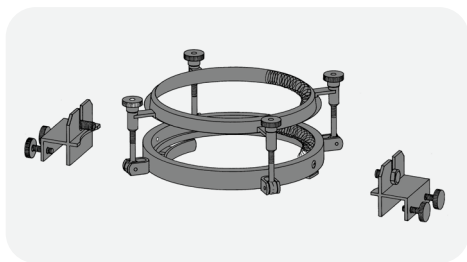
| Nom. Width<br>(mm) | Screws | Support<br>(mm) | Cat. No<br>(HWS) | Cat. No<br>(S) |
|--------------------|--------|-----------------|------------------|----------------|
| 50                 | 3 x M5 | —               | 3 400 050        | —              |
| 60                 | 4 x M6 | 80              | 3 400 060        | 3 400 061      |
| 100                | 4 x M6 | 160             | 3 400 100        | 3 400 101      |
| 120                | 4 x M6 | 160             | 3 400 120        | 3 400 121      |
| 150                | 4 x M6 | 160             | 3 400 150        | 3 400 151      |
| 200                | 4 x M6 | 160             | 3 400 200        | 3 400 201      |



## Universal Supporting Device

Massive execution, for firm mounting with support rods or wall mounting.

| Nom. Width<br>(mm) | Screws | Cat. No<br>(HWS) | Cat. No<br>(S) |
|--------------------|--------|------------------|----------------|
| 60                 | 4 x M6 | 3 410 060        | 3 410 061      |
| 100                | 4 x M6 | 3 410 100        | 3 410 101      |
| 120                | 4 x M6 | 3 410 120        | 3 410 121      |
| 150                | 4 x M6 | 3 410 150        | 3 410 151      |
| 200                | 4 x M6 | 3 410 200        | 3 410 201      |



## Hanging Supporting Device

Massive execution, for mounting in supporting construction, complete with 2 support brackets.

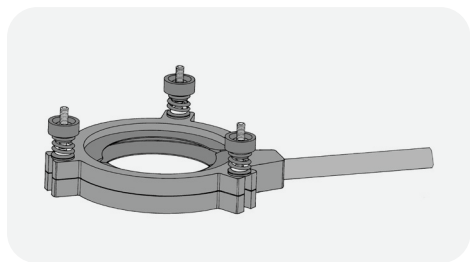
### System “HWS”

| Nom. Width<br>(mm) | Screws | Cat. No<br>(Ø 13 mm) | Cat. No<br>(Ø 21 mm) | Cat. No<br>(Ø 27 mm) | Cat. No<br>(Ø 30 mm) |
|--------------------|--------|----------------------|----------------------|----------------------|----------------------|
| 50                 | 4 x M5 | 3 412 050            | —                    | —                    | —                    |
| 60                 | 4 x M6 | 3 412 060            | 3 412 063            | 3 412 061            | —                    |
| 100                | 4 x M6 | 3 412 100            | 3 412 103            | 3 412 101            | 3 412 102            |
| 120                | 4 x M6 | 3 412 120            | 3 412 123            | 3 412 121            | 3 412 122            |
| 150                | 4 x M6 | 3 412 150            | 3 412 153            | 3 412 151            | 3 412 152            |
| 200                | 4 x M6 | 3 412 200            | 3 412 203            | 3 412 201            | 3 412 202            |
| 300                | 6 x M6 | —                    | —                    | 3 412 301            | 3 412 302            |

### System “S”

| Nom. Width<br>(mm) | Screws | Cat. No<br>(Ø 13 mm) | Cat. No<br>(Ø 21 mm) | Cat. No<br>(Ø 27 mm) | Cat. No<br>(Ø 30 mm) |
|--------------------|--------|----------------------|----------------------|----------------------|----------------------|
| 60                 | 4 x M5 | 3 412 065            | 3 412 068            | 3 412 066            | —                    |
| 100                | 4 x M6 | 3 412 105            | 3 412 108            | 3 412 106            | 3 412 107            |
| 120                | 4 x M6 | 3 412 125            | 3 412 128            | 3 412 126            | 3 412 127            |
| 150                | 4 x M6 | 3 412 155            | 3 412 158            | 3 412 156            | 3 412 157            |
| 200                | 4 x M6 | 3 412 205            | 3 412 208            | 3 412 206            | 3 412 207            |

# HWS Supporting device



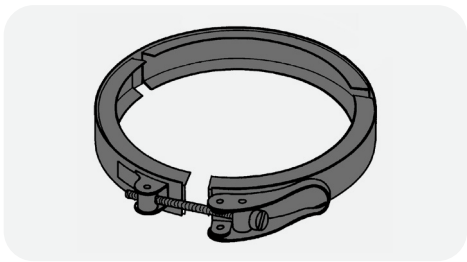
## Supporting Device in Polyester

HWS-Supporting device for reaction vessels in polyester.

| Nom. Width<br>(mm) | Number of rods | Cat. No<br>(HWS) | Cat. No<br>(S) |
|--------------------|----------------|------------------|----------------|
| 60                 | 1              | 3 418 060        | 3 418 061      |
| 100                | 1              | 3 418 100        | 3 418 101      |
| 120                | 1              | 3 418 120        | 3 418 121      |
| 150                | 2              | 3 418 150        | 3 418 151      |



# HWS-Quick release clamp



## Clamp in stainless steel

HWS-Quick release clamp in stainless steel

| Nom. Width<br>(mm) | Cat. No<br>(HWS) | Cat. No<br>(S) |
|--------------------|------------------|----------------|
| 35                 | —                | 4 421 035      |
| 60                 | 3 420 060        | 4 421 061      |
| 100                | 3 418 100        | 3 418 101      |
| 120                | 3 418 120        | 3 418 121      |
| 150                | 3 418 150        | 3 418 151      |
| 200                | 3 418 200        | 3 418 201      |

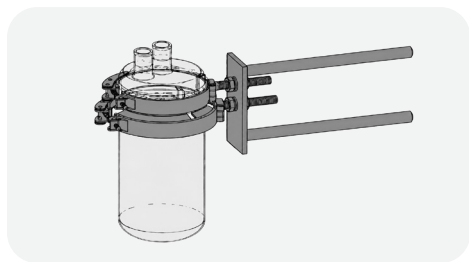


## Clamp in stainless steel, with rods

HWS-Quick release clamp in stainless steel, with 2 support rods

| Nom. Width<br>(mm) | Cat. No<br>(HWS) | Cat. No<br>(S) |
|--------------------|------------------|----------------|
| 35                 | —                | 4 421 035      |
| 60                 | 3 420 060        | 4 421 061      |
| 100                | 3 418 100        | 3 418 101      |
| 120                | 3 418 120        | 3 418 121      |
| 150                | 3 418 150        | 3 418 151      |
| 200                | 3 418 200        | 3 418 201      |

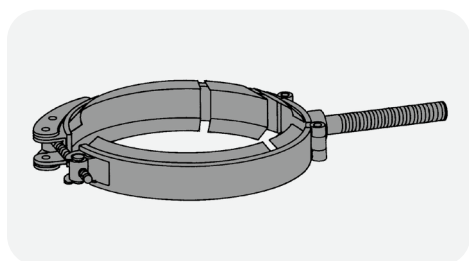
# HWS-Quick fixing



## Vario-Grip complete (Patented)

Supporting device with additional clamping unit allowing removal of vessel or lid without disassembly of accessories. Variable support rods allow horizontal or vertical mounting.

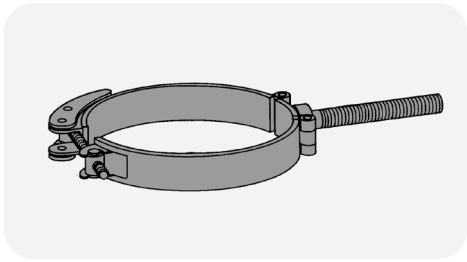
| Nom. Width<br>(mm) | Cat. No<br>(HWS) | Cat. No<br>(S) |
|--------------------|------------------|----------------|
| 60                 | 3 435 060        | 3 435 061      |
| 100                | 3 435 100        | 3 435 101      |
| 120                | 3 435 120        | 3 435 121      |
| 150                | 3 435 150        | 3 435 151      |
| 200                | 3 435 200        | 3 435 201      |



## Closure ring in stainless steel

Parts for "Vario-Grip" and support sides are interchangeable giving great flexibility in use.

| Nom. Width<br>(mm) | Cat. No<br>(HWS) | Cat. No<br>(S) |
|--------------------|------------------|----------------|
| 60                 | 3 437 060        | 3 438 061      |
| 100                | 3 437 100        | 3 438 101      |
| 120                | 3 437 120        | 3 438 121      |
| 150                | 3 437 150        | 3 438 151      |
| 200                | 3 437 200        | 3 438 201      |

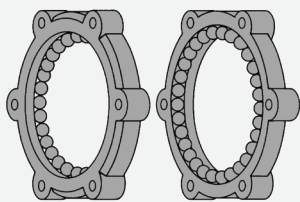


## Vario-Grip complete (Patented)

HWS - "Vario-Grip" can be easily adjusted to the required nominal width by exchange of closure ring and holding ring at the basic part.

| Nom. Width<br>(mm) | Cat. No   |
|--------------------|-----------|
| 60                 | 3 439 060 |
| 100                | 3 439 100 |
| 120                | 3 439 120 |
| 150                | 3 439 150 |
| 200                | 3 439 200 |

# HWS-Clamp connection



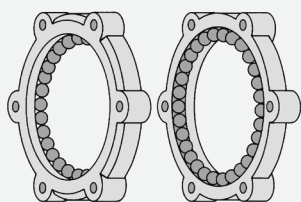
## Resistant phenolic resin

Consisting of 2 rings and 2 additions in 2 executions.

- execution A: coil in s/s
- execution B: in plastic (Duroplast)

Max. operating temperature: 200°C

| Nom. Width<br>(mm) | Diameter Ext.<br>(Ø mm) | Cat. No<br>(A) | Cat. No<br>(B) |
|--------------------|-------------------------|----------------|----------------|
| 10                 | —                       | —              | 3 440 010      |
| 15                 | 64                      | —              | 3 440 015      |
| 25                 | 92                      | —              | 3 440 025      |
| 40                 | —                       | —              | 3 440 040      |
| 50                 | 131                     | 3 442 050      | 3 440 050      |
| 80                 | —                       | 3 442 080      | 3 440 080      |
| 100                | 192                     | 3 442 100      | 3 440 100      |
| 150                | 247                     | 3 442 150      | 3 440 150      |
| 200                | 307                     | 3 442 200      | 3 440 200      |
| 300                | 425                     | 3 442 300      | 3 440 300      |



## Silumin for use up to 200 °C

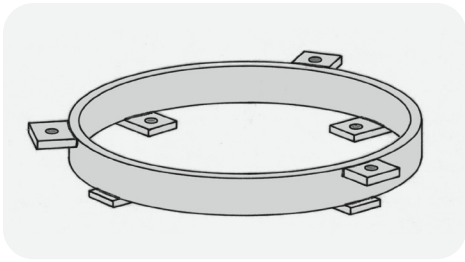
Consisting of 2 rings and 2 additions in 2 executions.

- execution A: coil in s/s
- execution B: in plastic (Duroplast)

Max. operating temperature: 200°C

| Nom. Width<br>(mm) | Diameter Ext.<br>(Ø mm) | Cat. No<br>(A) | Cat. No<br>(B) |
|--------------------|-------------------------|----------------|----------------|
| 15                 | 64                      | —              | 3 441 015      |
| 25                 | 92                      | —              | 3 441 025      |
| 40                 | —                       | —              | 3 441 040      |
| 50                 | 131                     | 3 443 050      | 3 441 050      |
| 80                 | —                       | 3 443 080      | 3 441 080      |
| 100                | 192                     | 3 443 100      | 3 441 100      |
| 150                | 247                     | 3 443 150      | 3 441 150      |
| 200                | 307                     | 3 443 200      | 3 441 200      |
| 300                | 425                     | 3 443 300      | 3 441 300      |

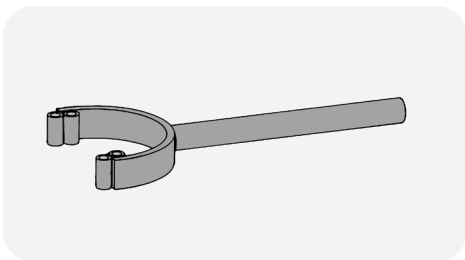
# HWS-Supporting ring



## Supporting ring

For the use of clamp connections in HWS frames.

| Nom. Width<br>(mm) | Cat. No<br>(Steel) | Cat. No<br>(Stainless steel) |
|--------------------|--------------------|------------------------------|
| 100                | 3 445 100          | 3 445 101                    |
| 150                | 3 445 150          | 3 445 151                    |
| 200                | 3 445 200          | 3 445 201                    |
| 300                | 3 445 300          | 3 445 301                    |

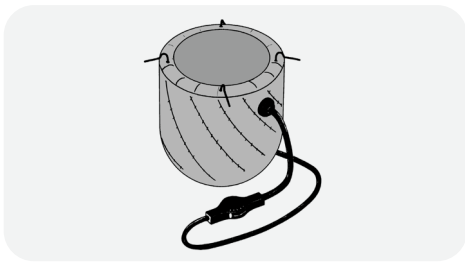


## Supporting fork

For the use of clamp connections in HWS frames.

| Nom. Width<br>(mm) | Cat. No<br>(Steel) | Cat. No<br>(Stainless steel) |
|--------------------|--------------------|------------------------------|
| 50                 | 3 446 050          | 3 446 051                    |
| 80                 | 3 446 080          | 3 446 081                    |
| 100                | 3 446 100          | 3 446 101                    |
| 150                | 3 446 150          | 3 446 151                    |
| 200                | 3 446 200          | 3 446 201                    |
| 300                | 3 446 300          | 3 446 301                    |

# HWS-Heating mantles



## Heating Mantles

For flat flange vessels, available in Types A (standard) and AV (with hole for bottom outlet valve).

| Capacity<br>(ml) | Nom. width<br>(DN) | Type 1 | Cat. No<br>(Type 1) | Type 2 | Cat. No<br>(Type 2) |
|------------------|--------------------|--------|---------------------|--------|---------------------|
| 1000             | 100                | A      | 3 450 110           | AV     | 3 450 111           |
| 2000             | 100                | A      | 3 450 120           | AV     | 3 450 121           |
| 1000             | 120                | A      | 3 450 210           | AV     | 3 450 211           |
| 2000             | 120                | A      | 3 450 220           | AV     | 3 450 221           |
| 1000             | 150                | A      | 3 450 510           | AV     | 3 450 511           |
| 2000             | 150                | A      | 3 450 520           | AV     | 3 450 521           |
| 3000             | 150                | A      | 3 450 530           | AV     | 3 450 531           |
| 4000             | 150                | A      | 3 450 540           | AV     | 3 450 541           |
| 5000             | 150                | A      | 3 450 550           | AV     | 3 450 551           |
| 6000             | 150                | A      | 3 450 560           | AV     | 3 450 561           |
| 10000            | 150                | A      | 3 450 591           | AV     | 3 450 592           |
| 4000             | 200                | A      | 3 452 040           | AV     | 3 452 140           |
| 5000             | 200                | A      | 3 452 050           | AV     | 3 452 150           |
| 6000             | 200                | A      | 3 452 060           | AV     | 3 452 160           |
| 10000            | 200                | A      | 3 452 091           | AV     | 3 452 191           |
| 15000            | 200                | A      | 3 452 092           | AV     | 3 452 192           |
| 20000            | 200                | A      | 3 452 093           | AV     | 3 452 193           |

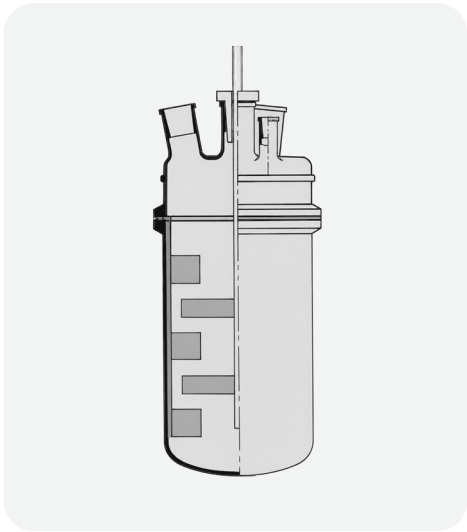
# HWS-Heating mantles

## Heating Mantles

| Capacity<br>(ml) | Nom. width<br>(DN) | Type 1 | Cat. No<br>(Type 1) | Type 2 | Cat. No<br>(Type 2) |
|------------------|--------------------|--------|---------------------|--------|---------------------|
| 6000             | 150/200            | B      | 3 453 060           | BV     | 3 453 061           |
| 10000            | 150/200            | B      | 3 453 091           | BV     | 3 453 191           |
| 15000            | 150/200            | B      | 3 453 092           | BV     | 3 453 192           |
| 20000            | 150/200            | B      | 3 453 093           | BV     | 3 453 193           |



