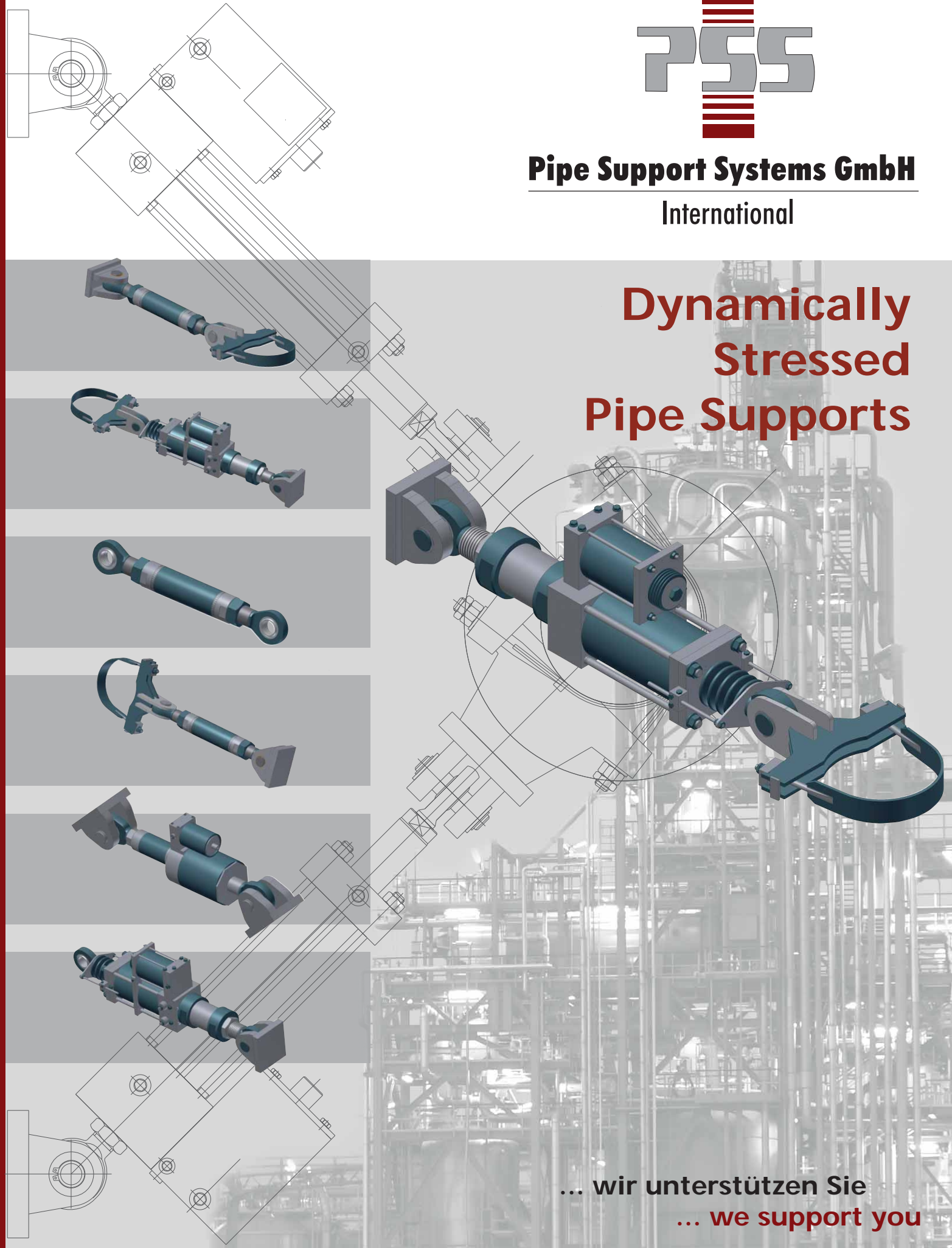
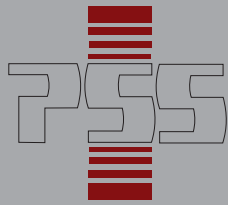


**Pipe Support Systems GmbH**  
International

# Dynamically Stressed Pipe Supports



... wir unterstützen Sie  
... we support you



**Pipe Support Systems GmbH**  
International



### ... we are

a leading manufacturing company specialising in the field of pipe support products and systems.

PSS has over 35 years experience in design, engineering and manufacturing of pipe hangers for power plants, chemical and petrochemical projects.

Our design, manufacturing, R&D and marketing departments are located in modern facilities in the city of Neunkirchen.

Our manufacturing operations are carried out with the newest production machinery and test equipment and our personnel employs the proven technology required to make us your reliable partner who will truly meet your needs.

PSS has a powerful and experienced team of engineers, technicians, service and sales personnel at our Neunkirchen facility as well as through our representatives and partner companies worldwide.





## ENGINEERING

- Design and Calculation of all Types of Pipe Supports
- Detail Engineering
- PDMS Engineering
- Design of Special Pipe Supports
- Stress Analysis and Finite Element Analysis

## ... OUR PRODUCT RANGE

- Hydraulic Shock and Sway Suppressors (snubbers)
- Constant Hangers and Supports
- Variable Spring Hangers and Supports
- Pipe Clamps
- Sway Struts
- Special Pipe Supports
- Accessories for Pipe Hangers

## ... OUR MAJOR MARKETS

- Nuclear and Conventional Power Plants
- Refineries
- Platforms
- Oil, Gas and Chemical Process Plants and Related Industries

## ... OUR QUALITY STANDARDS

DIN EN ISO 9001  
KTA 1401  
SIEMENS QSP 4A

## PSS STANDARD SUPPORTS

are designed in accordance with:

DIN EN, VGB and SVDB Specifications  
BS3974, Part 1  
KTA 3205.3  
ANSI B 31.1  
MSS SP 58 and MSS SP 69  
ASME Section III, Subsection NF

## PSS INTERNATIONAL PRODUCTS

are worldwide present in more than 60 countries in Europe, Asia, North- and South America, Africa and Oceania.

... wir unterstützen Sie  
... we support you



# Content Summary

|  |    |
|--|----|
| <b>Dynamically Stressed Pipe Supports</b>  | 5  |
| <b>1. Hydraulic Shock Suppressors and Vibration Dampers</b>  | 6  |
| General Information on Hydraulic Shock Suppressors and Vibration Dampers (Snubbers)<br>Application, Function   | 6  |
| Construction and quality characteristics   | 7  |
| Design Variations  | 8  |
| Standard settings and test values,<br>Maintenance of hydraulic shock suppressors and vibration dampers         | 9  |
| Test Diagram for Hydraulic Snubbers  | 10 |
| <b>Technical data</b>  |    |
| Allowable loads  | 11 |
| Figures without extension: Figures 200A, 200B, 202A  |    |
| Figures with extension: Figures 201A, 201B, 203A   | 12 |
| Figures 200A, 201A   | 13 |
| Figures 200B, 201B   | 14 |
| Figures 202A, 203A   | 15 |
| Calculation cold position, hot position  | 16 |
| <b>2. Extensions</b>   | 17 |
| Extension pieces for Hydraulic Shock and Sway Suppressors  | 17 |
| <b>Technical data</b>  |    |
| Extension pieces, Fig. 201S, 201C and 201W   | 18 |
| <b>3. Sway struts</b>  | 19 |
| General Information on Sway struts<br>Application, Construction and quality characteristics, Design Variations | 19 |
| <b>Technical data</b>  |    |
| Figure 211L Typ E1   | 20 |
| Figure 211L Typ E2   | 21 |
| <b>4. Weld-on brackets</b>   | 22 |
| General Information on Weld-on brackets  | 22 |
| <b>Technical data</b>  |    |
| Figure EHS 14S   | 23 |
| <b>5. Dynamic load clamps</b>  | 24 |
| General Information on Dynamic load clamps   | 24 |
| <b>Technical data</b>  |    |
| Dynamic three bolt clamp, Fig. 211R  | 25 |
| Dynamic yoke clamp, EHS17D   | 28 |
| Dynamic U-Bolt clamp, EHS18S   | 32 |
| Dynamic Vertical clamp, Fig. 403D  | 34 |