# HWS-Baffle



## Baffle

Available in stainless steel

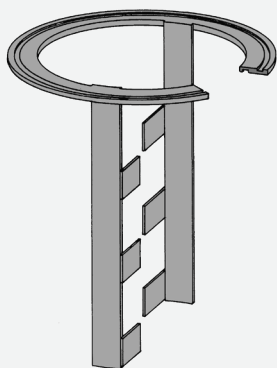
| Nom. Width<br>(mm) | Flow-breaking (baffle)<br>segments | Height<br>(mm) | Cat. No   |
|--------------------|------------------------------------|----------------|-----------|
| 100                | 2                                  | 120            | 3 571 120 |
| 100                | 2                                  | 150            | 3 571 150 |
| 100                | 2                                  | 200            | 3 571 200 |
| 150                | 2                                  | 150            | 3 572 150 |
| 150                | 2                                  | 200            | 3 572 200 |
| 150                | 2                                  | 250            | 3 572 250 |
| 150                | 2                                  | 300            | 3 572 300 |
| 150                | 3                                  | 350            | 3 572 350 |
| 150                | 3                                  | 400            | 3 572 400 |
| 150                | 3                                  | 450            | 3 572 450 |
| 150                | 3                                  | 500            | 3 572 500 |
| 200                | 2                                  | 250            | 3 573 250 |
| 200                | 2                                  | 300            | 3 573 300 |
| 200                | 3                                  | 350            | 3 573 350 |
| 200                | 3                                  | 400            | 3 573 400 |

# HWS-Baffle

## Stirrer shaft

Available in glass

| Nom. Width<br>(mm) | Flow-breaking (baffle)<br>segments | Height<br>(mm) | Cat. No   |
|--------------------|------------------------------------|----------------|-----------|
| 150                | 3                                  | 450            | 3 572 450 |
| 150                | 3                                  | 500            | 3 572 500 |
| 200                | 2                                  | 250            | 3 573 250 |
| 200                | 2                                  | 300            | 3 573 300 |
| 200                | 3                                  | 350            | 3 573 350 |
| 200                | 3                                  | 400            | 3 573 400 |
| 200                | 3                                  | 450            | 3 573 450 |
| 200                | 3                                  | 500            | 3 573 500 |
| 200                | 4                                  | 550            | 3 573 550 |
| 200                | 4                                  | 600            | 3 573 600 |



## Baffle (PFA)

Available in stainless steel / PFA coated

| Nom. Width<br>(mm) | Flow-breaking (baffle)<br>segments | Height<br>(mm) | Cat. No    |
|--------------------|------------------------------------|----------------|------------|
| 100                | 3                                  | 120            | 3 571 120P |
| 100                | 3                                  | 150            | 3 571 150P |
| 100                | 2                                  | 200            | 3 571 200P |
| 150                | 2                                  | 150            | 3 572 150P |
| 150                | 3                                  | 200            | 3 572 200P |
| 150                | 3                                  | 250            | 3 572 250P |
| 150                | 3                                  | 300            | 3 572 300P |
| 150                | 3                                  | 350            | 3 572 350P |
| 150                | 3                                  | 400            | 3 572 400P |
| 150                | 3                                  | 450            | 3 572 450P |
| 150                | 3                                  | 500            | 3 572 500P |
| 200                | 2                                  | 250            | 3 573 250P |
| 200                | 2                                  | 300            | 3 573 300P |
| 200                | 3                                  | 350            | 3 573 350P |
| 200                | 3                                  | 400            | 3 573 400P |

# HWS-Baffle

## Baffle (PFA)

Available in stainless steel / PFA coated

| Nom. Width<br>(mm) | Flow-breaking (baffle)<br>segments | Height<br>(mm) | Cat. No    |
|--------------------|------------------------------------|----------------|------------|
| 200                | 3                                  | 450            | 3 573 450P |
| 200                | 3                                  | 500            | 3 573 500P |
| 200                | 4                                  | 550            | 3 573 550P |
| 200                | 4                                  | 600            | 3 573 600P |

# HWS Supporting Constructions (Frames)



## Close form

In stainless steel tube, height adjustable, with or without caster wheels, with tube for stirrer motor.

| Vessel diam<br>(DN) | Tube<br>(Ø mm) | Size ca.<br>(mm) | Cat. No   |
|---------------------|----------------|------------------|-----------|
| 100                 | 27             | 400 x 400 x 1200 | 3 670 040 |
| 120                 | 27             | 450 x 450 x 1300 | 3 670 045 |
| 150                 | 27             | 500 x 500 x 1500 | 3 670 050 |
| 200                 | 27             | 600 x 600 x 1800 | 3 670 060 |
| 300                 | 27             | 800 x 800 x 2000 | 3 670 080 |

# HWS Supporting Constructions (Frames)

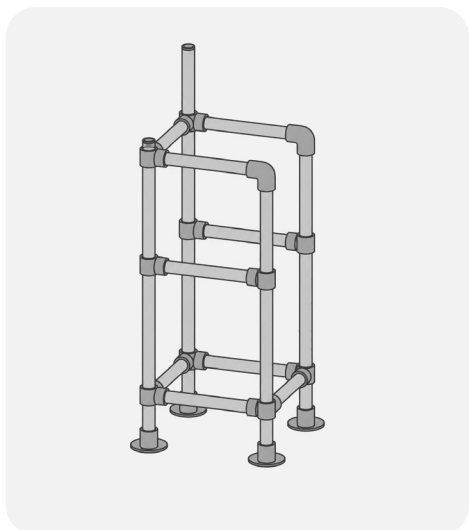


## Open form

Complete frames for multiple units manufactured according to your requirements.

- A: without caster wheel
- B: with caster wheels

| Vessel diam<br>(DN) | Tube<br>(Ø mm) | Size ca.<br>(mm) | Cat. No<br>(A) | Cat. No<br>(B) |
|---------------------|----------------|------------------|----------------|----------------|
| 100                 | 21             | 400 x 400 x 800  | 3 670 810      | 3 670 811      |
| 120                 | 21             | 450 x 450 x 900  | 3 670 812      | 3 670 813      |
| 150                 | 21             | 500 x 500 x 900  | 3 670 815      | 3 670 816      |
| 200                 | 21             | 550 x 550 x 1000 | 3 670 820      | 3 670 821      |
| 100                 | 27             | 400 x 400 x 1200 | 3 670 840      | 3 670 841      |
| 120                 | 27             | 450 x 450 x 1300 | 3 670 845      | 3 670 846      |
| 150                 | 27             | 500 x 500 x 1500 | 3 670 850      | 3 670 851      |
| 200                 | 27             | 600 x 600 x 1800 | 3 670 860      | 3 670 861      |
| 300                 | 27             | 800 x 800 x 2000 | 3 670 880      | 3 670 881      |
| 200                 | 30             | 600 x 600 x 1800 | 3 670 960      | 3 670 961      |
| 300                 | 30             | 800 x 800 x 2000 | 3 670 980      | 3 670 981      |



## Table version

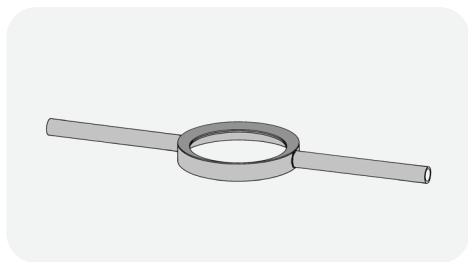
In stainless steel (21mm), height adjustable, with tube for stirrer motor.

| Vessel diam<br>(DN) | Tube<br>(Ø mm) | Height<br>(mm) | Cat. No   |
|---------------------|----------------|----------------|-----------|
| 60                  | 21             | 600            | 3 675 065 |
| 100                 | 21             | 750            | 3 675 105 |
| 120                 | 21             | 750            | 3 675 125 |
| 150                 | 21             | 750            | 3 675 155 |
| 200                 | 21             | 820            | 3 675 205 |
| 300                 | 21             | 900            | 3 675 305 |





# HWS Supporting Accessories



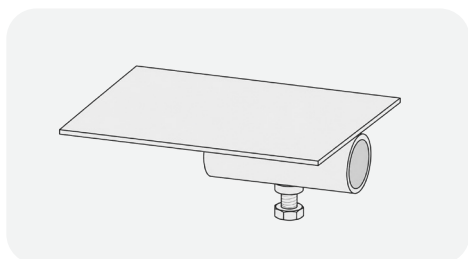
## Supporting rings

Supporting ring for HWS-flat flange vessel in stainless steel, including mounting device.

A: 1 Fixing

B: 2 Fixings

| Ring outer<br>(Ø mm) | Ring inner<br>(Ø mm) | Fixing<br>(DN) | Pour<br>(DN) | Cat. No<br>(A) | Cat. No<br>(B) |
|----------------------|----------------------|----------------|--------------|----------------|----------------|
| 190                  | 150                  | 200 x 27       | 100 / 150    | 3 671 000      | 3 671 010      |
| 250                  | 190                  | 200 x 27       | 150 / 200    | 3 671 020      | 3 671 030      |

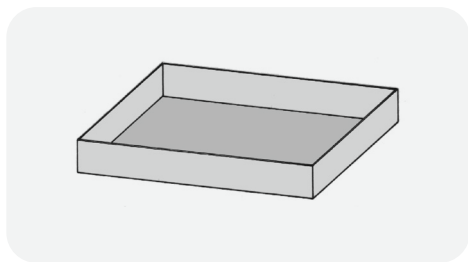


## Table version

In stainless steel (21mm), height adjustable, with tube for stirrer motor.

| Size of shelf<br>(mm) | Fixing<br>(mm) | Cat. No   |
|-----------------------|----------------|-----------|
| 150 x 100             | Ø 27 x 500     | 3 671 200 |
| 200 x 150             | Ø 27 x 500     | 3 671 250 |

# HWS Supporting Accessories



## Shelf with walls

HWS-Shelf with walls, in stainless steel.

**Size  
(mm)**

**Cat. No.**

380 x 380 x 50 x 1,5

3 671 300

480 x 480 x 50 x 1,5

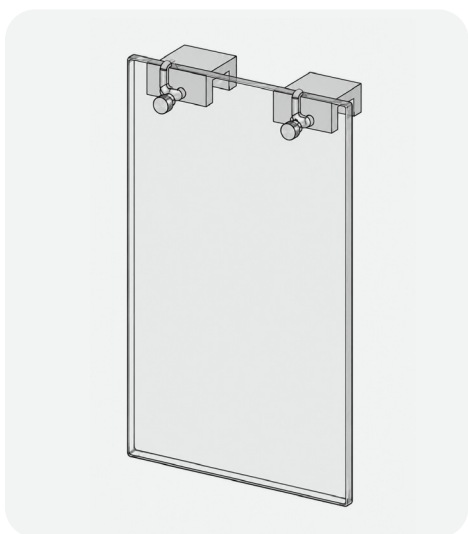
3 671 305

5780 x 580 x 50 x 1,5

3 671 310

780 x 780 x 50 x 1,5

3 671 320



## Polycarbonate protection discs

HWS-Shelf with walls, in stainless steel.

**Size  
(mm)**

**Height  
(mm)**

**Cat. No.**

400

1 200

1 970 40 120/6

500

1 500

1 970 50 150/6

600

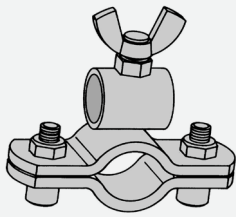
1 800

1 970 60 180/6

800

2 000

1 970 80 200/6

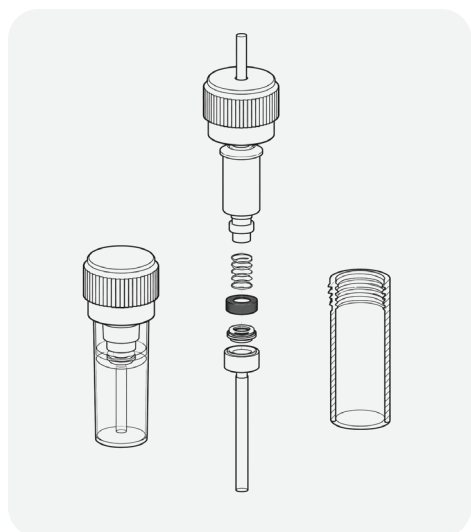


## Tube adapters

Tube adapter in stainless steel (angle 90°)

| For support rod<br>(mm) | Fixing | For tube<br>(mm) | Cat. No      |
|-------------------------|--------|------------------|--------------|
| 13                      | M8     | 21 / 27          | 3 671 113    |
| 16                      | M8     | 21 / 27          | 3 671 116    |
| 20                      | M8     | 21 / 27          | 3 671 120    |
| 27                      | 2 x M8 | 21 / 27          | 3 671 124    |
| 13                      | M8     | 34               | 3 671 134/13 |
| 16                      | M8     | 34               | 3 671 134/16 |
| 27                      | 2 x M8 | 34               | 3 671 134/27 |
| 13                      | M8     | 42               | 3 671 143/13 |
| 16                      | M8     | 42               | 3 671 143/16 |
| 27                      | 2 x M8 | 42               | 3 671 143/27 |

# HWS Dynamic Seals for Stirrers

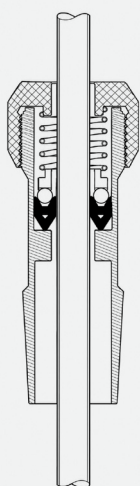


## “DYNA” — Compact Dynamic Seal

A compact stirrer guide for universal use with an integrated needle bearing. Seals in PVDF allow use even under adverse conditions.

- Version A: Standard with PVDF/Perbunan seal
- Version B: With integrated mechanical seal

| Shaft Ø<br>(mm) | Joint<br>(NS) | Cat. No<br>(A) | Cat. No<br>(B) |
|-----------------|---------------|----------------|----------------|
| 10              | 29 / 32       | 3 795 029      | 3 796 029      |
| 10              | 45 / 40       | 3 795 029      | 3 796 029      |
| 16              | 29 / 32       | 3 795 629      | 3 796 629      |
| 16              | 45 / 40       | 3 795 645      | 3 796 645      |

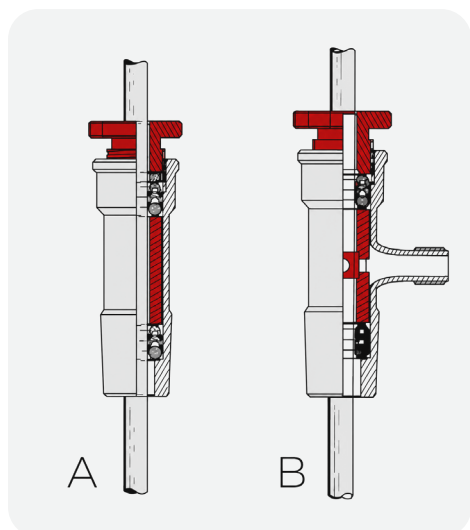


## Self-Adjusting Dynamic Seal (Patented)

A coil in special steel presses the PTFE lips permanently against the shaft and glass body. Can be used under vacuum and slight overpressure. Max. speed: 800 rpm (1000 rpm for short periods).

| Shaft Ø<br>(mm) | Joint<br>(NS) | Cat. No   |
|-----------------|---------------|-----------|
| 10              | 29 / 32       | 3 771 029 |
| 10              | 40 / 38       | 3 771 040 |
| 10              | 45 / 40       | 3 771 045 |
| 16              | 29 / 32       | 3 771 629 |
| 16              | 40 / 38       | 3 771 640 |
| 16              | 45 / 40       | 3 771 645 |

# HWS Dynamic Seals for Stirrers



## Double PTFE Lip Seal (New Generation)

Extended guidance reduces vibrations for longer lifetime.  
Can be used under moderate pressure and vacuum.