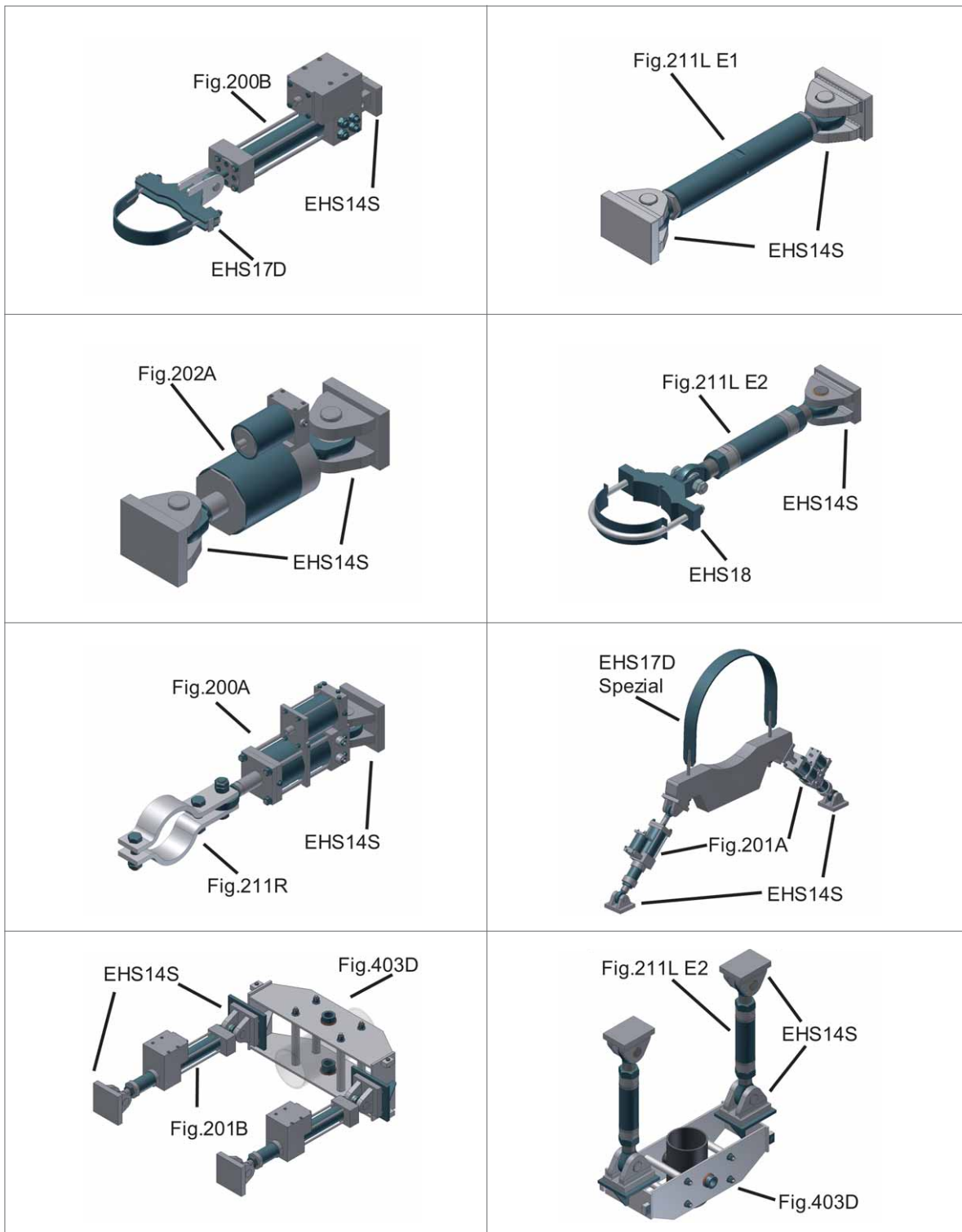
# Dynamically Stressed Pipe Supports



Dynamically stressed pipe supports from PSS are used to support, restrain and suppress dynamic load events.

This group consists of the following products:

- Hydraulic shock suppressors and vibration dampers
- Sway struts
- Weld-on brackets
- Dynamic pipe clamps



# Hydraulic Shock Suppressors and Vibration Dampers

## 1. Hydraulic Shock Suppressors and Vibration Dampers

### 1.1 Application

Hydraulic shock suppressors and vibration dampers are components of great relevance to the technical safety of pipelines and system components, and are employed for the purpose of their protection.

PSS hydraulic shock suppressors and vibration dampers are employed to prevent damage to apparatuses, pipelines, pressure vessels, valves and pumps, which can occur through suddenly acting forces. This includes dynamic load events which can occur during operation, such as water hammer, pipe bursts or pressure surges caused by blowing off safety valves, as well as cases resulting from external events and conditions, such as earthquakes, explosions and wind load. Moreover, PSS hydraulic shock suppressors and vibration dampers can be employed in vibrating pipelines and system components where vibration damping is required.

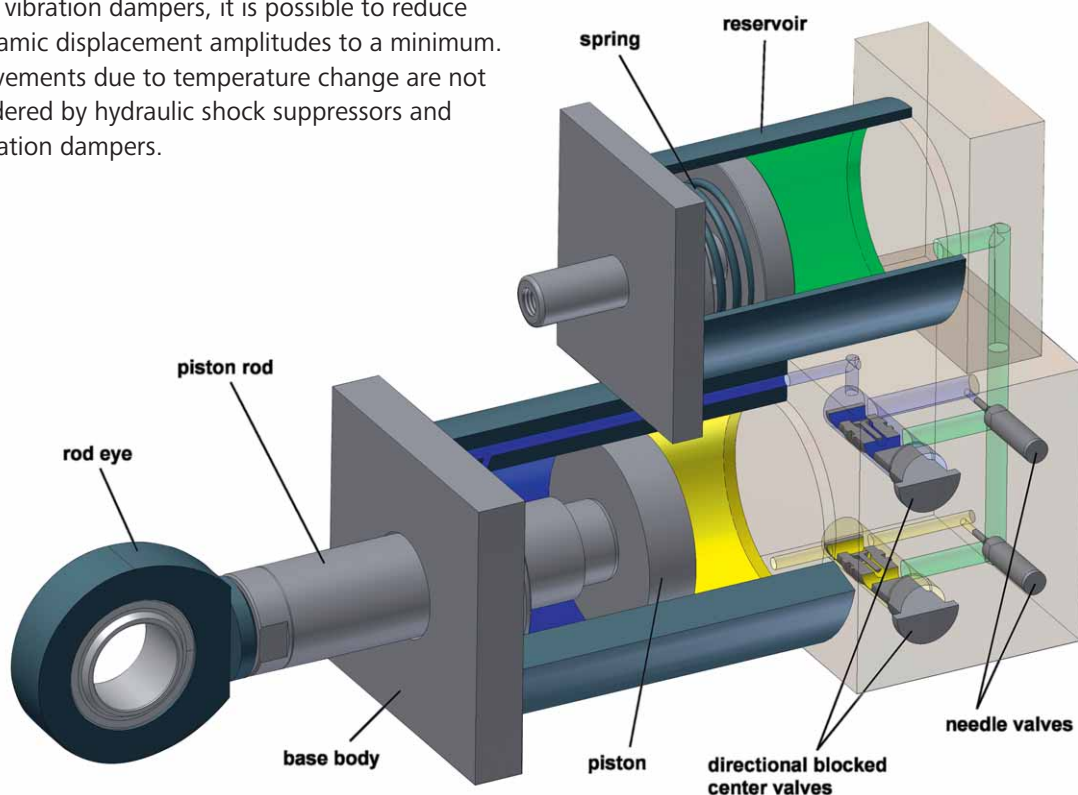
Conditions:

- Amplitude is greater than 0.5 mm
- Frequency is in the range 1-33Hz

By employing hydraulic shock suppressors and vibration dampers, it is possible to reduce dynamic displacement amplitudes to a minimum. Movements due to temperature change are not hindered by hydraulic shock suppressors and vibration dampers.

### 1.2 Function

In the event of a dynamic load that causes the piston to move faster than the locking velocity set by PSS (standard velocity 2 mm/s), the check valve closes, the free flow of the silicon oil is impeded, and the shock suppressor absorbs forces. When the pre-set force level is not attained, for instance when the direction of movement is reversed, the check valve opens up again. In the event of a vibrating movement, both check valves open and close alternately, i.e. the shock suppressor absorbs the same load in both tension and compression directions. The bypass (or overflow) valve allows the piston to yield as far as the defined nominal load.



# Hydraulic Shock Suppressors and Vibration Dampers



## 1.3 Construction and quality characteristics

The PSS hydraulic shock suppressors and vibration dampers have pressurized hydraulic systems thus allowing their installation in any position and orientation. The fluid level of the suppressors can be easily and accurately verified through the position of the piston rods as they relate to each other.

PSS hydraulic shock suppressors and vibration dampers are of a modular construction. Modifications and alterations, which may be required due to tight installation spaces or in order to replace shock suppressors from other manufacturers, can be implemented quickly by modifying the standard components.

at high frequencies in tension and compression directions. When the direction of movement changes, the second valve can already react before the first valve has returned to its initial position.

By employing modern, high-quality sealing and guide components, a service life of 40 years can be expected from a PSS shock suppressors when used in nuclear applications. Relevant simulation testing with shock suppressors, Fig. 200A, have been conducted in association with the TÜV institute. Depending on the conditions in which hydraulic shock suppressors and vibration dampers are employed, a maintenance-free period of between ten and 25 years can be assured.