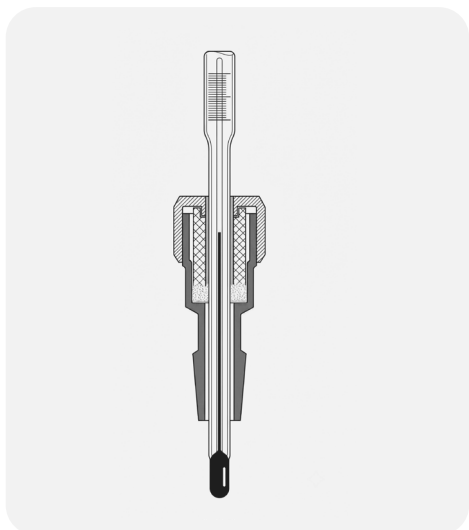
- Version A: Standard
- Version B: With GL 14 at side for gas inlet

\* with extended tube instead of joint

\*\* other execution available

| Shaft Ø<br>(mm) | Joint *<br>(NS) | Cat. No<br>(A) | Cat. No<br>(B) |
|-----------------|-----------------|----------------|----------------|
| 8               | **              | 3 776 000      | 3 776 500      |
| 8               | 29 / 32         | 3 776 029      | 3 776 529      |
| 8               | 40 / 38         | 3 776 040      | 3 776 540      |
| 8               | 45 / 40         | 3 776 045      | 3 776 545      |
| 10              | **              | 3 776 100      | 3 776 600      |
| 10              | 29 / 32         | 3 776 129      | 3 776 629      |
| 10              | 40 / 38         | 3 776 140      | 3 776 640      |
| 10              | 45 / 40         | 3 776 145      | 3 776 645      |
| 14              | 29 / 32         | 3 776 170      | 3 776 670      |
| 14              | 45 / 40         | 3 776 175      | 3 776 675      |
| 16              | **              | 3 776 200      | 3 776 700      |
| 16              | 29 / 32         | 3 776 229      | 3 776 729      |
| 16              | 40 / 38         | 3 776 240      | 3 776 740      |
| 16              | 45 / 40         | 3 776 245      | 3 776 745      |

# HWS Locks (Patented)



## Double PTFE Lip Seal (New Generation)

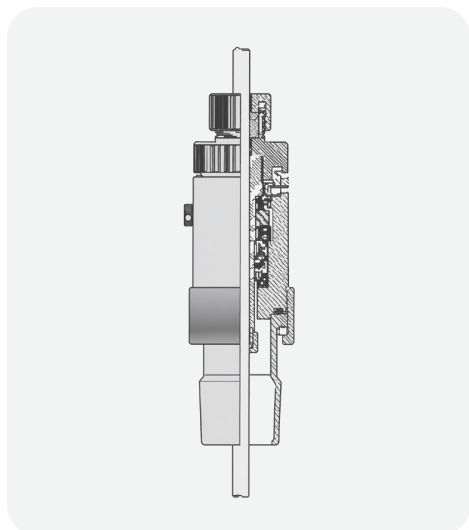
Vacuum-tight feed-through consisting of a silicone O-Ring with PTFE disc protection.

- Model A: Angles changeable from 0 to +4°, angled joint
- Model B: Straight pass

\*\* with extended tube instead of joint

| Shaft Ø<br>(mm) | Joint<br>(NS) | Sealing kit | Cat. No<br>(A) | Cat. No<br>(B) |
|-----------------|---------------|-------------|----------------|----------------|
| 2 - 5           | **            | DS 01       | —              | 3 720 005      |
| 2 - 5           | 14 / 23       | DS 01       | —              | 3 721 405      |
| 2 - 5           | 19 / 26       | DS 01       | 3 701 905      | 3 721 905      |
| 2 - 5           | 29 / 32       | DS 01       | 3 702 905      | 3 722 905      |
| 5 - 11          | **            | DS 02       | —              | 3 730 011      |
| 5 - 11          | 19 / 26       | DS 02       | 3 711 911      | 3 731 911      |
| 5 - 11          | 29 / 32       | DS 02       | 3 712 911      | 3 732 911      |
| 13              | 29 / 32       | DS 02       | 3 712 913      | 3 732 913      |

# HWS Ceramic Mechanical Seal



## Ceramic mechanical seal

In PTFE compound with 2 encapsulated ball bearings in stainless steel. Ceramic seal surfaces can be used without oil and have high gas tightness. Co-rotating inner sleeve (PEEK or Hastelloy HC4) permits use of stirrers in different materials (particularly suited for coated stirrers). Max. 800 rpm, max. 200°C.

\*\* without glass adapter

| Shaft Ø<br>(mm) | Joint<br>(NS / DN) | Cat. No   |
|-----------------|--------------------|-----------|
| 10              | **                 | 3 792 00  |
| 16              | **                 | 3 792 001 |
| 10              | 29 / 32            | 3 792 029 |
| 10              | 45 / 40            | 3 792 045 |
| 16              | 29 / 32            | 3 792 629 |
| 16              | 45 / 40            | 3 792 645 |
| 10              | DN 15              | 3 792 115 |
| 10              | DN 25              | 3 792 125 |
| 16              | DN 25              | 3 792 725 |
| 16              | DN 40              | 3 792 740 |





# HWS Magnetic Stirrer Couplings



## Vacuum Magnetic Coupling (Stainless Steel)

Absolutely gas-tight and vacuum-proof, acid and alkaline resistant. Max. 2,500 rpm.

Available with torques of 20, 40, 60, and 90 N/cm.

\* also with torque 60 and 90 N/cm

| Joint<br>(NS / DN) | Torque<br>(N/cm)* | Cat. No      |
|--------------------|-------------------|--------------|
| 29 / 32            | 20                | 3 790 029/20 |
| 29 / 32            | 40                | 3 790 029/40 |
| 45 / 40            | 40                | 3 790 045/40 |
| 45 / 40            | 60                | 3 790 045/60 |
| DN 15              | 20                | 3 790 115/20 |
| DN 25              | 40                | 3 790 125/40 |
| DN 50              | 40                | 3 790 150/40 |



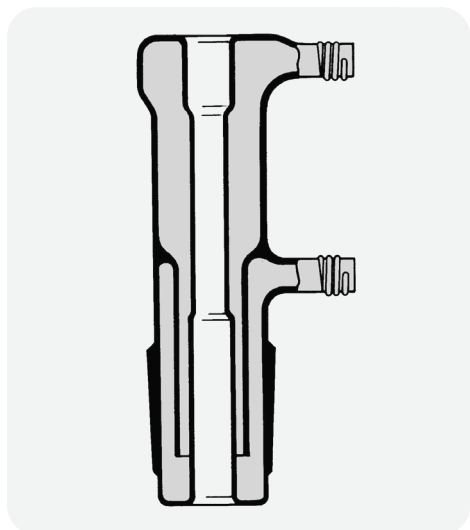
## Glass/PTFE Magnetic Coupling

The right choice when metal cannot be used but high vacuum stability is required.

- Metal-free, without grease
- Compact construction, outer diameter only 35mm
- Speed up to max. 1500 rpm
- Service temperature up to 250°C
- High chemical resistance
- Long-life, exchangeable working bearing

| Joint<br>(NS / DN) | Torque<br>(N/cm)* | Cat. No   |
|--------------------|-------------------|-----------|
| 29 / 32            | 50                | 3 797 129 |
| 45 / 40            | 50                | 3 797 145 |
| DN 25              | 50                | 3 797 225 |
| DN 40              | 50                | 3 797 240 |

# HWS Stirrers



## KPG stirrer bearing with ground joint

Stirrer shaft with roughened clutch driving component and ground sliding surface (160 mm), polished and interchangeable. All models available in stainless steel (1.4571), Hastelloy HC4, or coated (Halar/PFA).

| Shaft Ø<br>(mm) | Joint<br>(NS / DN) | Cat. No   |
|-----------------|--------------------|-----------|
| 10              | 29 / 32            | 3 774 312 |
| 10              | 45 / 40            | 3 774 314 |
| 16              | 29 / 32            | 3 774 315 |
| 16              | 45 / 40            | 3 774 316 |



### Stirrer shaft

Available in glass

| Shaft Ø<br>(mm) | Length<br>(mm) | Total length<br>(mm) | Cat. No   |
|-----------------|----------------|----------------------|-----------|
| 10              | 50             | 260                  | 3 801 050 |
| 10              | 200            | 460                  | 3 801 200 |
| 10              | 50             | 260                  | 3 802 050 |

# HWS Stirrers



## Stirrer shaft

Available in glass

| Shaft Ø<br>(mm) | Total length<br>(mm) | Fitting to NS | Cat. No   |
|-----------------|----------------------|---------------|-----------|
| 10              | 250                  | 19 / 26       | 3 811 250 |
| 10              | 280                  | 29 / 32       | 3 811 280 |
| 10              | 350                  | 45 / 40       | 3 811 350 |
| 10              | 400                  | 45 / 40       | 3 811 400 |
| 16              | 400                  | 45 / 40       | 3 811 406 |
| 16              | 500                  | 60 / 46       | 3 811 506 |

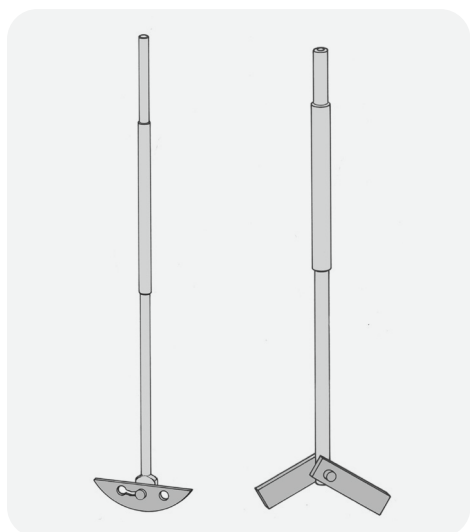


## Gassing stirrer

HWS Gassing stirrer, in glass only for use with dynamic seal with gas inlet (p.35)

| Shaft Ø<br>(mm) | Total length<br>(mm) | Outer diam.<br>(Ø mm) | Cat. No   |
|-----------------|----------------------|-----------------------|-----------|
| 10              | 300                  | 45                    | 3 815 300 |
| 10              | 350                  | 45                    | 3 815 350 |
| 10              | 400                  | 45                    | 3 815 400 |
| 10              | 450                  | 45                    | 3 815 450 |
| 10              | 500                  | 45                    | 3 815 500 |
| 10              | 550                  | 45                    | 3 815 550 |
| 10              | 600                  | 45                    | 3 815 600 |
| 16              | 400                  | 75                    | 3 816 400 |
| 16              | 500                  | 75                    | 3 816 500 |
| 16              | 600                  | 75                    | 3 816 600 |
| 16              | 700                  | 75                    | 3 816 700 |

# HWS Stirrers

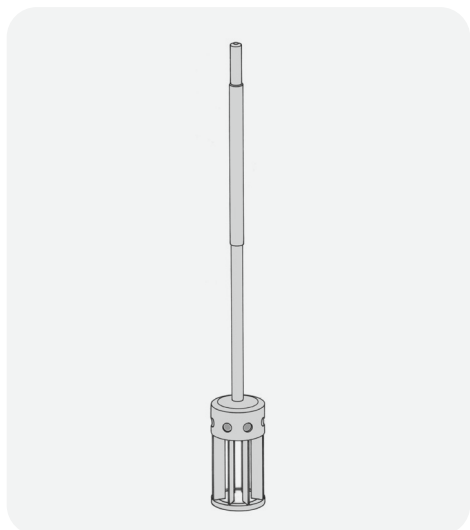


## Stirrer shaft, with paddles

HWS-Stirrer shaft with glass paddles (2 pieces) or PTFE paddle (Halfmoon) particularly suitable for narrow openings

| Shaft Ø<br>(mm) | Total length<br>(mm) | Cat. No<br>(Glass) | Cat. No<br>(PTFE) |
|-----------------|----------------------|--------------------|-------------------|
| 10              | 250                  | 3 822 125          | 3 823 125         |
| 10              | 300                  | 3 822 130          | 3 823 130         |
| 10              | 350                  | 3 822 135          | 3 823 135         |
| 10              | 400                  | 3 822 140          | 3 823 140         |
| 10              | 450                  | 3 822 145          | 3 823 145         |
| 10              | 500                  | 3 822 150          | 3 823 150         |
| 6               | 350                  | 3 822 635          | 3 823 635         |
| 16              | 400                  | 3 822 640          | 3 823 640         |
| 16              | 450                  | 3 823 645          | 3 823 645         |
| 16              | 500                  | 3 822 650          | 3 823 650         |
| 16              | 550                  | 3 822 655          | 3 823 655         |
| 16              | 600                  | 3 822 660          | 3 823 660         |



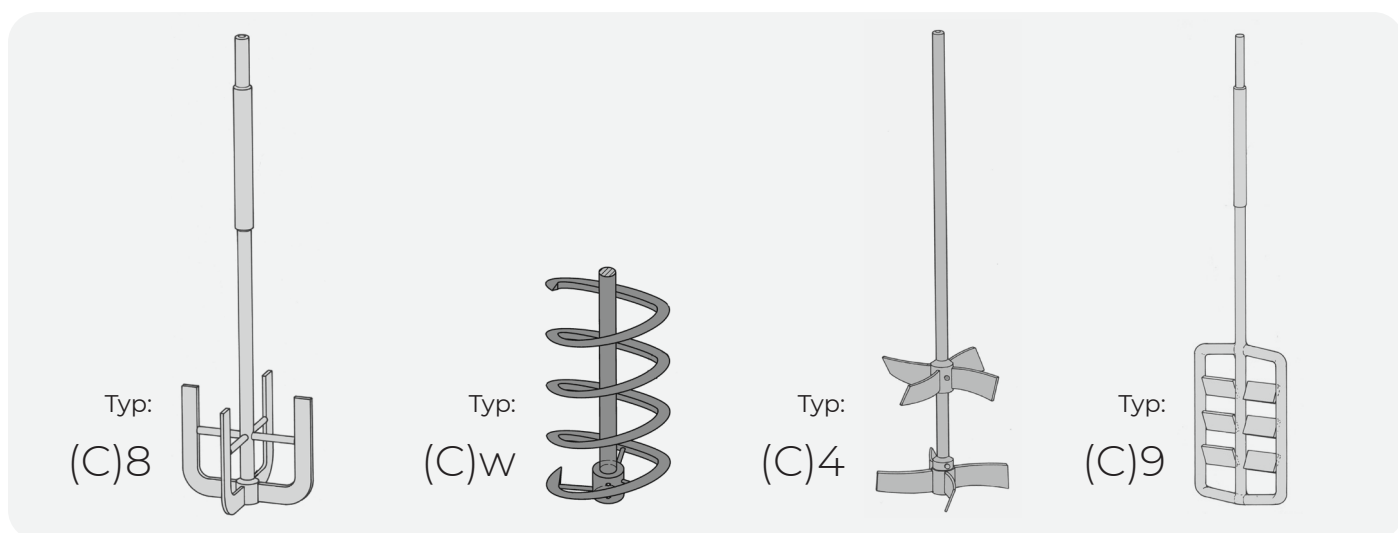


## Stirrer basket type according to Hoesch

Available in glass.

| Shaft Ø<br>(mm) | Total length<br>(mm) | Ext. diam.<br>(Ø mm) | For NS  | Cat. No   |
|-----------------|----------------------|----------------------|---------|-----------|
| 10              | 280                  | 25                   | 29 / 32 | 3 824 280 |
| 10              | 380                  | 25                   | 29 / 32 | 3 824 380 |
| 10              | 280                  | 40                   | 45 / 40 | 3 825 280 |
| 10              | 380                  | 40                   | 45 / 40 | 3 825 380 |
| 10              | 280                  | 52                   | 60 / 46 | 3 826 280 |
| 10              | 380                  | 52                   | 60 / 46 | 3 826 380 |

# HWS Stirrers



## HWS-Stirrers für HWS-flat flange vessels

The suitable stirrer models for HWS-Flat flange vessels are

- stirrers with propeller blades or shafts with an anchor, Ref.: C

These stirrers are available in different lengths:

- different shaft diameters, Ref.: A
- different diameters, Ref.: B
- different materials, Ref.: D
- different connections, Ref.: E

| Length<br>(mm) | Cat. No<br>(A, B, C, D, E) |
|----------------|----------------------------|
| 300            | 3 830 * * * * *            |
| 350            | 3 835 * * * * *            |
| 400            | 3 840 * * * * *            |
| 450            | 3 844 * * * * *            |
| 500            | 3 850 * * * * *            |
| 550            | 3 855 * * * * *            |
| 600            | 3 860 * * * * *            |
| 650            | 3 865 * * * * *            |
| 700            | 3 870 * * * * *            |

| Length<br>(mm) | Cat. No<br>(A, B, C, D, E) |
|----------------|----------------------------|
| 750            | 3 875 * * * * *            |
| 800            | 3 880 * * * * *            |
| 850            | 3 885 * * * * *            |
| 900            | 3 890 * * * * *            |
| 950            | 3 895 * * * * *            |
| 1 000          | 3 900 * * * * *            |
| 1 050          | 3 905 * * * * *            |
| 1 050          | 3 910 * * * * *            |
| 1 150          | 3 915 * * * * *            |

A.

| Shaft Ø<br>(mm) | No. |
|-----------------|-----|
| 8               | 0   |
| 10              | 1   |
| 14              | 4   |
| 16              | 6   |

B.

| Nominal width<br>(mm) | No. |
|-----------------------|-----|
| 50                    | 0   |
| 60                    | 2   |
| 100                   | 1   |
| 120                   | 3   |
| 150                   | 5   |
| 200                   | 9   |
| 300                   | 8   |

C.

#### Modell propeller-arms

| Arms | Nr. |
|------|-----|
| 2    | 0   |
| 3    | 1   |
| 4    | 2   |

#### Add. Plane

| Arms | Nr. |
|------|-----|
| 3    | 3   |
| 4    | 4   |

#### Modell propeller-arms

| Arms | Strut *                | Nr. |
|------|------------------------|-----|
| 2    | -                      | 5   |
| 2    | +                      | 6   |
| 4    | -                      | 7   |
| 4    | +                      | 8   |
| 2    | with slats             | 9   |
| 1    | Spiral stirrer,<br>V4A | w   |

\* For glass stirrers only

\* Glass stirrers only

\* For glass stirrers only

# HWS Stirrers

D.