**Use conditions for PSS hydraulic shock absorbers and vibration dampers**

|                                | Unit      | With hydraulic fluid nuclear | With hydraulic fluid standard |
|--------------------------------|-----------|------------------------------|-------------------------------|
| Constant operating temperature | [°C]      | -20 to 80                    | -50 to 80                     |
| Short-term temperature*        | [°C]      | 150                          | 150                           |
| Radiation dose, max.           | [Megarad] | 100                          | 20                            |
| Ambient pressure, constant op. | [bar]     | 1                            | 1                             |
| Ambient pressure, short-term   | [bar]     | 10                           | 10                            |
| Solidification point           | [°C]      | -40                          | -67                           |
| Flashpoint                     | [°C]      | >550                         | 600                           |
| Ignition point                 | [°C]      | >600                         | >675                          |

\* max. 40h per year with max. cycle times of 1 hour

A PSS hydraulic shock suppressor and vibration damper consists of two valve pairs, working independently and which are externally accessible. This allows the dampers to be optimised in accordance with customer requirements on the test bench (e.g. locking velocity, bleed rate). Even following installation, it is still possible to modify the settings should this be required by the conditions at the installation site. By employing independently functioning closing valves, PSS hydraulic shock suppressors and vibration dampers are able to generate the force required for use

The following documents were taken into consideration in the dimensioning of PSS hydraulic shock suppressors and vibration dampers:

VGB Guidelines (Richtlinien)  
KTA 3205.3  
DIN 1050, DIN 4100  
BS 3974, Part 1  
ANSI B31.1  
MSS SP 58  
MSS SP 69  
SVDB Guidelines (Richtlinien)  
ASME Section III Subsection NF

# Hydraulic Shock Suppressors and Vibration Dampers

## 1.4 Design Variations

PSS hydraulic shock suppressors and vibration dampers are manufactured and available in the following options:

### Standard design

Housing components made of carbon steel with an extremely corrosion-resistant zinc-iron coating, 15 µm.

The piston rods are additionally coated with 40 µm electroless nickel on all sides and the shaft with 20 µm hard chrome.

### Low-temperature design down to -50°C

Housing components are made of stainless steel 1.4301 and additionally coated with 15 µm electroplated nickel.

Piston rods made of materials suitable for use at low temperatures are additionally coated with 40 µm electroless nickel on all sides and the shaft with 20 µm hard chrome.

### Stainless steel design

All housing components, piston rods and joint heads are made of chloride-resistant steels, e.g. 1.4462 or 1.4404, with coating if required.

### Offshore design

Piston rods and reservoir made of chloride resistant stainless steels, e.g. 1.4462 or 1.4404, rod eyes supplied in material 1.4541.

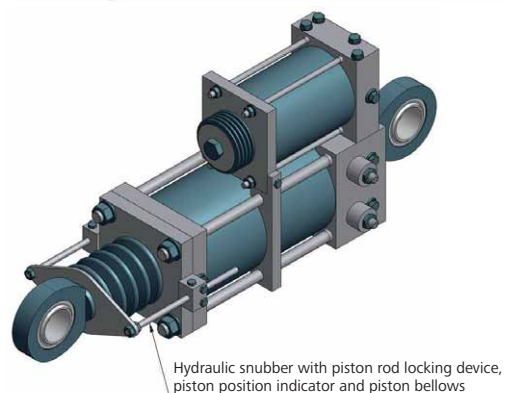
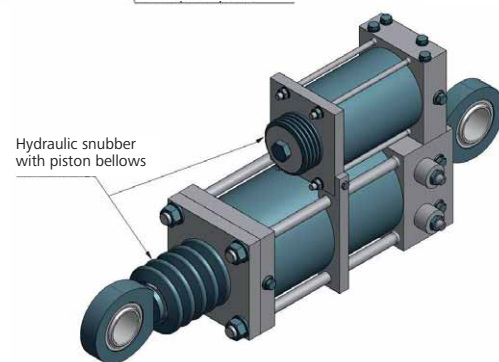
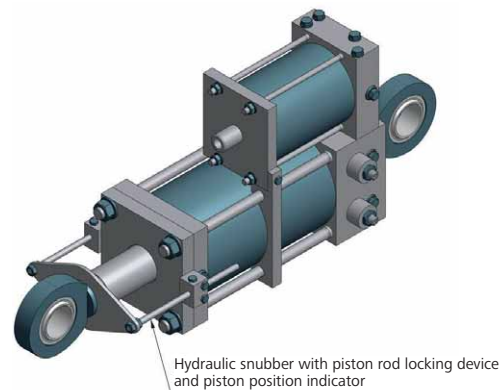
Stainless steel hydraulic snubber



The cylinder body is made of carbon steels, protected by a zinc-iron plating plus a painting system according corrosive category C5-M (PSS-painting system PSS-6)

Other material combinations and special coatings are available if requested by the customer.

Furthermore, PSS offers special accessories, such as bellows for protection against the build up of hard ice deposits on the piston rods or to protect the piston rods when employed in sandstorms or in installation areas with a high level of dirt. To prevent the installation length supplied by the customer from being altered during installation, PSS also offers a piston rod lock as an optional accessory. This can be combined with the piston position indicator (see images).





# Hydraulic Shock Suppressors and Vibration Dampers



## 1.5 Standard settings and test values per KTA 3205.3 and VGB-R510L:

|  |  |
|--|--|
| Rolling resistance:                    | max. 2% of nominal load  |
| Friction:                              | max. 2% of nominal load  |
| Response speed:                        | 2 – 6 mm/s   |
| Post-reaction speed:                   | 0,2 – 2,0 mm/s   |
| Sliding rod distance Sa:               | > 0,5 mm (non-rotating)  |
| Sliding rod distance Sb:               | < amount $\pm$ 0.02 nominal displacement (force build-up peak-to-peak)         |
| Temperatures:                          | max. operating temp. 80°C<br>Short-term operating temp. for max. 3 hours 150°C |
| Deflection perpendicular to bolt axis: | max.: $\pm$ 70°  |
| Deflection in bolt axis:               | min.: $\pm$ 5°   |

special settings on customer demands

## 1.6 Maintenance of hydraulic shock suppressors and vibration dampers

PSS hydraulic shock suppressors and vibration dampers are composed of metallic and organic components. The metallic components are dimensioned in line with the various application designs to provide a service life that conforms with the maximum service life of a system (up to 40 years). The hydraulic fluid and seals are made of organic components, which are subject to natural ageing. When used in extreme conditions, it is possible that these components age at an accelerated rate (constant vibration, high temperature, extreme radiation). Depending on the location and purpose of the hydraulic shock suppressors and vibration dampers, the seals and hydraulic fluid should be changed after 20 years at the latest.

The operator of the system is responsible for maintaining the system components. However, PSS provides the following maintenance recommendations that apply to hydraulic shock suppressors and vibration dampers:

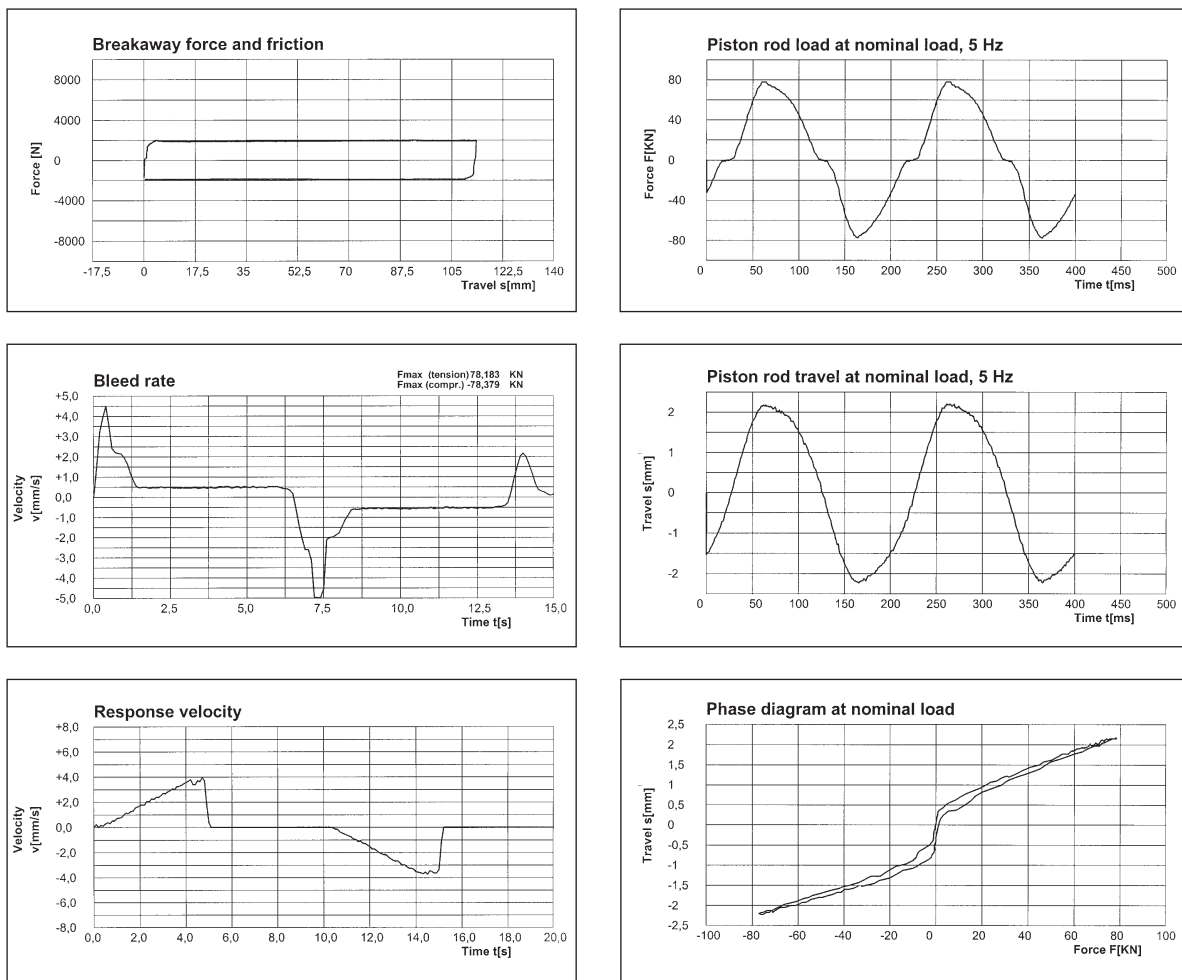
- Annual visual inspection of the shock suppressors and checking of the position of the reservoir piston rod (as long as this is visible, there is sufficient hydraulic fluid in the shock suppressor).
- After a period of 10-15 years, a functional test of the individual shock suppressors is recommended, to be performed on a hydraulic test bench.
- After 20 years at the latest, both the hydraulic fluid and the seals should be changed.

PSS will be happy to supply you with a service plan compiled specifically for the system and the application of the hydraulic shock suppressors and vibration dampers.

# Hydraulic Shock Suppressors and Vibration Dampers

## Test Diagram for Hydraulic Snubbers

|   |   |                                    |                                   |
|---|---|------------------------------------|-----------------------------------|
| Figure No.:<br><b>200A</b>              | Size (inch):<br><b>6</b>                | Nominal travel (inch):<br><b>5</b> | Serial Number:<br><b>R8925N10</b> |
| Nominal load (Newton):<br><b>303000</b> | PSS works order number:<br><b>10209</b> | Customer:                          | Temperature (°C):<br><b>21</b>    |
|   |   |                                    | Mark No.:<br><b>1075</b>          |



## Test Results

| Breakaway force (Newton) |             | Friction force (Newton) |             | Bleed rate (mm/s) |             |
|--------------------------|-------------|-------------------------|-------------|-------------------|-------------|
| tension                  | compression | tension                 | compression | tension           | compression |
| 2005                     | –           | 1927                    | – 1886      | 0,5               | – 0,5       |

| Response velocity (mm/s) |             | Load at 5 Hz (Newton) |             | Piston reaction travel (mm) |     |
|--------------------------|-------------|-----------------------|-------------|-----------------------------|-----|
| tension                  | compression | tension               | compression | Sa                          | Sb  |
| 3,9                      | – 3,9       | 78272                 | – 77139     | 0,5                         | 4,4 |

| Measured stroke | Measured reservoir oil level | Leakage control | Miscellaneous |
|-----------------|------------------------------|-----------------|---------------|
| 127,7 mm        | 63,0 mm                      | ok              |               |

# Hydraulic Shock Suppressors and Vibration Dampers



## 1.7 Technical Data

### Allowable loads:

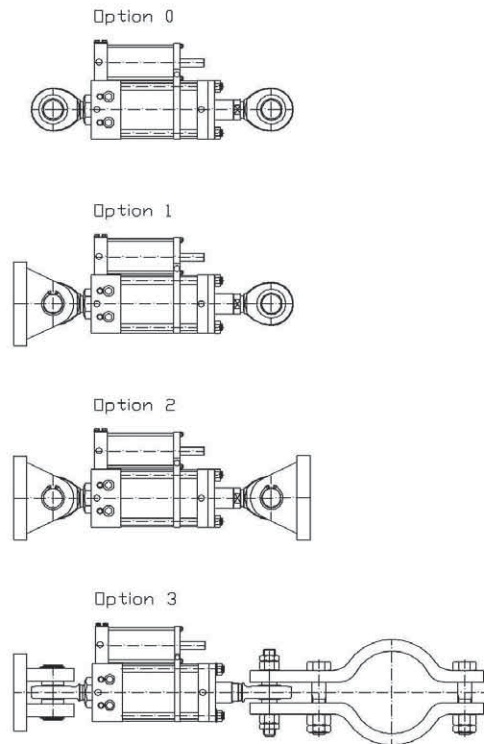
| cylinder-bore size | Figure     | Figure with extension | $1 \times F_N$     | $1,5 \times F_N$   | $1,7 \times F_N$   |
|--------------------|------------|-----------------------|--------------------|--------------------|--------------------|
| inch               |            |                       | load case H* [kN]  | load case HZ* (kN) | load case HS* [kN] |
|                    |            |                       | A/B** Nominal load | C** Emergency      | D** Faultet        |
| 1/4, 1/2, 1        | 200A, 200B | 201A, 201B            | 8                  | 12                 | 14                 |
| 1 1/2              | 200A, 200B | 201A, 201B            | 13                 | 20                 | 22                 |
| 2 1/2              | 200A, 200B | 201A, 201B            | 45                 | 68                 | 77                 |
| 3 1/4              | 200A, 200B | 201A, 201B            | 78                 | 117                | 133                |
| 4                  | 200A       | 201A                  | 121                | 182                | 206                |
| 5                  | 200A       | 201A                  | 202                | 303                | 343                |
| 6                  | 200A       | 201A                  | 303                | 455                | 515                |
| 8 1/2              | 202A       | 203A                  | 590                | 885                | 1003               |
| 10                 | 202A       | 203A                  | 835                | 1253               | 1419               |
| 12                 | 202A       | 203A                  | 1200               | 1800               | 2040               |
| 14                 | 202A       | 203A                  | 1730               | 2595               | 2941               |
| 17                 | 202A       | 203A                  | 2470               | 3705               | 4199               |
| 20 1/2             | 202A       | 203A                  | 3610               | 5415               | 6137               |
| 24 1/2             | 202A       | 203A                  | 5130               | 7695               | 8721               |
| 29 1/2             | 202A       | 203A                  | 7510               | 11265              | 12767              |
| 35 1/2             | 202A       | 203A                  | 10815              | 16223              | 18385              |
| 43                 | 202A       | 203A                  | 16155              | 24233              | 27463              |

\* KTA Nuclear Safety Commission 3205.3

\*\* ASME Section III, Sub-section NF

# Hydraulic Shock Suppressors and Vibration Dampers

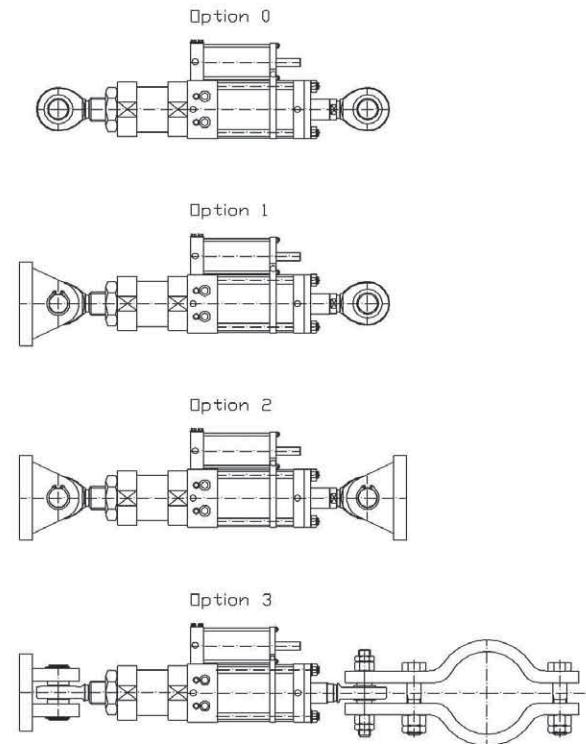
## Figures without extension Figures 200A, 200B, 202A