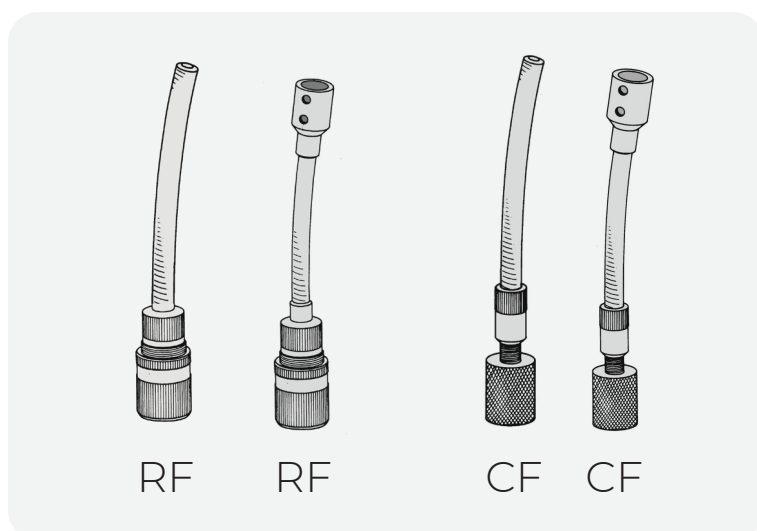
| Sort of material                      | No. |
|---------------------------------------|-----|
| Glass                                 | 0   |
| Stainless steel                       | 1   |
| Stainless steel / Halar-coated        | 2   |
| Stainless steel for magnetic coupling | 3   |
| Stainless steel / PFA-coated          | 5   |
| Stainless steel / glass-coated        | 7   |

E.

| Connection for Stirrers, glass (G) and s/s (M) |   | No. |
|------------------------------------------------|---|-----|
| Round                                          | G | 0   |
| Thread GL10                                    | G | 2   |
| Thread GL 14                                   | G | 1   |
| Knurled                                        | M | 3   |
| One side flat                                  | M | 5   |

Also available: gassing stirrers, paddle stirrers (glass or PTFE), basket stirrers (Hoesch type).

# HWS-couplings for stirrers



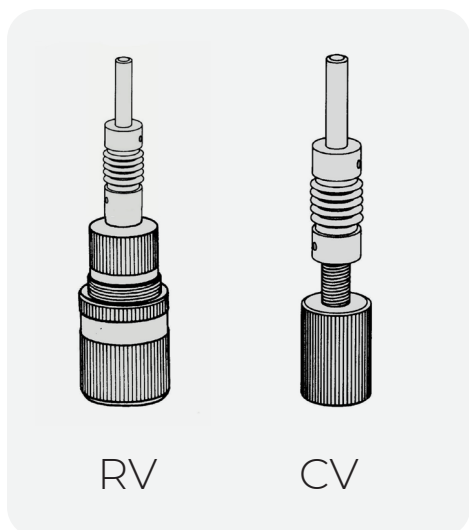
## Couplings with torsion spring

HWS-Couplings for stirrers, patented

With torsion spring for compensation of shaft vibrations. Available for electric (E) and compressed air (D) stirrers.

| Type | Ext. diam.<br>(Ø mm) | For direction          | For NS | Cat. No.  |
|------|----------------------|------------------------|--------|-----------|
| RF   | 6 - 8                | Right/Left, R/L        | E      | 3 950 010 |
| RF   | 6 - 8                | Right/Left, R/L        | D      | 3 950 020 |
| RF   | 12 -14               | Right/Left, R/L        | E      | 3 950 110 |
| RF   | 12 -14               | Right/Left, R/L        | D      | 3 950 120 |
| CF   | 5 - 9                | Right-hand rotation, R | E      | 3 950 210 |
| CF   | 5 - 9                | Right-hand rotation, R | D      | 3 950 220 |

# HWS-couplings for stirrers



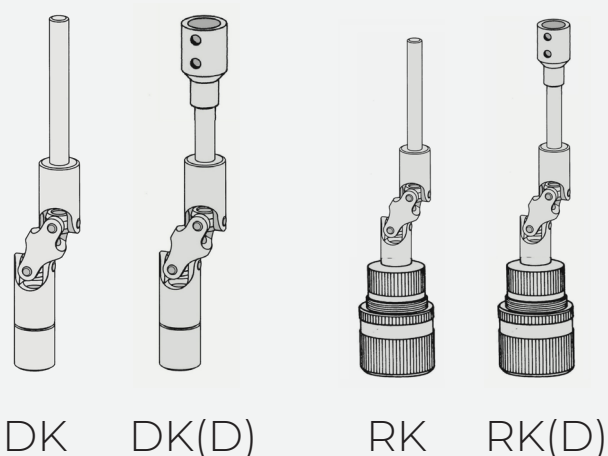
## Couplings with bellow, VA, vibrations

For compensation of extreme. HWS-Couplings for stirrers, patented.

With torsion spring for compensation of shaft vibrations. Available for electric (E) and compressed air (D) stirrers.

Types: RV, CV (bellows)

| Type | Ext. diam.<br>(Ø mm) | For direction          | For NS | Cat. No.  |
|------|----------------------|------------------------|--------|-----------|
| RV   | 6 - 8                | Right/Left, R/L        | E      | 3 950 910 |
| RV   | 6 - 8                | Right/Left, R/L        | D      | 3 950 920 |
| RV   | 12 -14               | Right/Left, R/L        | E      | 3 950 930 |
| RV   | 12 -14               | Right/Left, R/L        | D      | 3 950 940 |
| CV   | 5 - 9                | Right-hand rotation, R | E      | 3 950 950 |
| CV   | 5 - 9                | Right-hand rotation, R | D      | 3 950 960 |



## Couplings with universal joint

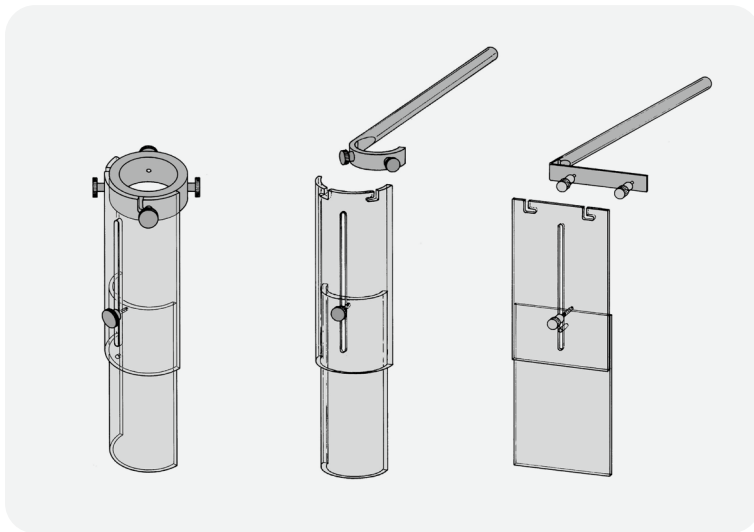
Couplings with universal joint, and screw thread connection.

With torsion spring for compensation of shaft vibrations. Available for electric (E) and compressed air (D) stirrers.

Types: RK, EK, DK (universal joint).

| Type | For stirrers with*<br>(mm) | For direction          | For<br>NS | Cat. No.   |
|------|----------------------------|------------------------|-----------|------------|
| RK   | KPG10 (8 attachment)       | Right/Left, R/L        | E         | 3 950 986  |
| RK   | KPG10 (8 attachment)       | Right/Left, R/L        | D         | 3 950 986D |
| RK   | KPG16 (14 attachment)      | Right/Left, R/L        | E         | 3 950 990  |
| RK   | KPG16 (14 attachment)      | Right/Left, R/L        | D         | 3 950 990D |
| EK   | GL 10                      | Right-hand rotation, R | E         | 3 950 985  |
| EK   | GL 10                      | Right-hand rotation, R | D         | 3 950 985D |
| EK   | GL 14                      | Right-hand rotation, R | E         | 3 950 987  |
| EK   | GL 14                      | Right-hand rotation, R | D         | 3 950 987D |
| DK   | 8 * 1 attachment           | Right/Left, R/L        | E         | 3 950 983  |
| DK   | 8 * 1 attachment           | Right/Left, R/L        | D         | 3 950 983D |
| DK   | 14 * 1 attachment          | Right/Left, R/L        | E         | 3 950 982  |
| DK   | 14 * 1 attachment          | Right/Left, R/L        | D         | 3 950 982D |

# HWS-Shaft protection



## Shaft protection for stirrers \*

In polycarbonate (Makrolon, Lexan), transparent, length adjustable.

Complies with German employers' liability insurance requirements.

Available in half-shell and full-tube executions with various mounting options.

\* according to the requirements of the German employers' liability insurance company

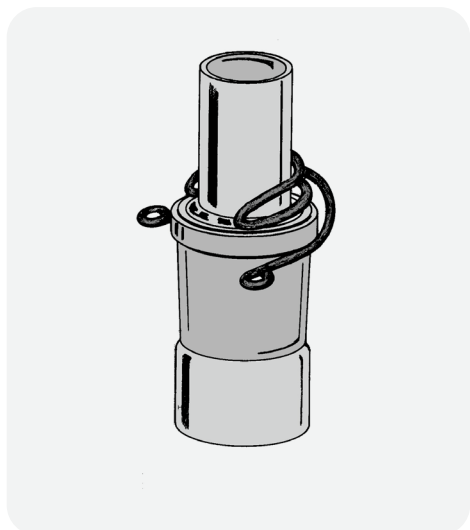
\*\* also available in "Plexiglas" version

\*\*\* only available in "Plexiglas" version

| Type                                                  | Length    | Cat. No.  |
|-------------------------------------------------------|-----------|-----------|
| Half-shell execution with universal mounting ring     | 190 - 310 | 3 950 910 |
| dto., with support rod in stainless steel             | 190 - 310 | 3 995 100 |
| dto., replacement, without ring or support rod        | 190 - 310 | 3 995 001 |
| Half-shell execution with universal mounting ring **  | 220 - 340 | 3 995 300 |
| dto., with support rod in stainless steel **          | 220 - 340 | 3 995 310 |
| dto., replacement, without ring or support rod **     | 220 - 340 | 3 995 320 |
| Tube execution with universal mounting ring ***       | 220 - 340 | 3 996 000 |
| dto., with support rod in stainless steel ***         | 220 - 340 | 3 996 100 |
| plate with support rod in stainless steel B=100mm *** | 185 - 310 | 3 997 100 |
| plate with support rod in stainless steel B=200mm***  | 330 - 600 | 3 997 200 |



# HWS Clips and Clamps

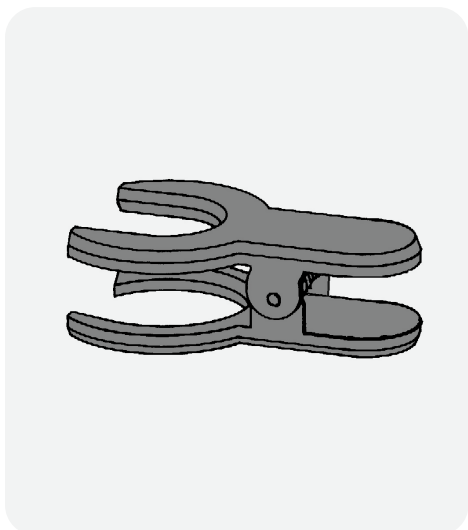


## Clips for Conical Joints (Patented)

Stainless steel wire, for NS 5-85.

| Suitable for NS | Cat. No.  |
|-----------------|-----------|
| 5               | 1 258 100 |
| 7               | 1 258 200 |
| 10              | 1 258 300 |
| 12              | 1 258 400 |
| 14              | 1 258 500 |
| 19              | 1 258 600 |
| 24              | 1 258 700 |
| 29              | 1 258 800 |
| 34              | 1 258 900 |
| 45              | 1 259 000 |
| 60              | 1 259 100 |
| 71              | 1 259 200 |
| 85              | 1 259 300 |

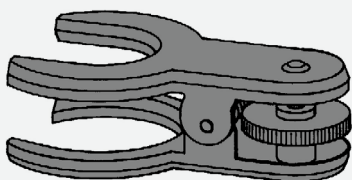
# HWS Clips and Clamps



## Fork Clamps for Spherical Joints

HWS-fork clamps for spherical joints without or with tightening screw. Steel (galvanized) or stainless steel, with or without tightening screw.

| suitable for<br>(KS) | suitable for<br>(S) | Cat. No.<br>(without tightening) | Cat. No<br>(with tightening) |
|----------------------|---------------------|----------------------------------|------------------------------|
| 12/2, 12/5           | 13/2, 13/5          | 1 267 100                        | 1 268 100                    |
| 18/7, 18/9           | 19/9                | 1 267 200                        | 1 268 200                    |
| 28/12, 28/15         | 29/15               | 1 267 300                        | 1 268 300                    |
| 35/20, 35/25         | 35/20, 35/25        | 1 267 400                        | 1 268 400                    |
| 40/25                | 40/25, 41/25        | 1 267 500                        | 1 268 500                    |
| 50/30                | 51/30               | 1 267 600                        | 1 268 600                    |
| 65/40                | 64/40               | 1 267 700                        | 1 268 700                    |

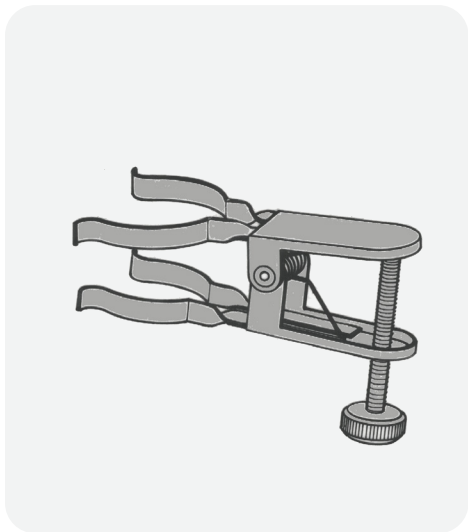


## Fork Clamps for Conical Joints

HWS-fork clamps for spherical joints. Stainless steel, with tightening screw.

| suitable for<br>(KS) | suitable for<br>(S) | Cat. No<br>(with tightening) |
|----------------------|---------------------|------------------------------|
| 12/2, 12/5           | 13/2, 13/5          | 1 269 100                    |
| 18/7, 18/9           | 19/9                | 1 269 200                    |
| 28/12, 28/15         | 29/15               | 1 269 300                    |
| 35/20, 35/25         | 35/20, 35/25        | 1 269 400                    |
| 40/25                | 40/25, 41/25        | 1 269 500                    |
| 50/30                | 51/30               | 1 269 600                    |
| 65/40                | 64/40               | 1 269 700                    |

# HWS Clips and Clamps



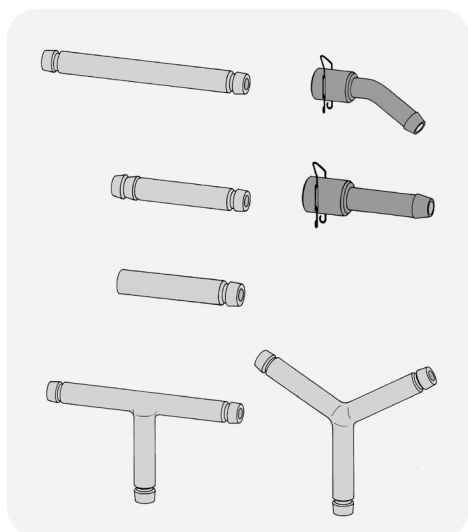
## Fork clamps for conical joints

HWS-fork clamps for conical joints in stainless steel without or with tightening screw

| suitable for<br>(NS) | Cat. No.<br>(without tightening) | Cat. No<br>(with tightening) |
|----------------------|----------------------------------|------------------------------|
| 14                   | 1 276 500                        | 1 277 500                    |
| 19                   | 1 276 600                        | 1 277 600                    |
| 24                   | 1 276 700                        | 1 277 700                    |
| 29                   | 1 276 800                        | 1 277 800                    |
| 45                   | 1 276 900                        | 1 277 900                    |

# HWS Hose Connectors (Patented)

Self-engaging plug connection in polyamide (DN 6) or Hostaflon ET (DN 10) with stainless steel spring clip. Simple, fast handling — unlock and remove in one grip. Swivelling after assembly.