### Fig. 200A, 200B, 202A

- Option 0: snubber body with 2 rod eyes
- Option 1: snubber body with 2 rod eyes  
1 rear bracket EHS 14S at the steelwork
- Option 2: snubber body with 2 rod eyes  
2 rear brackets EHS 14S
- Option 3: snubber body with 2 rod eyes  
1 rear bracket EHS 14S at the steelwork  
1 special dynamic pipe clamp

## Figures with extension Figures 201A, 201B, 203A



### Fig. 201A, 201B, 203A (with extension)

- Option 0: snubber body with 2 rod eyes  
1 extension piece (201S, C, W)
- Option 1: snubber body with 2 rod eyes  
1 rear bracket EHS 14S at the steelwork  
1 extension piece (201S, C, W)
- Option 2: snubber body with 2 rod eyes  
2 rear bracket EHS 14S  
1 extension piece (201S, C, W)
- Option 3: snubber body with 2 rod eyes  
1 rear bracket EHS 14S at the steelwork  
1 extension piece (201S, C, W)  
1 special dynamic pipe clamp

# Hydraulic Shock Suppressors and Vibration Dampers



Fig. 200A

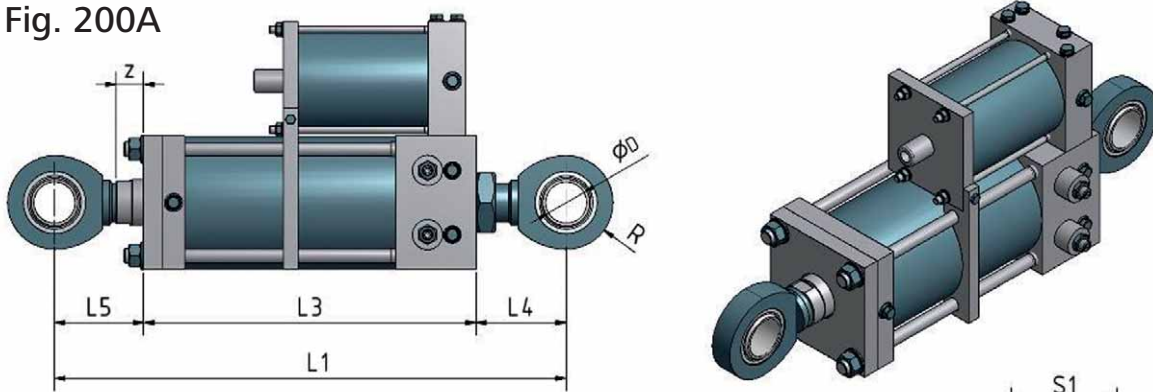
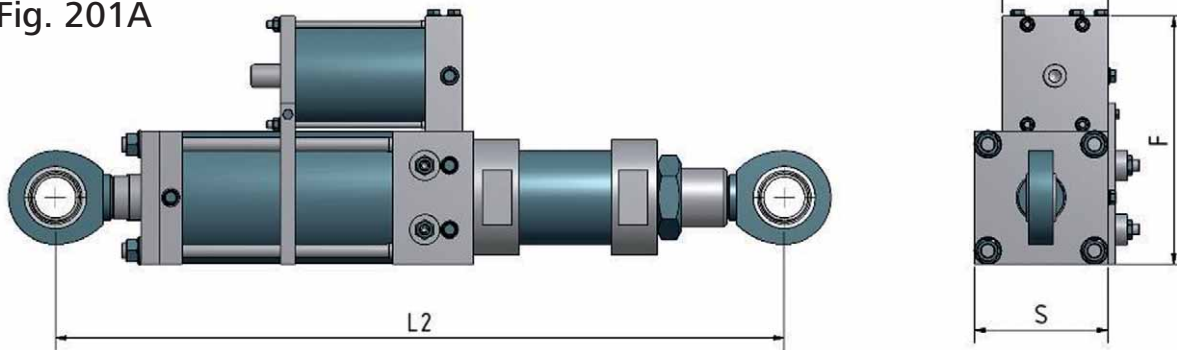


Fig. 201A



| Fig. 200A / 201A |              |        | L1   | L1   | L2   | L2   | L3   | ØD  | L4 | L5  | R   | F  | S   | S1  | EHS<br>14 S | z | Weight |       |    |
|------------------|--------------|--------|------|------|------|------|------|-----|----|-----|-----|----|-----|-----|-------------|---|--------|-------|----|
| Size             | Nominal load | Stroke | min. | max. | min. | max. |      |     |    |     |     |    |     |     |             |   |        |       |    |
|                  | kN           | inch   | mm   | mm   |      |      |      |     |    |     |     |    |     |     |             |   |        | Size  | mm |
| 1 1/2" *         | 13           | 5"     | 127  | 425  | 552  | 445  |      | 317 |    |     |     |    | 155 |     | 55          | B | 10     | 14,2  |    |
|                  |              | 10"    | 254  | 552  | 806  | 572  | 1500 | 444 | 15 | 42  | 66  | 22 | 155 | 90  | 55          |   |        | 15,7  |    |
|                  |              | 15"    | 381  | 679  | 1060 | 699  |      | 571 |    |     |     |    | 165 |     | 65          |   |        | 18,4  |    |
| 2 1/2" *         | 45           | 5"     | 127  | 440  | 567  | 475  |      | 330 |    |     |     |    | 175 |     | 65          | D | 17     | 27,1  |    |
|                  |              | 10"    | 254  | 567  | 821  | 602  | 2000 | 457 | 25 | 52  | 58  | 34 | 195 | 100 | 90          |   |        | 36,0  |    |
|                  |              | 15"    | 381  | 694  | 1075 | 729  |      | 584 |    |     |     |    | 195 |     | 90          |   |        | 41,4  |    |
|                  |              | 20"    | 508  | 821  | 1329 | 856  |      | 711 |    |     |     |    | 195 |     | 90          |   |        | 46,9  |    |
| 3 1/4" *         | 78           | 5"     | 127  | 487  | 614  | 529  |      | 355 |    |     |     |    | 245 |     | 105         | E | 25     | 45,0  |    |
|                  |              | 10"    | 254  | 614  | 868  | 656  | 2500 | 482 | 30 | 62  | 70  | 37 | 245 | 130 | 105         |   |        | 58,0  |    |
|                  |              | 15"    | 381  | 741  | 1122 | 783  |      | 609 |    |     |     |    | 245 |     | 105         |   |        | 65,8  |    |
|                  |              | 20"    | 508  | 868  | 1376 | 910  |      | 736 |    |     |     |    | 245 |     | 105         |   |        | 73,7  |    |
| 4"               | 121          | 5"     | 127  | 545  | 672  | 603  |      | 362 |    |     |     |    | 260 |     | 105         | F | 25     | 59,0  |    |
|                  |              | 10"    | 254  | 672  | 926  | 730  | 3000 | 489 | 45 | 90  | 93  | 51 | 260 | 145 | 105         |   |        | 73,0  |    |
|                  |              | 15"    | 381  | 799  | 1180 | 857  |      | 616 |    |     |     |    | 260 |     | 105         |   |        | 83,2  |    |
|                  |              | 20"    | 508  | 926  | 1434 | 984  |      | 743 |    |     |     |    | 260 |     | 105         |   |        | 93,4  |    |
| 5"               | 202          | 5"     | 127  | 625  | 752  | 695  |      | 381 |    |     |     |    | 295 |     | 105         | G | 30     | 77,0  |    |
|                  |              | 10"    | 254  | 752  | 1006 | 822  | 3000 | 508 | 60 | 119 | 125 | 68 | 295 | 180 | 105         |   |        | 93,0  |    |
|                  |              | 15"    | 381  | 879  | 1260 | 949  |      | 635 |    |     |     |    | 325 |     | 134         |   |        | 106,3 |    |
|                  |              | 20"    | 508  | 1006 | 1514 | 1076 |      | 762 |    |     |     |    | 325 |     | 134         |   |        | 119,6 |    |
| 6"               | 303          | 5"     | 127  | 697  | 824  | 779  |      | 420 |    |     |     |    | 355 |     | 134         | H | 30     | 106,0 |    |
|                  |              | 10"    | 254  | 824  | 1078 | 906  | 3000 | 547 | 70 | 137 | 140 | 80 | 355 | 210 | 134         |   |        | 126,0 |    |
|                  |              | 15"    | 381  | 951  | 1332 | 1033 |      | 674 |    |     |     |    | 355 |     | 134         |   |        | 145,2 |    |
|                  |              | 20"    | 508  | 1078 | 1586 | 1160 |      | 801 |    |     |     |    | 355 |     | 134         |   |        | 164,4 |    |

Special strokes on request

\* delivery on request, PSS standard is Figure 200B / 201B

# Hydraulic Shock Suppressors and Vibration Dampers

Fig. 200B

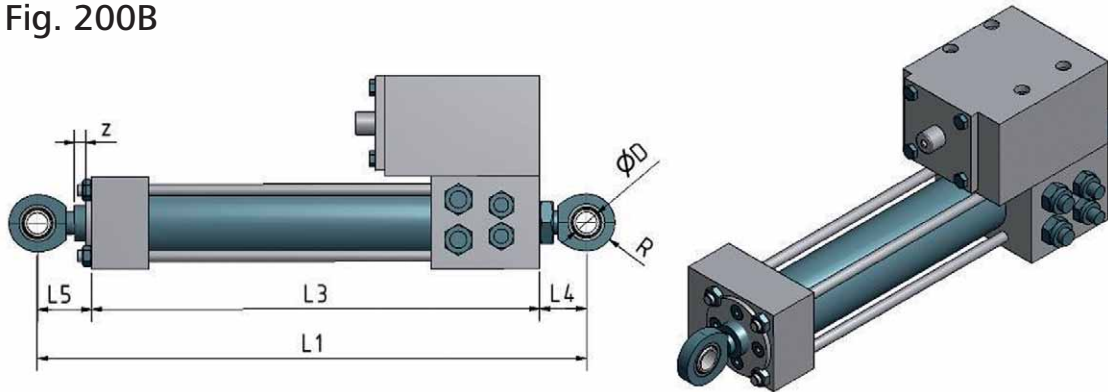
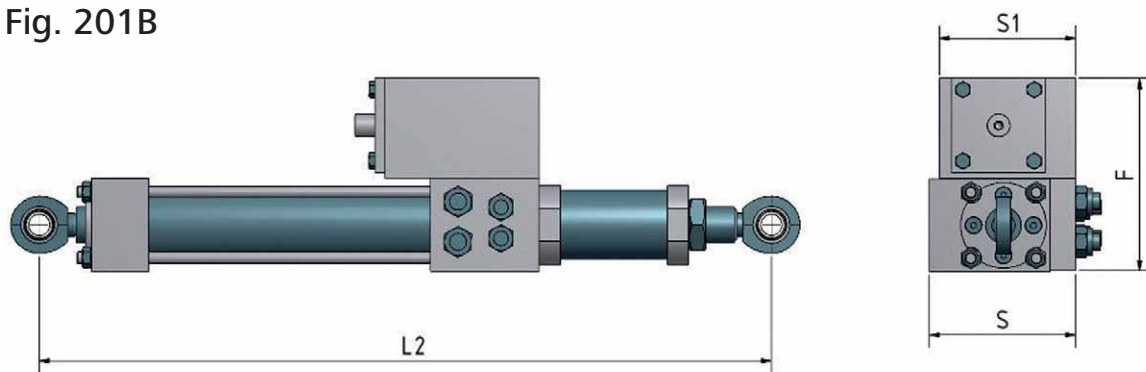


Fig. 201B



| Fig. 200B/201B |              |        | L1    | L1   | L2   | L2   | L3   | ØD  | L4  | L5 | R  | F  | S   | S1   | EHS<br>14 S | z  | Weight |      |
|----------------|--------------|--------|-------|------|------|------|------|-----|-----|----|----|----|-----|------|-------------|----|--------|------|
| Size           | Nominal load | Stroke | min.  | max. | min. | max. |      |     |     |    |    |    |     |      |             |    |        |      |
|                | kN           | inch   | mm    | mm   |      |      |      |     |     |    |    |    |     | Size | mm          | kg |        |      |
| 1/4"           | 3            | 5"     | 127,0 | 364  | 491  | 384  | 1000 | 287 | 10  | 28 | 49 | 15 | 120 | 87   | 81          | A  | 7      | 10,0 |
| 1/2"           | 5            | 5"     | 127,0 | 364  | 491  | 384  | 1000 | 287 | 10  | 28 | 49 | 15 | 120 | 87   | 81          | A  | 7      | 10,0 |
| 1"             | 8            | 5"     | 127,0 | 364  | 491  | 384  | 1000 | 287 | 10  | 28 | 49 | 15 | 120 | 87   | 81          | A  | 7      | 10,0 |
| 1 1/2"         | 13           | 5"     | 127,0 | 393  | 520  | 413  | 1500 | 310 | 15  | 45 | 38 | 22 | 135 | 103  | 96          | B  | 9      | 13,5 |
|                |              | 10"    | 254,0 | 520  | 774  | 540  |      | 437 |     |    |    |    |     |      |             |    |        | 15,0 |
|                |              | 15"    | 381,0 | 647  | 1028 | 667  |      | 564 |     |    |    |    |     |      |             |    |        | 19,2 |
| 2 1/2"         | 45           | 5"     | 127,0 | 442  | 569  | 477  | 2000 | 334 | 25  | 50 | 58 | 32 | 200 | 115  | 105         | D  | 17     | 26,5 |
|                |              | 10"    | 254,0 | 569  | 823  | 604  |      | 461 |     |    |    |    |     |      |             |    |        | 28,6 |
|                |              | 15"    | 381,0 | 696  | 1077 | 731  |      | 588 |     |    |    |    |     |      |             |    |        | 30,7 |
|                |              | 20"    | 508,0 | 823  | 1331 | 858  |      | 715 |     |    |    |    |     |      |             |    |        | 32,8 |
| 3 1/4"         | 78           | 5"     | 127,0 | 495  | 622  | 536  | 2500 | 355 | 35* | 68 | 72 | 41 | 240 | 135  | 130         | E  | 20     | 37,1 |
|                |              | 10"    | 254,0 | 622  | 876  | 663  |      | 482 |     |    |    |    |     |      |             |    |        | 41,6 |
|                |              | 15"    | 381,0 | 749  | 1130 | 790  |      | 609 |     |    |    |    |     |      |             |    |        | 47,7 |
|                |              | 20"    | 508,0 | 876  | 1384 | 917  |      | 736 |     |    |    |    |     |      |             |    |        | 52,3 |

Special strokes from 1" to 50" on request

\* validity 2011, ØD = 30 mm on request

# Hydraulic Shock Suppressors and Vibration Dampers



Fig. 202A

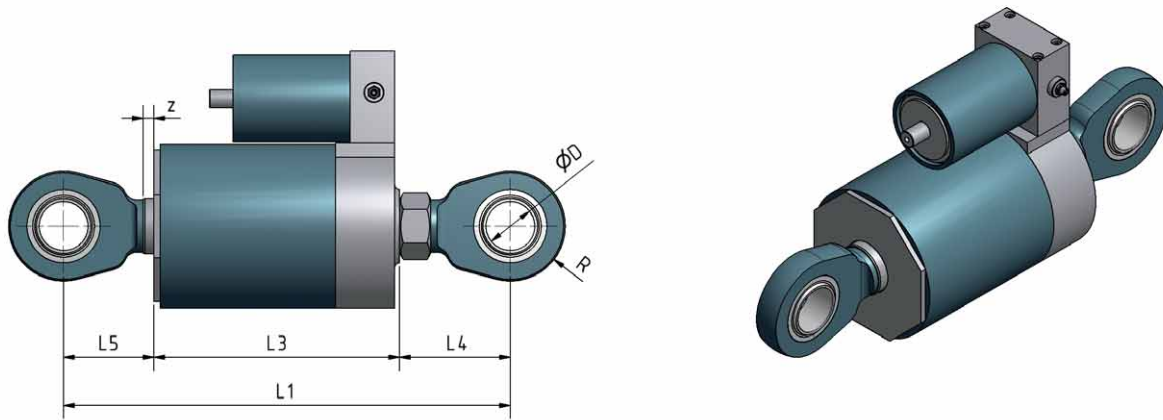
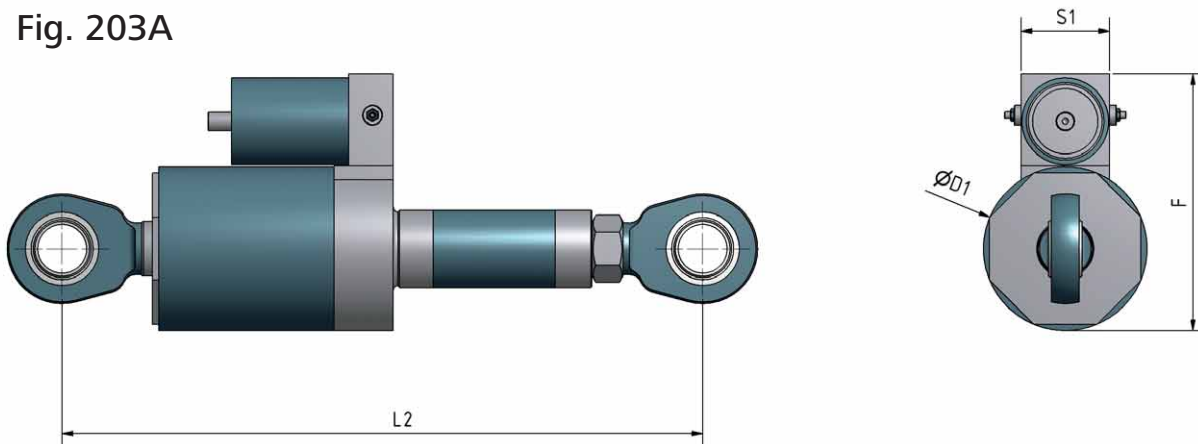