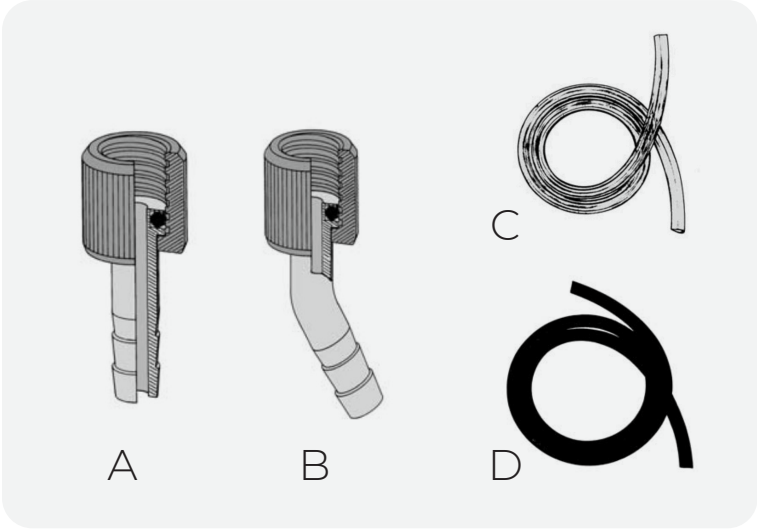


## Screw Hose Connections

For GL 14, GL 18, GL 25 threads. Available in straight and bent versions. Materials: PBT, PP, PTFE-Compound.

| Type                                 | Cat. No.<br>(DN6) | Cat. No.<br>(DN10) |
|--------------------------------------|-------------------|--------------------|
| Plastic hose connector, straight     | 1 288 106         | 1 288 110          |
| Plastic hose connector, angle        | 1 288 200         | —                  |
| Glass olive, single side, ca. 50 mm  | 1 288 406         | 1 288 410          |
| Glass olive, double side, ca. 100 mm | 1 288 506         | 1 288 510          |
| Glass olive (adapter to olive A11)   | 1 288 606         | —                  |
| T-Glass olive                        | 1 288 706         | 1 288 710          |
| Y-Glass olive                        | 1 288 806         | 1 288 810          |

# HWS Hose Connectors (Patented)



## Hoses

- Silicone hose (-60°C to +180°C, max 260°C): Cat. No. 1299 001-005
- Viton hose (-20°C to +200°C): Cat. No. 1 299 011-015
- PTFE hose (-20°C to +200°C): Cat. No. 1 299 108-116

## A (Straight)

| Size (GL) | Cap           | Oliv | Cat. No   |
|-----------|---------------|------|-----------|
| 14        | PBT           | PTFE | 1 289 114 |
| 14        | PBT           | PP   | 1 289 314 |
| 14        | PTFE-Compound | PTFE | 1 289 514 |
| 18        | PBT           | PTFE | 1 289 118 |
| 18        | PBT           | PP   | 1 289 318 |
| 18        | PTFE-Compound | PTFE | 1 289 518 |
| 25        | PBT           | PTFE | 1 289 125 |

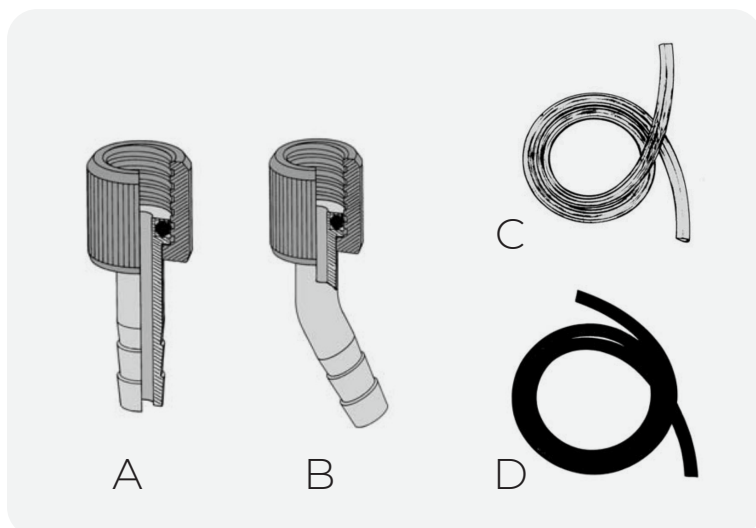
## B (Bent)

| Size<br>(GL) | Cap           | Oliv | Cat. No   |
|--------------|---------------|------|-----------|
| 14           | PBT           | PTFE | 1 289 214 |
| 14           | PBT           | PP   | 1 289 414 |
| 14           | PTFE-Compound | PTFE | 1 289 614 |
| 18           | PBT           | PTFE | 1 289 218 |
| 18           | PBT           | PP   | 1 289 418 |
| 18           | PTFE-Compound | PTFE | 1 289 618 |

## C (Silicone hose, transparent)

| Size<br>(GL) | Cap | Cat. No   |
|--------------|-----|-----------|
| 8            | 12  | 1 299 001 |
| 9            | 13  | 1 299 002 |
| 10           | 14  | 1 299 003 |
| 11           | 15  | 1 299 004 |
| 12           | 16  | 1 299 005 |

# HWS Hose Connectors (Patented)



## Hoses

- Silicone hose (-60°C to +180°C, max 260°C): Cat. No. 1299 001-005
- Viton hose (-20°C to +200°C): Cat. No. 1 299 011-015
- PTFE hose (-20°C to +200°C): Cat. No. 1 299 108-116

## D (Viton hose, black)

| Size<br>(GL) | Cap | Cat. No   |
|--------------|-----|-----------|
| 8            | 12  | 1 299 011 |
| 9            | 13  | 1 299 012 |
| 10           | 14  | 1 299 013 |
| 11           | 15  | 1 299 014 |
| 12           | 16  | 1 299 015 |

## D (PTFE hose)

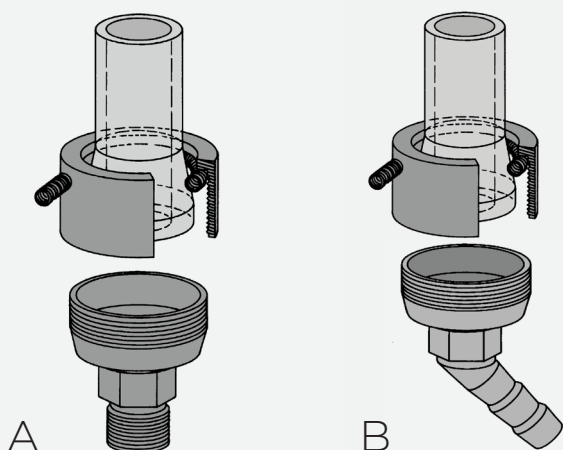
| Size<br>(GL) | Cap | Cat. No   |
|--------------|-----|-----------|
| 8            | 10  | 1 299 108 |
| 10           | 12  | 1 299 110 |
| 12           | 14  | 1 299 112 |
| 14           | 16  | 1 299 114 |
| 16           | 18  | 1 299 116 |



# HWS Metal Adapters

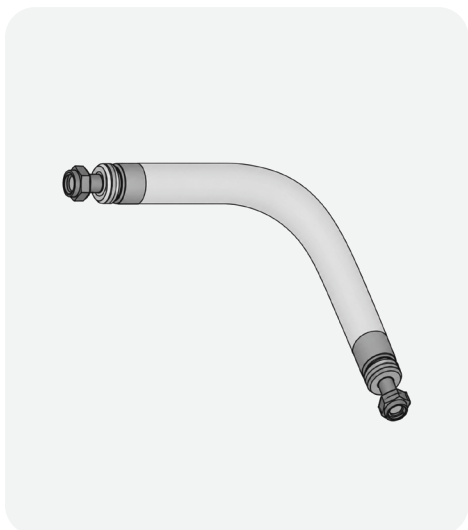
## Insulated Metallic Hoses

With threaded connection M 16x1 or M 30x1.5 for circulators.



| For nom. Width<br>(DN) | Thread     | Olive diam.<br>(Ø mm) | Execution | Cat. No.  |
|------------------------|------------|-----------------------|-----------|-----------|
| 10                     | —          | 11                    | B         | 1 290 017 |
| 15                     | —          | 11                    | B         | 1 290 018 |
| 15                     | —          | 13                    | B         | 1 290 019 |
| 25                     | —          | 22                    | A         | 1 290 038 |
| 10                     | M 16 x 1   | —                     | A         | 1 290 020 |
| 10                     | M 14 x 1,5 | —                     | A         | 1 290 021 |
| 10                     | M 16 x 1   | —                     | B         | 1 290 012 |
| 15                     | M 16 x 1   | —                     | A         | 1 290 023 |
| 15                     | M 14 x 1,5 | —                     | A         | 1 290 024 |
| 15                     | M 16 x 1   | —                     | B         | 1 290 035 |
| 25                     | M 16 x 1   | —                     | A         | 1 290 025 |
| 15                     | M 30 x 1.5 | —                     | A         | 1 290 036 |
| 15                     | M 30 x 1,5 | —                     | B         | 1 290 037 |
| 25                     | M 30 x 1.5 | —                     | A         | 1 290 030 |
| 25                     | M 30 x 1,5 | —                     | B         | 1 290 032 |

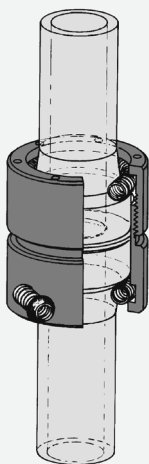
# HWS Metal Accessories



## Flexible metallic hose

Insulated, with threaded connection M 16 x 1 or M 30 x 1,5 for circulators

| Length<br>(m) | Cat. No.<br>(M 16 x 1) | Cat. No.<br>(M 30 x 1,5) |
|---------------|------------------------|--------------------------|
| 0.5           | 1 298 005              | 1 298 305                |
| 1.0           | 1 298 010              | 1 298 310                |
| 1.5           | 1 298 015              | 1 298 315                |
| 2.0           | 1 298 020              | 1 298 320                |
| 3.0           | 1 298 030              | 1 298 330                |



## Double couplings

HWS-Double coupling, stainless steel, for connection of two glass flanges.

| For nom. Width<br>(DN) | Cat. No.  |
|------------------------|-----------|
| 10                     | 1 296 010 |
| 15                     | 1 296 015 |
| 25                     | 1 296 025 |

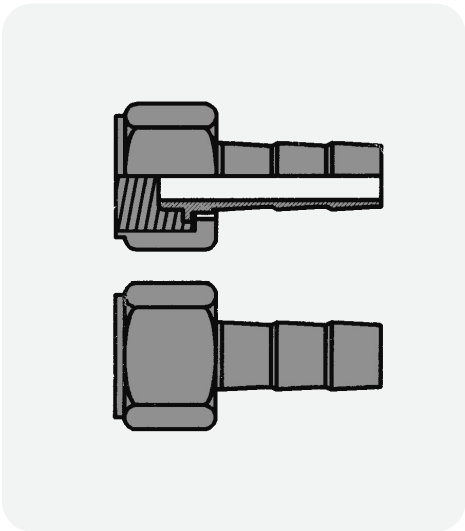
# HWS Metal Accessories



## PIN spanners

PIN-Spanner for HWS-Adapter.

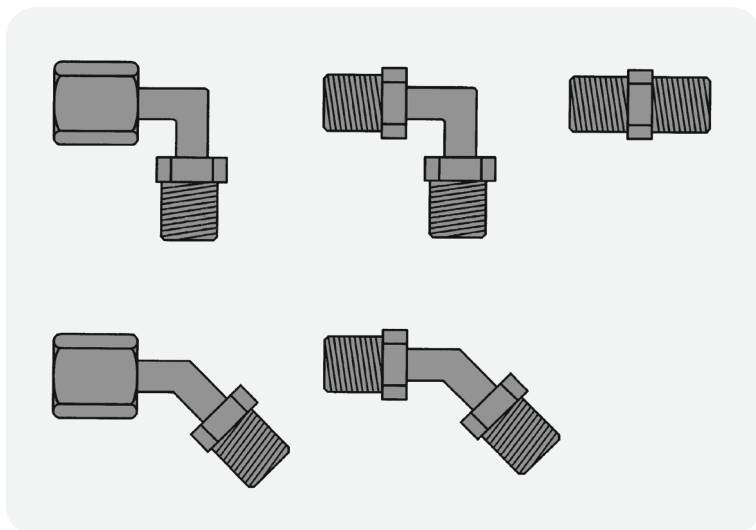
| Length<br>(m) | Cat. No.<br>(Burnished steel) | Cat. No.<br>(stainless steel) |
|---------------|-------------------------------|-------------------------------|
| 10            | 1 296 110                     | 1 296 111                     |
| 15 1 296 115  | 1 296 115                     | 1 296 116                     |
| 25            | 1 296 125                     | 1 296 126                     |



## Olive, V2A

olive for HWS metal adapter

| Thread   | Olive | Cat. No.  |
|----------|-------|-----------|
| M 16 x 1 | A 11  | 1 297 011 |
| M 16 x 1 | A 13  | 1 297 013 |

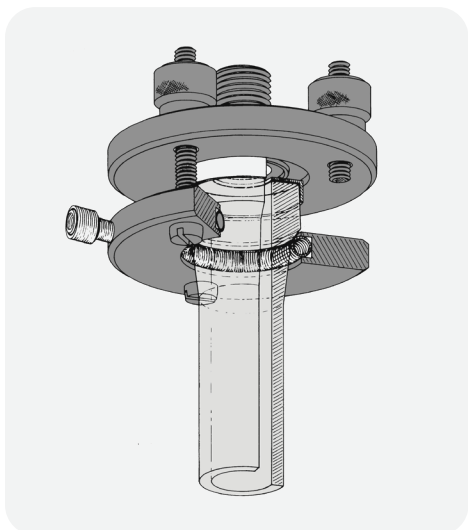


## Adapter

HWS-Adapter, metal material.

| Thread | Thread   | Mother for | Execution | Cat. No.  |
|--------|----------|------------|-----------|-----------|
| M 16x1 | M 16x1   | —          | straight  | 1 291 016 |
| M 16x1 | M 14x1,5 | —          | straight  | 1 291 017 |
| M 16x1 | M 16x1   | —          | 45 °      | 1 291 071 |
| M 16x1 | M 16x1   | —          | 90 °      | 1 291 080 |
| M 16x1 | —        |            | 45 °      | 1 291 091 |
| M 16x1 | —        |            | 90 °      | 1 291 090 |
| M 16x1 | M 10x1   | —          | straight  | 1 291 100 |
| M 16x1 | M 14x1,5 | —          | straight  | 1 291 076 |

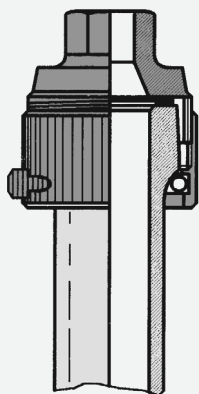
# HWS Metal Accessories



## Adapter

HWS - Adapter, metal, for flexible metallic hose, with stay bolt

| For nom. Width                | Thread     | Cat. No.  |
|-------------------------------|------------|-----------|
| DN 10                         | M 14 x 1,5 | 1 297 110 |
| DN 10                         | M 16 x 1   | 1 297 111 |
| DN 15                         | M 14 x 1,5 | 1 297 115 |
| DN 15                         | M 16x1     | 1 297 116 |
| DN 15 (with oil splash guard) | M 14 x 1,5 | 1 297 117 |



## Bursting disc

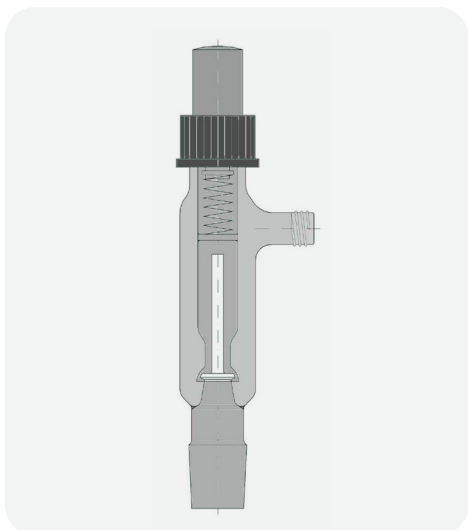
HWS - Adapter, metal, for flexible metallic hose, with stay bolt

| Thread        | Thread | Mother for | Execution | Cat. No.  |
|---------------|--------|------------|-----------|-----------|
| Bursting disc | 15     | 0,5 bar    | 100°      | 1 297 001 |
| Bursting disc | 15     | 1,0 bar    | 100°      | 1 297 002 |
| Bursting disc | 15     | 2,0 bar    | 100°      | 1 297 003 |
| Bursting disc | 15     | 3,0 bar    | 100°      | 1 297 004 |

Burst discs for other pressure and temperature ranges available on request

|                                               | Cat. No.  |
|-----------------------------------------------|-----------|
| Bursting disk holder s/s, NW 15               | 1 297 000 |
| Glass adapter joint to flange NS 29 auf NW 15 | 1 297 002 |
| Glass adapter joint to flange NS 45 auf NW 15 | 1 297 003 |
| Seal PTFE, NW 15                              | 1 297 004 |

# HWS Adapter / Safety valve / Funnel

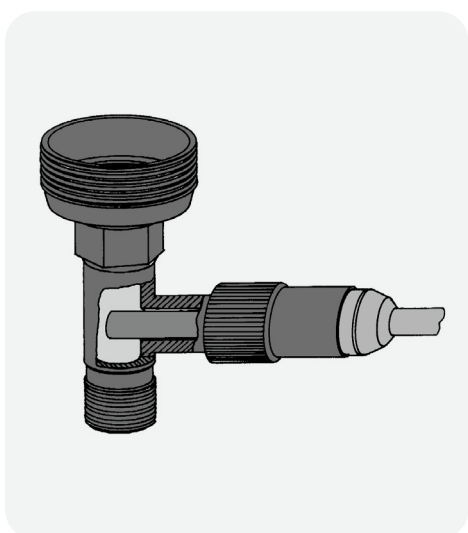


## Over pressure valve

HWS over pressure valve with coil.

\*\* 0.1 bar (01), 0.2 bar (02), 0.3 bar (03), 0.4 bar (04), 0.5 bar (05), 1.0 bar (10)

| For nom. Width | Cat. No.<br>(A) | Cat. No.<br>(B) |
|----------------|-----------------|-----------------|
| NS 29/32       | 0 054 902H/**   | 0 054 902H/**   |
| GL 18          | 0 054 818H/**   | 0 054 818H/**   |
| DN 15          | 0 054 915H/**   | 0 054 915H/**   |
| DN 25          | 0 054 925H/**   | 0 054 925H/**   |

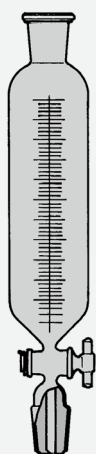


## Adapter PT 100

HWS-Adapter, s/s, with PT 100

| For DN | Thread   | Cat. No.  |
|--------|----------|-----------|
| 10     | M 16 x 1 | 1 290 079 |
| 15     | M 16 x 1 | 1 290 080 |





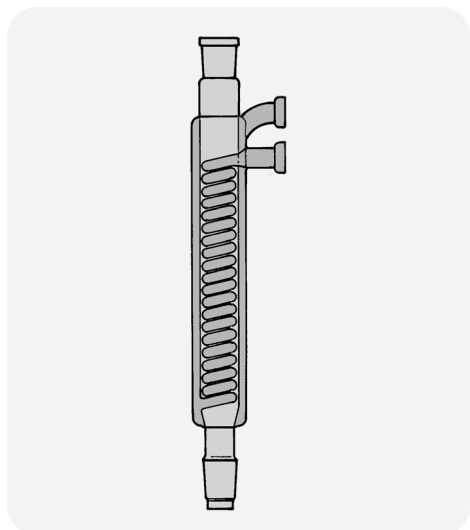
## Dropping funnel

HWS-Dropping funnel in Duran glass, cylindrical, graduated safety stopcock with hollow glass plug and HWS-special safety clamp in stainless steel.

Also available are the following types: not graduated with pressure equalizing tube with PTFE or solid glass plug with large dropping tip

| Size<br>(GL) | Cap  | Oliv | Cat. No   |
|--------------|------|------|-----------|
| 50           | 14.5 | 2.5  | 2 560 514 |
| 50           | 19   | 2.5  | 2 560 519 |
| 50           | 29   | 2.5  | 2 560 529 |
| 100          | 14.5 | 2.5  | 2 561 014 |
| 100          | 19   | 2.5  | 2 561 019 |
| 100          | 29   | 2.5  | 2 561 029 |
| 250          | 14.5 | 4.0  | 2 562 514 |
| 250          | 19   | 4.0  | 2 562 519 |
| 250          | 29   | 4.0  | 2 562 529 |
| 500          | 19   | 4.0  | 2 565 019 |
| 500          | 29   | 4.0  | 2 565 029 |
| 1000         | 19   | 6.0  | 2 569 119 |
| 1000         | 29   | 6.0  | 2 569 129 |
| 2000         | 29   | 8.0  | 2 569 129 |
| 5000         | 29   | 10.0 | 2 569 529 |
| 5000         | 45   | 10.0 | 2 569 545 |

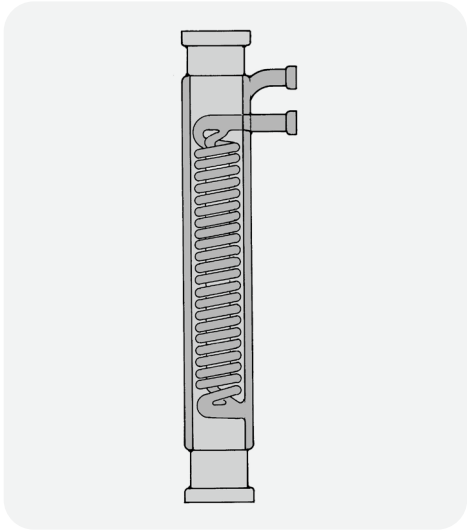
# HWS Heat exchanger



## Intensive condenser

Intensive condenser (single spiral with cooling jacket)

| Jacket length<br>(mm) | Cone / Socket<br>(NS / DN) | Cat. No.  |
|-----------------------|----------------------------|-----------|
| 250                   | NS29/32                    | 2 783 229 |
| 400                   | NS29/32                    | 2 783 429 |
| 250                   | DN 25                      | 2 784 225 |
| 400                   | DN 25                      | 2 784 425 |

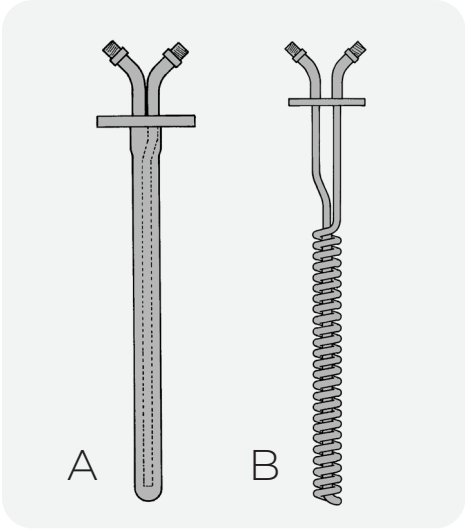


## Intensive condenser

Intensive condenser (double spiral with cooling jacket)

| For DN | Thread   | Cat. No.  |
|--------|----------|-----------|
| 400    | NS 45/40 | 2 785 445 |
| 500    | NS 45/40 | 2 785 545 |
| 400    | DN 50    | 2 786 450 |
| 500    | DN 50    | 2 786 550 |

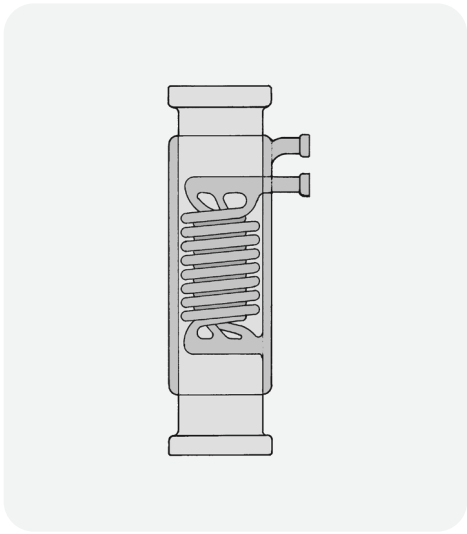
# HWS Heat exchanger



## Heat exchanger

HWS-Heat exchanger in stainless steel

| Jacket length<br>(mm) | Cone / Socket<br>(NS / DN) | Cat. No.<br>(A / B) |
|-----------------------|----------------------------|---------------------|
| 360                   | NS29/32                    | 2 788 229           |
| 460                   | NS29/32                    | 2 788 429           |
| 400                   | DN 25                      | 2 788 430           |
| 500                   | DN 25                      | 2 788 530           |

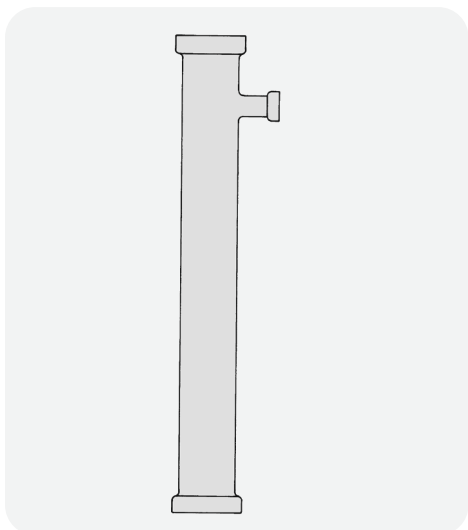


## Intensive condenser

Intensive condenser (double spiral with cooling jacket)

| For DN | Thread | Cat. No.  |
|--------|--------|-----------|
| 500    | DN 80  | 2 787 580 |
| 500    | DN 100 | 2 787 591 |
| 600    | DN 80  | 2 787 680 |
| 600    | DN 100 | 2 787 691 |
| 800    | DN 80  | 2 787 880 |
| 800    | DN 100 | 2 787 891 |

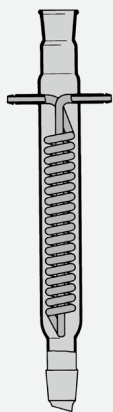
# HWS Heat exchanger



## Glass jacket

Glass jacket for heat exchanger in stainless steel

| Jacket length<br>(mm) | Joint<br>(NS / DN) | ventilation nozzle<br>(NS / DN) | Cat. No.<br>(A / B) |
|-----------------------|--------------------|---------------------------------|---------------------|
| 360                   | NS29/32            | NS29/32                         | 2 788 925           |
| 460                   | NS29/32            | NS29/32                         | 2 788 940           |
| 400                   | DN 25              | DN 15                           | 2 788 955           |
| 500                   | DN 25              | DN 15                           | 2 788 970           |

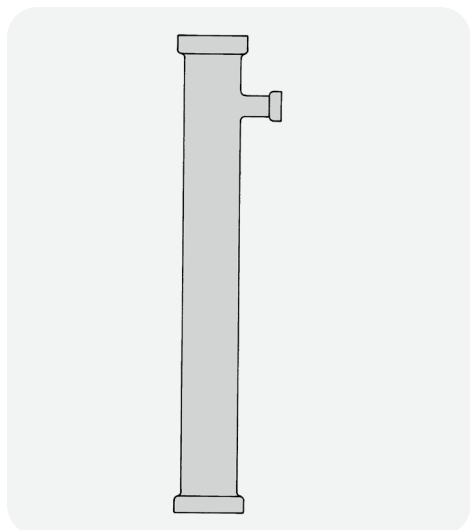


## Dimroth condenser

HWS-Dimroth condenser, according to DIN 12 591  
Other jacket lengths available.

| Jacket length<br>(mm) | Cone/Socket<br>(NS) | Total length<br>(mm) | Cat. No.  |
|-----------------------|---------------------|----------------------|-----------|
| 160                   | 14,5/23             | 250                  | 2 781 214 |
| 160                   | 19/26               | 250                  | 2 781 219 |
| 160                   | 29/32               | 250                  | 2 781 229 |
| 250                   | 14,5/23             | 340                  | 2 781 314 |
| 250                   | 19/26               | 340                  | 2 781 319 |
| 250                   | 29/32               | 340                  | 2 781 329 |
| 250                   | 45/40               | 340                  | 2 781 345 |
| 400                   | 29/32               | 490                  | 2 781 429 |
| 400                   | 45/40               | 490                  | 2 781 445 |
| 500                   | 29/32               | 620                  | 2 781 529 |
| 500                   | 45/40               | 620                  | 2 781 545 |

# HWS Funnel for constant dosing

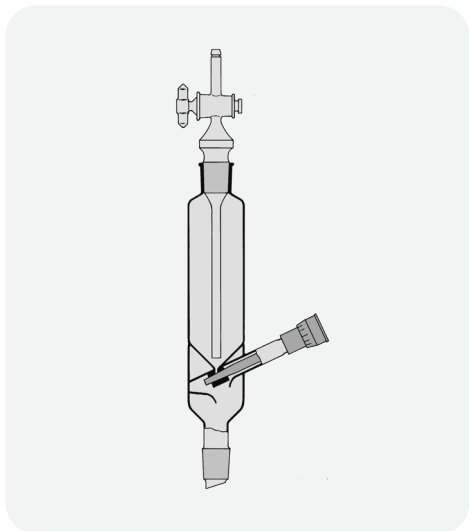


## Glass jacket

Glass jacket for heat exchanger in stainless steel

| Jacket length<br>(mm) | Joint<br>(NS / DN) | ventilation nozzle<br>(NS / DN) | Cat. No.<br>(A / B) |
|-----------------------|--------------------|---------------------------------|---------------------|
| 360                   | NS29/32            | NS29/32                         | 2 788 925           |
| 460                   | NS29/32            | NS29/32                         | 2 788 940           |
| 400                   | DN 25              | DN 15                           | 2 788 955           |
| 500                   | DN 25              | DN 15                           | 2 788 970           |



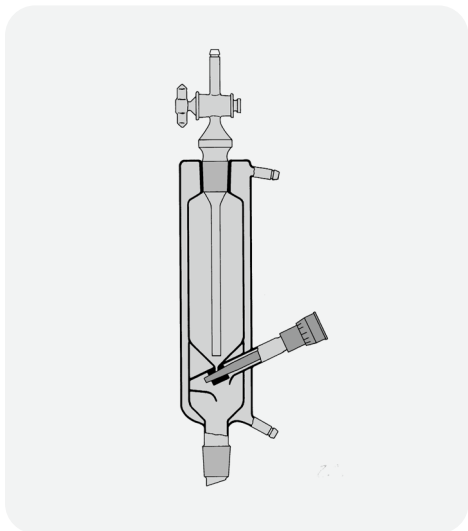


## Funnel for constant dosing

HWS-Funnel for constant dosing without jacket, manual contro

| Capacity<br>(ml) | Ext. Diam.<br>(Ø mm) | Cone/Socket<br>(NS) | Cat. No.<br>(PTFE-valve) | Cat. No.<br>(Glass-valve) |
|------------------|----------------------|---------------------|--------------------------|---------------------------|
| 50               | 34                   | 29/32               | 2 620 529                | 2 630 529                 |
| 100              | 38                   | 29/32               | 2 621 029                | 2 631 029                 |
| 250              | 48                   | 29/32               | 2 622 529                | 2 632 529                 |
| 500              | 58                   | 29/32               | 2 625 029                | 2 635 029                 |
| 1000             | 80                   | 29/32               | 2 629 129                | 2 639 129                 |
| 2000             | 100                  | 29/32               | 2 629 229                | 2 639 229                 |
| 5000             | 150                  | 45/40               | 2 629 529                | 2 639 529                 |

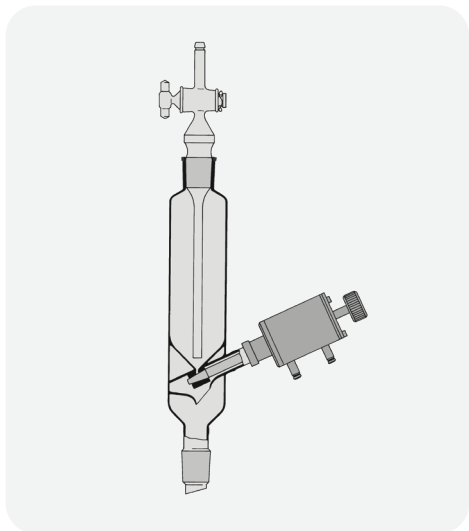
# HWS Funnel for constant dosing



## Funnel with jacket

HWS-Funnel for constant dosing with jacket, manual control.

| Capacity<br>(ml) | Ext. Diam.<br>(Ø mm) | Cone/Socket<br>(NS) | Cat. No.<br>(PTFE-valve) | Cat. No.<br>(Glass-valve) |
|------------------|----------------------|---------------------|--------------------------|---------------------------|
| 50               | 34                   | 29/32               | 2 640 529                | 2 650 529                 |
| 100              | 38                   | 29/32               | 2 641 029                | 2 651 029                 |
| 250              | 48                   | 29/32               | 2 642 529                | 2 652 529                 |
| 500              | 58                   | 29/32               | 2 645 029                | 2 655 029                 |
| 1000             | 80                   | 29/32               | 2 649 129                | 2 659 129                 |
| 2000             | 100                  | 29/32               | 2 649 229                | 2 659 229                 |
| 5000             | 150                  | 45/40               | 2 649 529                | 2 659 529                 |

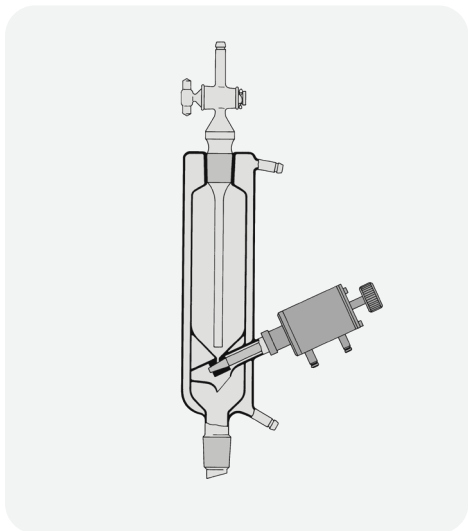


## Funnel for constant dosing

HWS-Funnel for constant dosing without jacket, pneumatically operated.

| Capacity<br>(ml) | Ext. Diam.<br>(Ø mm) | Cone/Socket<br>(NS) | Cat. No.<br>(PTFE-valve) | Cat. No.<br>(Glass-valve) |
|------------------|----------------------|---------------------|--------------------------|---------------------------|
| 50               | 34                   | 29/32               | 2 660 529                | 2 670 529                 |
| 100              | 38                   | 29/32               | 2 661 029                | 2 671 029                 |
| 250              | 48                   | 29/32               | 2 662 529                | 2 672 529                 |
| 500              | 58                   | 29/32               | 2 665 029                | 2 675 029                 |
| 1000             | 80                   | 29/32               | 2 669 129                | 2 679 129                 |
| 2000             | 100                  | 29/32               | 2 669 229                | 2 679 229                 |
| 5000             | 150                  | 45/40               | 2 669 529                | 2 679 529                 |

# HWS Funnel for constant dosing



## Funnel with jacket

HWS-Funnel for constant dosing with jacket, pneumatically operated.

| Capacity<br>(ml) | Ext. Diam.<br>(Ø mm) | Cone/Socket<br>(NS) | Cat. No.<br>(PTFE-valve) | Cat. No.<br>(Glass-valve) |
|------------------|----------------------|---------------------|--------------------------|---------------------------|
| 50               | 34                   | 29/32               | 2 680 529                | 2 690 529                 |
| 100              | 38                   | 29/32               | 2 681 029                | 2 691 029                 |
| 250              | 48                   | 29/32               | 2 682 529                | 2 692 529                 |
| 500              | 58                   | 29/32               | 2 685 029                | 2 695 029                 |
| 1000             | 80                   | 29/32               | 2 689 129                | 2 699 129                 |
| 2000             | 100                  | 29/32               | 2 689 229                | 2 699 229                 |
| 5000             | 150                  | 45/40               | 2 689 529                | 2 699 529                 |



## “Dosini” for dosing of solids

Simple and effective, solids can be added continuously.