Fig. 203A



| Fig. 202A / 203A |                 | L1     | L1   | L2   | L2   | L3   | L4  | L5  | ØD  | S1  | R   | F   | ØD1  | EHS<br>14 S | z  | Weight |     |
|------------------|-----------------|--------|------|------|------|------|-----|-----|-----|-----|-----|-----|------|-------------|----|--------|-----|
| Size             | Nominal<br>load | Stroke | min. | max. | min. | max. | mm  |     |     |     |     |     | Size | mm          | kg |        |     |
|                  | kN              | mm     |      |      |      |      |     |     |     |     |     |     |      |             |    |        |     |
| 8,5"             | 590             | 127    | 689  | 816  | 770  | 3100 | 399 | 157 | 133 | 80  | 145 | 90  | 428  | 268         | I  | 3      | 161 |
|                  |                 | 254    | 816  | 1070 | 897  | 3100 | 526 |     |     |     |     |     |      |             |    |        | 192 |
| 10"              | 835             | 127    | 735  | 862  | 825  | 3400 | 443 | 157 | 135 | 90  | 170 | 100 | 488  | 310         | K  | 5      | 250 |
|                  |                 | 254    | 862  | 1116 | 952  | 3400 | 570 |     |     |     |     |     |      |             |    |        | 288 |
| 12"              | 1250            | 127    | 829  | 956  | 927  | 3800 | 487 | 182 | 160 | 110 | 170 | 123 | 538  | 360         | M  | 5      | 350 |
|                  |                 | 254    | 956  | 1210 | 1054 | 3800 | 614 |     |     |     |     |     |      |             |    |        | 408 |
| 14"              | 1730            | 127    | 908  | 1035 | 1024 | 4200 | 536 | 197 | 175 | 120 | 220 | 138 | 648  | 420         | N  | 5      | 515 |
|                  |                 | 254    | 1035 | 1289 | 1151 | 4200 | 663 |     |     |     |     |     |      |             |    |        | 587 |

Special bore diameters from 17" to 43" and special strokes on request

# Hydraulic Shock Suppressors and Vibration Dampers

## Calculation cold position, hot position

Cp = cold position  
 Hp = hot position  
 T/T = total travel

- Mvt = retraction  
 +Mvt = extension  
 z = dead length of the piston rod

### Single Movement:

$$Cp = \frac{T/T - (+/- Mvt)}{2} + z$$

$$Hp = Cp +/- Mvt$$

### Double Movement:

$$Cp = \frac{T/T - (+ Mvt) - (- Mvt)}{2} + z$$





# Extensions



## 2. Extensions

PSS extensions of the types 201S, 201C and 201W are used for bridging existing installation lengths without needing to introduce modifications to the existing steel construction.

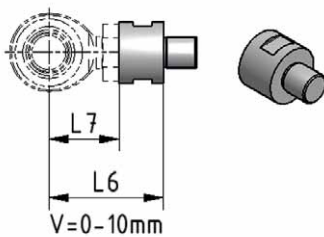
Specified installation dimensions can also be compensated when replacing snubbers by other makers. The extensions are attached to the snubber cylinder blocks by threaded parts. The PSS extension design also offers the ability to compensate existing construction tolerances by means of adjustment.

The amount of adjustment depends on the type and size; it is in the range of  $\pm 10$  mm for the type 201S,  $\pm 40$  mm for the type 201C and  $\pm 100$  mm for the type 201W.

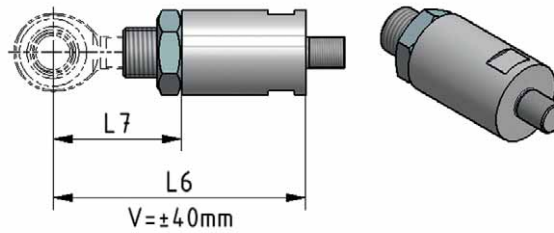
Standard extensions are manufactured from carbon steel and are zinc-iron plated. Depending on the type of PSS hydraulic snubber selected, extensions can be modified to the appropriate requirements and are manufactured to the customer's specification in all generally used steel types and coating systems.

### 2.1 Extension pieces for Hydraulic Shock and Sway Suppressors

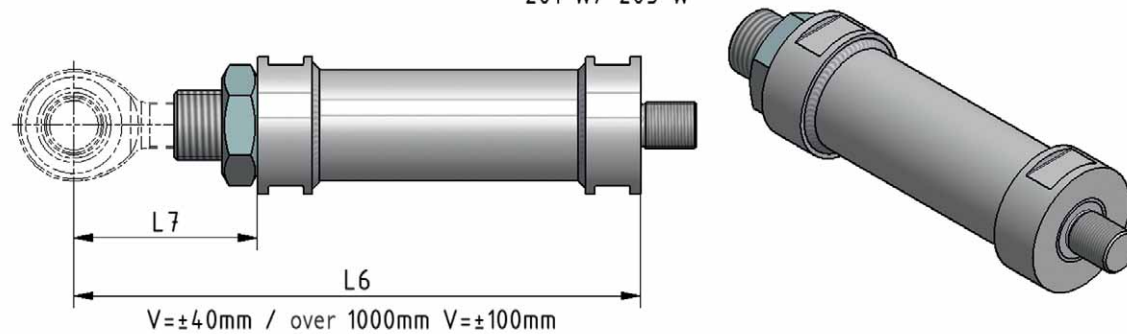
201 S/ 203 S



201 C/ 203 C



201 W/ 203 W



V = adjustability

# Extensions

Extension pieces, Fig. 201S, 201C and 201W

| type of extension | 1/4", 1/2", 1", 1 1/2" |             |         |                       |   | 2 1/2"      |             |         |                       |   | 3 1/4"      |             |         |                       |   |
|-------------------|------------------------|-------------|---------|-----------------------|---|-------------|-------------|---------|-----------------------|---|-------------|-------------|---------|-----------------------|---|
|                   | L6 min [mm]            | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm |
| stub 201 S        | 40/57 *                | 197         | 24/37 * | 0,1                   | 0,4   | 89          | 249         | 54      | 0,4                   | 1,2   | 109         | 269         | 66      | 0,8                   | 1,9   |
| compact 201 C     | 198                    | 429         | 83      | 1,8                   | 1,5   | 250         | 441         | 109     | 7,8                   | 5   | 270         | 458         | 122     | 7,7                   | 5   |
| welded 201 W      | 198/430 *              | 1120        | 73/83 * | 3,3                   | 0,5   | 442         | 1620        | 109     | 9,6                   | 1,2   | 459         | 2090        | 122     | 10,2                  | 1,2   |

| type of extension | 4"          |             |         |                       |   | 5"          |             |         |                       |   | 6"          |             |         |                       |   |
|-------------------|-------------|-------------|---------|-----------------------|---|-------------|-------------|---------|-----------------------|---|-------------|-------------|---------|-----------------------|---|
|                   | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm |
| stub 201 S        | 150         | 306         | 92      | 2,3                   | 3,9   | 168         | 358         | 122,5   | 4,7                   | 6,2   | 194         | 368         | 140     | 6,2                   | 7,5   |
| compact 201 C     | 307         | 469         | 145     | 13,3                  | 7,5   | 359         | 695         | 174     | 23,9                  | 12,1  | 369         | 710         | 189     | 23,2                  | 12,1  |
| welded 201 W      | 470         | 2550        | 145     | 20,4                  | 2,3   | 696         | 2500        | 174     | 39,7                  | 3,2   | 711         | 2450        | 189     | 40,7                  | 3,2   |

| type of extension | 8 1/2"      |             |         |                       |   | 10"         |             |         |                       |   | 12"         |             |         |                       |   | 14"         |             |         |                       |   |
|-------------------|-------------|-------------|---------|-----------------------|---|-------------|-------------|---------|-----------------------|---|-------------|-------------|---------|-----------------------|---|-------------|-------------|---------|-----------------------|---|
|                   | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm | L6 min [mm] | L6 max [mm] | L7 [mm] | Weight at L6 min [Kg] | increase in weight [kg] per additional 100 mm |
| stub 201 S        | 237         | 430         | 157     | 7,3                   | 8,9   | 157         | 430         | 157     | 9,8                   | 10,4  | 280         | 455         | 182     | 14,2                  | 13,9  | 313         | 494         | 197     | 21,4                  | 17,8  |
| compact 201 C     | 431         | 930         | 225     | 42,4                  | 17,8  | 225         | 930         | 225     | 48                    | 22,3  | 456         | 955         | 250     | 82,3                  | 29,8  | 495         | 970         | 265     | 80,8                  | 29,8  |
| welded 201 W      | 931         | 2575        | 225     | 72,6                  | 3,9   | 225         | 2830        | 225     | 87,7                  | 6,9   | 956         | 3135        | 250     | 142,8                 | 10,8  | 971         | 3495        | 265     | 147,4                 | 10,8  |

Special lengths on request

\* first value for Hydraulic Shock and Sway Suppressor size 1/4", 1/2" and 1", second value for size 1 1/2"

# Sway struts



## 3. Sway struts

### 3.1 Application

Sway struts are employed primarily as tension-compression elements for bearing dynamic loads. Sway struts can also be used as pipeline guides or axial stops.