- speed 0-250 rpm
- switch off in case of overload
- suited for unobserved use
- power 18 Watt
- the temperature range up to 200°C

| Capacity<br>(ml) | Joint<br>(NS / DN) | Cat. No      |
|------------------|--------------------|--------------|
| 50               | 29/32              | 22500005/29A |
| 100              | 29/32              | 2500010/29A  |
| 250              | 29/32              | 2500025/29A  |
| 500              | 29/32              | 2500050/29A  |
| 1.000            | 29/32              | 2500100/29A  |
| 2.000            | 29/32              | 2500200/29A  |
| 5.000            | 29/32              | 2500100/29A  |

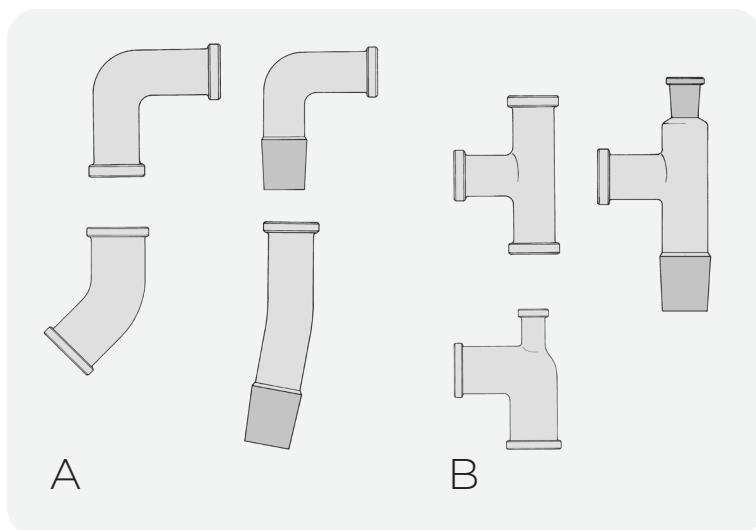


## Controller

Additional identification letters for: Standard, Plus, Super, Super FDA, Super LN.

| Controller<br>(VD) | Speed control<br>(%) | Interface<br>(mA / V) | Cat. No   |
|--------------------|----------------------|-----------------------|-----------|
| VD 01              | 10 - 100 %           | —                     | 6 780 010 |
| VD 02              | 0 - 100 %            | 4 - 20 mA / 0 - 10 V  | 6 780 100 |

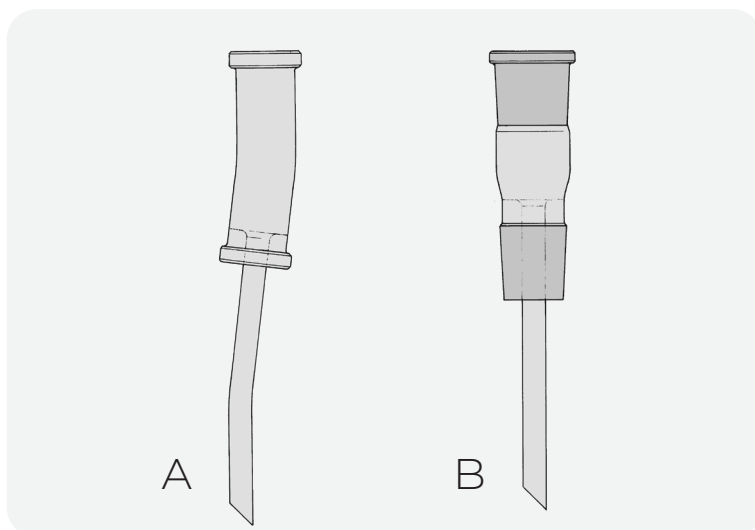
# HWS Accessory parts



## Bend for connection

- A: without thermometer port (angle 170° or 100°)
- B: with thermometer port (angle 100°)

| For<br>(NS / DN) | ventilation nozzle<br>(NS / DN) | Cat. No.<br>(A) | Cat. No.<br>(B) |
|------------------|---------------------------------|-----------------|-----------------|
| NS 14            | 170                             | 2 704 114       | 2 705 114       |
| NS 14            | 100                             | 2 704 214       | 2 705 214       |
| NS 19            | 170                             | 2 704 119       | 2 704 119       |
| NS 19            | 100                             | 2 704 219       | 2 705 219       |
| NS 29            | 170                             | 2 704 129       | 2 705 129       |
| NS 29            | 100                             | 2 704 229       | 2 705 229       |
| DN 15            | 170                             | 2 704 515       | 2 705 515       |
| DN 15            | 100                             | 2 704 615       | 2 705 615       |
| DN 25            | 170                             | 2 704 525       | 2 705 525       |
| DN 25            | 100                             | 2 704 625       | 2 705 625       |



## Inlet tube

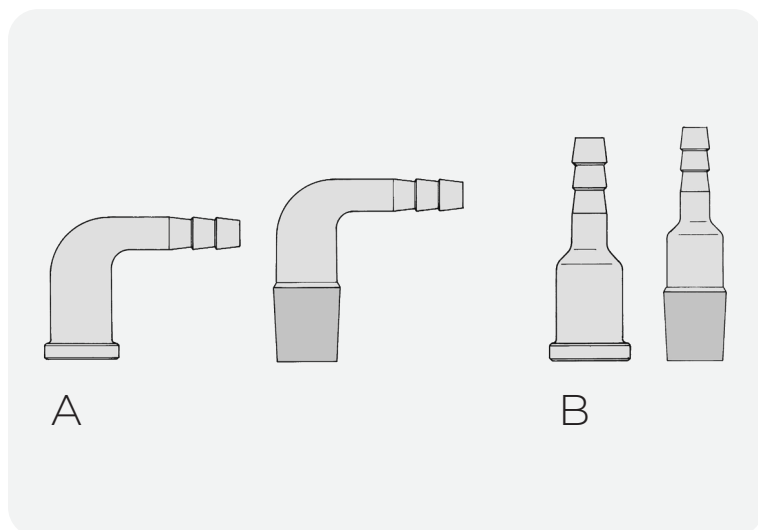
- A: for angled side neck (approx. 10°)
- B: for straight side neck

| For<br>(NS / DN) | ventilation nozzle<br>(NS / DN) | Cat. No.<br>(A) | Cat. No.<br>(B) |
|------------------|---------------------------------|-----------------|-----------------|
| NS 14            | 170                             | 2 704 114       | 2 705 114       |
| NS 14            | 100                             | 2 704 214       | 2 705 214       |
| NS 19            | 170                             | 2 704 119       | 2 704 119       |
| NS 19            | 100                             | 2 704 219       | 2 705 219       |
| NS 29            | 170                             | 2 704 129       | 2 705 129       |
| NS 29            | 100                             | 2 704 229       | 2 705 229       |
| DN 15            | 170                             | 2 704 515       | 2 705 515       |
| DN 15            | 100                             | 2 704 615       | 2 705 615       |
| DN 25            | 170                             | 2 704 525       | 2 705 525       |
| DN 25            | 100                             | 2 704 625       | 2 705 625       |

# HWS Accessory parts

## Adapter with olive (thread)

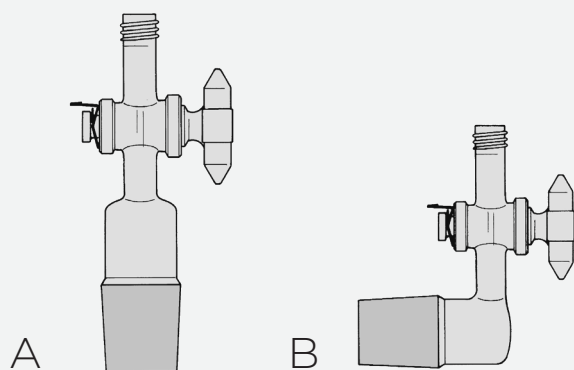
with screw thread available, too



- A: straight
- B: angled

| Joint<br>(NS / DN) | Oliv | Cat. No.<br>(A) | Cat. No.<br>(B) |
|--------------------|------|-----------------|-----------------|
| NS 14              | A 11 | 2 770 0014/A11  | 2 770 0014/A11  |
| NS 19              | A 11 | 2 770 0019/A11  | 2 770 0019/A11  |
| NS 19              | A 13 | 2 770 0019/A13  | 2 770 0019/A13  |
| NS 29              | A 13 | 2 770 0029/A13  | 2 770 0029/A13  |
| NS 29              | A 16 | 2 770 0029/A16  | 2 770 0029/A16  |
| DN 15              | A 13 | 2 770 0415/A13  | 2 770 0415/A13  |
| DN 15              | A 16 | 2 770 0415/A16  | 2 770 0415/A16  |
| DN 25              | A 16 | 2 770 0425/A16  | 2 770 0425/A16  |
| DN 25              | A 19 | 2 770 0425/A19  | 2 770 0425/A19  |





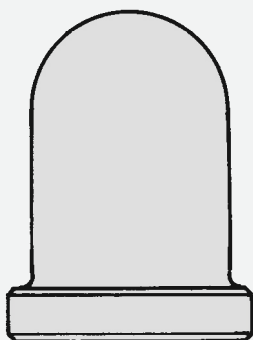
## Adapter with stopcock and screw thread GL 14\*\*

\*\* with screw thread GL 18 and GL 25 available, too.

- A: straight
- B: angled

| Joint<br>(NS / DN) | Oliv | Cat. No.<br>(A) | Cat. No.<br>(B) |
|--------------------|------|-----------------|-----------------|
| NS 14              | A 11 | 2 770 0014/A11  | 2 770 0014/A11  |
| NS 19              | A 11 | 2 770 0019/A11  | 2 770 0019/A11  |
| NS 19              | A 13 | 2 770 0019/A13  | 2 770 0019/A13  |
| NS 29              | A 13 | 2 770 0029/A13  | 2 770 0029/A13  |
| NS 29              | A 16 | 2 770 0029/A16  | 2 770 0029/A16  |
| DN 15              | A 13 | 2 770 0415/A13  | 2 770 0415/A13  |
| DN 15              | A 16 | 2 770 0415/A16  | 2 770 0415/A16  |
| DN 25              | A 16 | 2 770 0425/A16  | 2 770 0425/A16  |
| DN 25              | A 19 | 2 770 0425/A19  | 2 770 0425/A19  |

# HWS Accessory parts



## Automatic controller LR 03

Universal two-step action controller for the control of e.g. temperature, pressure, level or output. Circuit of power by relay.

### Joint - Closing stoppers (NS)

#### Cat. No.

|       |           |
|-------|-----------|
| NS 14 | 2 100 014 |
| NS 19 | 2 100 019 |
| NS 29 | 2 100 029 |
| NS 45 | 2 100 045 |

### Joint - Closing stoppers (DN)

#### Cat. No.

|       |           |
|-------|-----------|
| DN 10 | 3 100 310 |
| DN 15 | 2 100 315 |
| DN 25 | 3 100 325 |
| DN 40 | 2 100 340 |
| DN 50 | 2 100 350 |
| DN 80 | 2 100 380 |

# HWS Automatic controller



## Automatic controller LR 03

- Connected load: **220 V/50 Hz**
- Dimensions: **90 x 110 x 105 mm**
- Weight: **ca. 0,6 kg**
- Contact loading: **0,35 mA**
- Power output: **2000 Watt**
- Potential contact: **4 V**

### Cat. No.

Table version with cable

6 120 003

Equipment with support rod

6 121 003



## Automatic controller LR 20

- Connected load: **220 V/50 Hz**
- Dimensions: **210 x 130 x 150 mm**
- Weight: **ca. 0,8 kg**
- Regulation: **Two-step controller**
- Power output: **2000 Watt**
- Range: **0 - 100 %**

### Cat. No.

Table version with cable

6 130 020

Equipment with support rod

6 131 020

# HWS Temperature controller



## Temperature controller LR 10 / LR 15

HWS-Temperature controller LR 10 / 15

- Connected load: **230 V/50-60 Hz**
- Dimensions: **160 x 82 x 130 mm**
- Weight: **ca. 1.5 kg**
- Resolution: **0,1°C / 0.01**
- Power output: **2000 Watt**
- Range: **0 - 100 %**
- Accuracy: **0.1 / 0.4 % \*\***

Cat. No.

LR 10, Economy Version without security switch-off

6 310 010

LR 15, Economy Version with security switch-off

6 130 015



## Temperature controller LR 30

HWS-Temperature controller LR 10 / 15

- Connected load: **230 V/50-60 Hz**
- Dimensions: **160 x 82 x 130 mm**
- Weight: **ca. 1.5 kg**
- Resolution: **0,1°C / 0.01**
- Power output: **2000 Watt**
- Range: **0 - 100 %**
- Accuracy: **0.1 / 0.4 % \*\***

Cat. No.

LR 30 Plus version with working and security control system  
and security switch-off ( 1 x double PT100 or 2 x single PT 100)

6 130 030

# HWS Reflux Controller

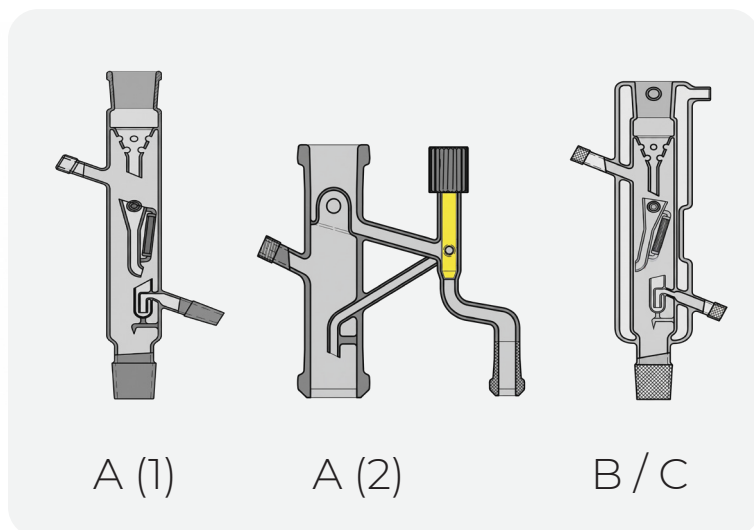


## HWS-Reflux Controller RS 04

- Connected load: **230 V/50 Hz**
- Dimensions: **210 x 130 x 150 mm**
- Weight: **ca. 3,8 kg**
- Contact loading: **5 mA**
- Elimination of interference: **N acc. to VDE 0875**
- Output for magnet: **24 V /1,5 A**
- Rated power: **27 Watt**
- timing pulse rate: **1 s**

|                            | Cat. No.  |
|----------------------------|-----------|
| Table version with cable   | 6 400 000 |
| Magnet                     | 6 130 015 |
| Cable for magnet 6 400 003 | 6 400 003 |
| Magnet holder for Ø 60 mm  | 6 401 060 |
| PT 100: Ebl 80 mm, Ø 6 mm  | 6 810 306 |

# HWS column head



A (1): swivel funnel  
A (2): Manually controlled  
B / C: Swivel funnel

## Column heads (liquid divider)

for the division of condensate into reflux and outlet.

- Execution A: **Standard without jacket**
- Execution B: **with vacuum jacket**
- Execution C: **with vacuum jacket, with viewing stripes.** Ref No. same as B with addition of V (like 4 801 010V)
- Execution D: **R with jacket for thermostatisation** (with GL 18 or DN 15) Ref No. same as B with addition of T (like 4 801 010T)

Manually controlled, with GL connection for PT100 sensors, with PTFE valve 0-10 mm

| 1<br>(DN/NS) | 2<br>(DN/NS) | 2<br>(DN/NS) | PT 100<br>(GL) | Cat. No.<br>(A) | Cat. No.<br>(B) |
|--------------|--------------|--------------|----------------|-----------------|-----------------|
| NS 29/32     | NS 29/32     | NS 29/32     | GL 18          | 4 802 029       | 4 804 029       |
| NS 45/40     | NS 45/40     | NS 29/32     | GL 18          | 4 802 045       | 4 804 045       |
| DN 25 *      | DN 25 *      | DN 15        | GL 18          | 4 803 025       | 4 805 025       |
| DN 40 *      | DN 40 *      | DN 15        | GL 18          | 4 803 040       | 4 805 040       |
| DN 50 *      | DN 50 *      | DN 15        | GL 18          | 3 803 050       | 4 805 050       |
| DN 80 *      | DN 80 *      | DN 15        | GL 18          | 4 803 080       | 4 805 080       |
| DN 100 *     | DN 100 *     | DN 25        | GL 18          | 4 803 100       | 4 805 100       |
| DN 150 *     | DN 150 *     | DN 25        | GL 18          | 4 803 150       | 4 805 150       |

**With electromagnetically operated swivel funnel  
with GL port for PT100 sensor, with internal siphon in the distillate outlet**

| <b>1<br/>(DN/NS)</b> | <b>2<br/>(DN/NS)</b> | <b>2<br/>(DN/NS)</b> | <b>PT 100<br/>(GL)</b> | <b>Cat. No.<br/>(A)</b> | <b>Cat. No.<br/>(B)</b> |
|----------------------|----------------------|----------------------|------------------------|-------------------------|-------------------------|
| NS 29/32             | NS 29/32             | NS 29/32             | GL 18                  | 4 806 029               | 4 808 029               |
| NS 45/40             | NS 45/40             | NS 29/32             | GL 18                  | 4 806 045               | 4 808 045               |
| DN 25 *              | DN 25 *              | DN 15                | GL 18                  | 4 807 025               | 4 809 025               |
| DN 40 *              | DN 40 *              | DN 15                | GL 18                  | 4 807 040               | 4 809 040               |
| DN 50 *              | DN 50 *              | DN 15                | GL 18                  | 4 807 050               | 4 809 050               |
| DN 80 *              | DN 80 *              | DN 15                | GL 18                  | 4 807 080               | 4 809 080               |
| DN 100 *             | DN 100 *             | DN 25                | GL 18                  | 4 807 100               | 4 809 100               |
| DN 150 *             | DN 150 *             | DN 25                | GL 18                  | 4 807 150               | 4 809 150               |

# Temperature probe



## Temperature probe PT 100

HWS-Temperature probe PT 100 (acc. DIN 43 760) for the exact proportional regulation of temperature.

- A: Single PT 100
- B: Double PT 100
- C: According to your wishes

| Material        | Length<br>(mm) | Cat. No.<br>(A) | Cat. No.<br>(B) |
|-----------------|----------------|-----------------|-----------------|
| Glass           | 200 x 8        | 6 832 101       | 6 942 101       |
| Glass           | 300 x 8        | 6 833 101       | 6 943 101       |
| Stainless steel | 200 x 6        | 6 832 001       | 6 942 001       |
| stainless steel | 300 x 6        | 6 833 001       | 6 943 001       |





## Singles / Doubles - PT 100

Additional to these types we produce according to your wishes further executions. Please add code numbers.

|               |  | Cat. No.  |
|---------------|--|-----------|
| Single PT 100 |  | 6 8xy yzz |
| Double PT 100 |  | 6 9xy yzz |

### x: Material of cover

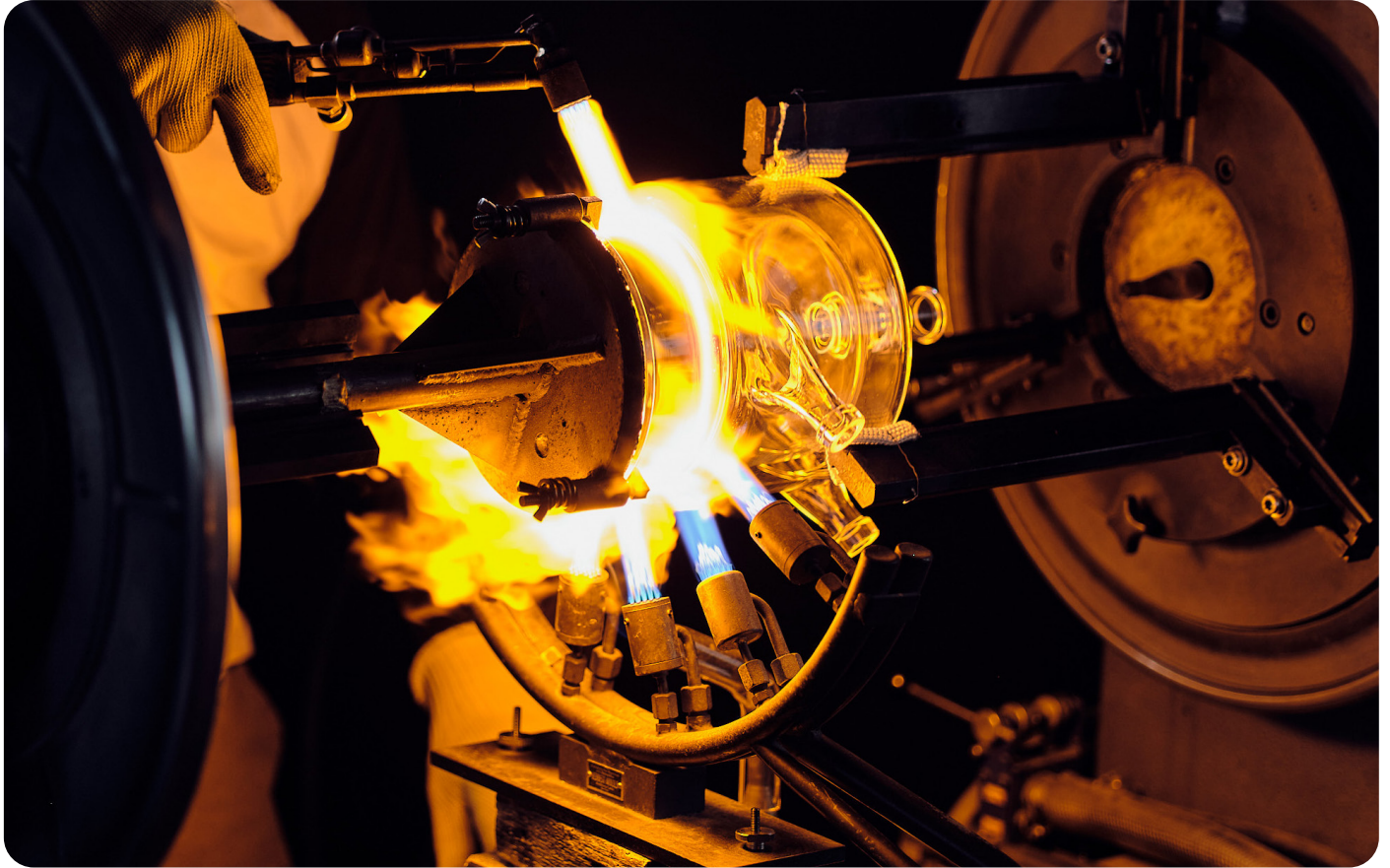
- 0: glass
- 1: s/s, (1.4571)
- 2: s/s PFA coated
- 3: others
- 4: s/s glass-coated

### yy: Length

Length in cm. For length over 99 cm, indicate 00 and add correct length

### zz: Diameter

in mm



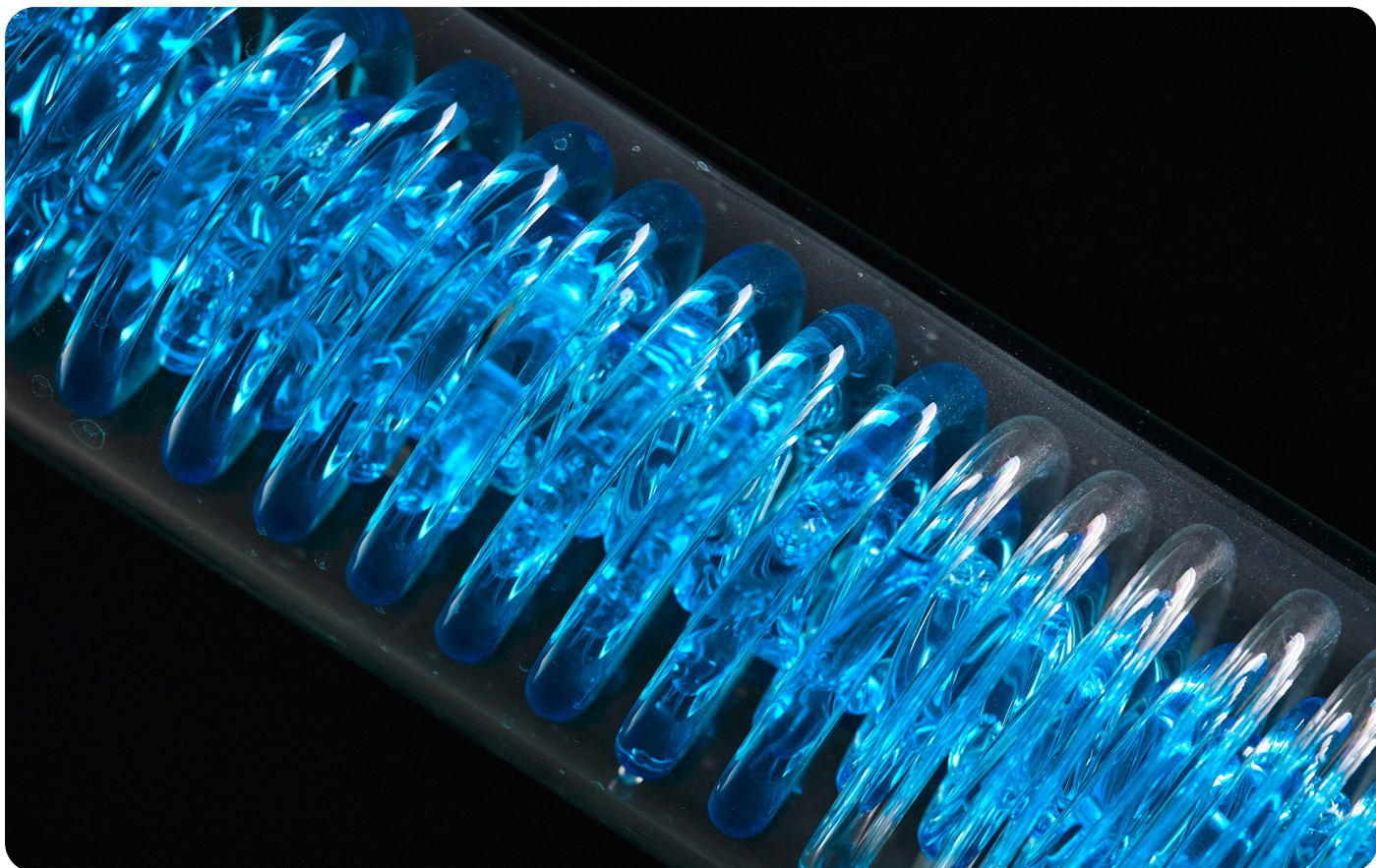
## Borosilicate Glass 3.3

Borosilicate glass 3.3 (DIN ISO 3585) represents the major international standards. Maximum thermal resistance, thermal shock resistance, mechanical resistance as well as unusual chemical resistance are required. Very long life, even under extreme operating conditions.

### Physical Properties

Linear coefficient of expansion (20-300°C):  $3.3 \times 10^{-6}/K$

- Maximum allowable service temperature (temporary): 500°C
- Transformation temperature: 530°C
- Lower annealing temperature: 510°C
- Upper annealing temperature: 560°C
- Softening temperature: 815°C
- Working temperature: 1265°C
- Density: 2.23 g/cm<sup>3</sup>



## Chemical Properties

Highly resistant to water, neutral and acid solutions, concentrated acids and their mixtures, as well as to chlorine, bromine and organic matters. Even during extended periods of reaction and at temperatures above 100°C, its chemical resistance exceeds that of most metals and other materials.

Classification:

- Hydrolytic class 1
- Acid class 1
- Alkaline solution class 2

Only hydrofluoric acid, very hot phosphoric acid and alkaline solutions increasingly attack the glass surface.

## Optical Properties

Spectral region of negligible absorption: approx. 310 to 2200 nm. Amber-tinted glass absorbs up to approx. 500 nm (for light-sensitive products).



# HWS Product Range Overview



## Flat flange reactor units and accessories

complete units, single components, laboratory equipment in glass



## Universal glass

components for laboratories



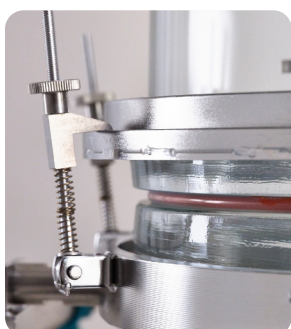
## Laboratory aids

in metal and plastic materials - general accessories



## Components for glass blowers

custom components



## Glass filtration

instruments



## Electronic equipment

laboratory regulators, temperature regulators, control instruments



## Analytical and testing equipment



## Biotechnology plants



## Contact thermometers

platinum resistance thermometers



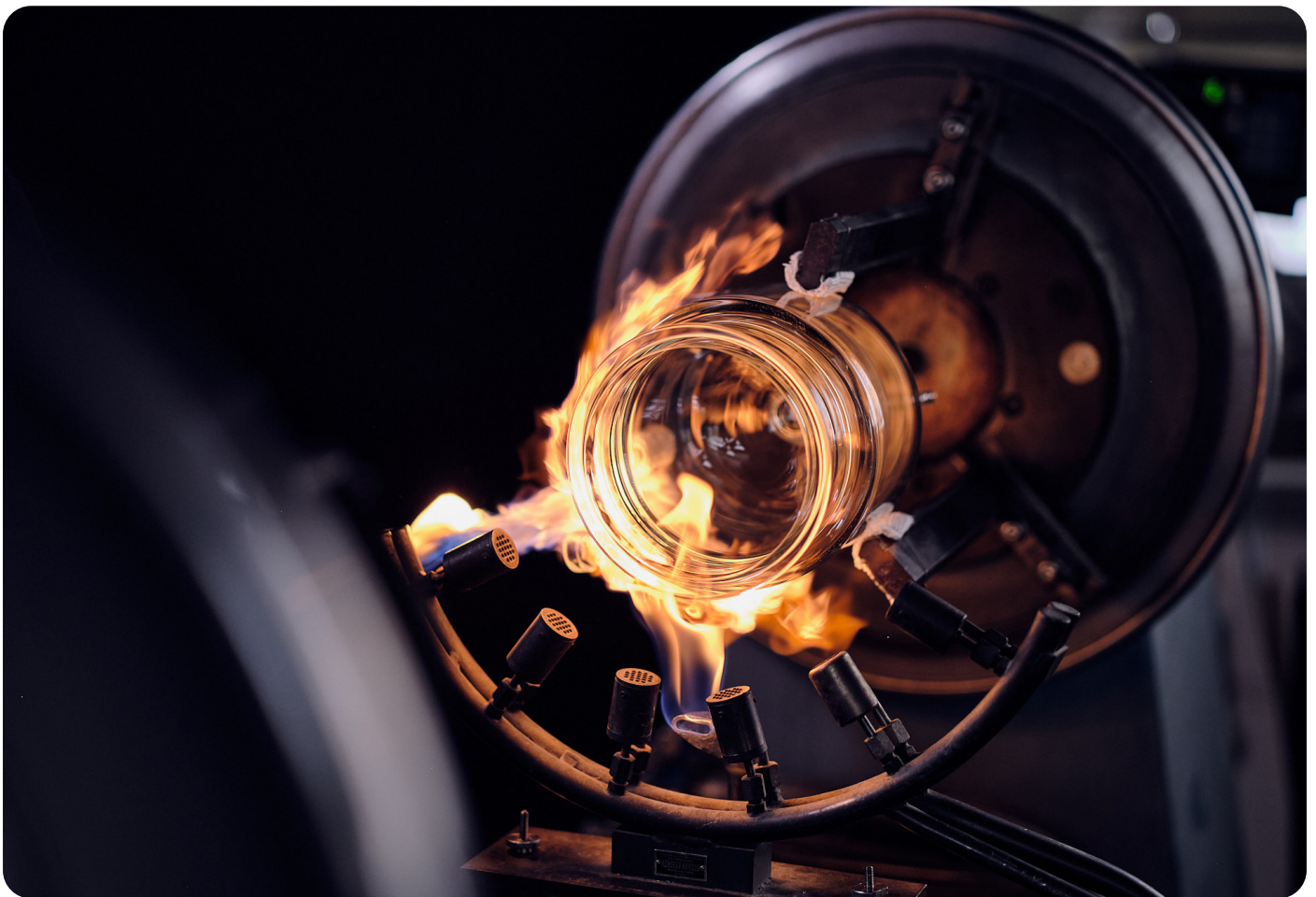
## Metal and plastic accessories

according to buyer's specification

# H ▶ W ▶ S

L A B O R T E C H N I K

Quality products for Industry  
and Research Changes are reserved.



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