### 3.2 Construction and quality characteristics

A sway strut is composed of a base body and two threaded inserts with swivel heads (fig. E1 with only two swivel heads). The finer of the two threads is used for balancing out installation tolerance. The type and dimension of the sway strut is determined by the nominal load and the total required installation length. PSS sway struts allow a maximum deflection perpendicular to the bolt axis of  $\pm 70^\circ$  and in the bolt axis of  $\pm 5^\circ$ .

The following documents were taken into consideration in the dimensioning of PSS sway struts:

VGB Guidelines (Richtlinien)  
KTA 3205.3  
DIN 1050, DIN 4100  
BS 3974, Part 1  
ANSI B31.1  
MSS SP 58  
MSS SP 69  
SVDB Guidelines (Richtlinien)  
ASME Section III Subsection NF

### 3.3 Design Variations

#### Standard design

Regular PSS sway struts are made from carbon steels and have a zinc-iron coating as standard. Pivot bearings are obtained from reputable manufacturers. Maintenance-free pivot bearings are used as standard, while mandatory-maintenance models are employed in nuclear applications.

#### Special designs

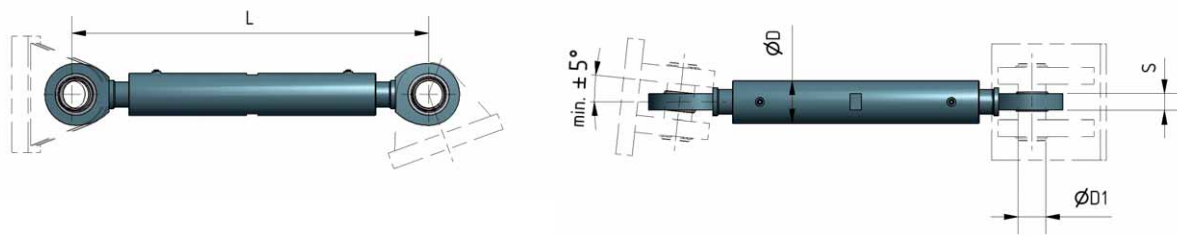
As with hydraulic shock suppressors and vibration dampers, PSS also manufactures sway struts which are suitable for use at low temperatures, made of rust-free and chloride-resistant steels for offshore use, or other special designs to customer specification.



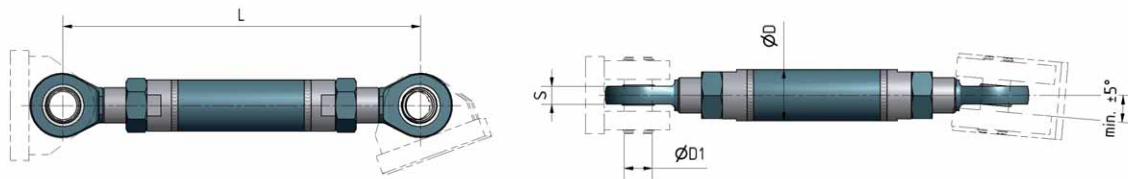
# Sway struts

## 3.4 Technical Data

Sway Strut, Fig. 211 L, Type E1, Size A0 - I



Sway Strut, Fig. 211 L, Type E2, Size A0 - R



Lmin = minimum length by total adjustability  
 Lmax = maximum length by total adjustability

Sway Strut Fig. 211L Typ E1

| Size | Nominal load | Adjustability | Lmin | Lmax | S  | ØD1 | ØD           | Weight         |           |
|------|--------------|---------------|------|------|----|-----|--------------|----------------|-----------|
|      | kN           | mm            | mm   | mm   | mm | mm  | mm           | Fixed parts kg | Pipe kg/m |
| A0   | 3            | +/- 10        | 114  | 500  | 9  | 10  | Ø20          | 0,14           | 2,47      |
| A    | 5            | +/- 10        | 130  | 500  | 10 | 12  | Ø22          | 0,22           | 2,98      |
| B    | 13           | +/- 15        | 153  | 500  | 12 | 15  | Ø25          | 0,4            | 3,85      |
| C    | 32           | +/- 20        | 188  | 550  | 16 | 20  | Ø36          | 0,7            | 7,99      |
| D    | 45           | +/- 25        | 225  | 550  | 20 | 25  | Ø45          | 1,24           | 12,5      |
| E    | 78           | +/- 30        | 323  | 600  | 25 | 35* | Ø65          | 3,18           | 26,0      |
| F    | 130          | +/- 50        | 389  | 750  | 32 | 45  | Ø76,1 x 20   | 5,82           | 27,7      |
| F1** | 180          | +/- 50        | 433  | 750  | 35 | 50  | Ø76,1 x 20   | 7,6            | 27,7      |
| G    | 234          | +/- 55        | 488  | 850  | 44 | 60  | Ø88,9 x 22,2 | 12,96          | 36,5      |
| H    | 303          | +/- 65        | 549  | 900  | 49 | 70  | Ø101,6 x 25  | 17,82          | 47,5      |
| I    | 600          | +/- 70        | 624  | 1000 | 55 | 80  | Ø114,3 x 25  | 25,98          | 55,3      |

\* validity 2011, ØD1 = 30 mm on request  
 \*\* non standard product, delivery on request  
 Size J - R on request

# Sway struts



## Sway Strut, Fig. 211 L, Type E2, Size A0 - R

| Size | Nominal load | Adjustability | Lmin | Lmax | S   | ØD1 | ØD              | Weight            |              |
|------|--------------|---------------|------|------|-----|-----|-----------------|-------------------|--------------|
|      | kN           | mm            | mm   | mm   | mm  | mm  | mm              | Fixed parts<br>kg | Pipe<br>kg/m |
| A0   | 3            | +/- 90        | 404  | 750  | 9   | 10  | 60,3 x 3,6      | 2,3               | 5,07         |
|      |              | +/- 200       | 751  | 2000 |     |     |                 | 3,08              |              |
| A    | 5            | +/- 90        | 412  | 750  | 10  | 12  | 60,3 x 3,6      | 2,32              | 5,07         |
|      |              | +/- 200       | 751  | 2000 |     |     |                 | 3,21              |              |
| B    | 13           | +/- 90        | 418  | 750  | 12  | 15  | 60,3 x 3,6      | 2,52              | 5,07         |
|      |              | +/- 200       | 751  | 2500 |     |     |                 | 3,36              |              |
| C    | 32           | +/- 90        | 506  | 940  | 16  | 20  | 76,1 x 7,1      | 8,64              | 12,1         |
|      |              | +/- 200       | 941  | 3000 |     |     |                 | 12,35             |              |
| D    | 45           | +/- 90        | 518  | 940  | 20  | 25  | 76,1 x 7,1      | 9,14              | 12,1         |
|      |              | +/- 200       | 941  | 3000 |     |     |                 | 12,98             |              |
| E    | 78           | +/- 90        | 564  | 980  | 25  | 35* | 76,1 x 7,1      | 10,33             | 12,1         |
|      |              | +/- 200       | 981  | 3000 |     |     |                 | 13,46             |              |
| F    | 130          | +/- 90        | 610  | 1050 | 32  | 45  | 101,6 x 10      | 20,69             | 22,6         |
|      |              | +/- 200       | 1051 | 3000 |     |     |                 | 27,21             |              |
| F1** | 180          | +/- 90        | 628  | 1050 | 35  | 50  | 101,6 x 10      | 21,64             | 22,6         |
|      |              | +/- 200       | 1051 | 3000 |     |     |                 | 27,59             |              |
| G    | 234          | +/- 90        | 680  | 1100 | 44  | 60  | 139,7 x 10      | 46,38             | 32           |
|      |              | +/- 200       | 1101 | 3000 |     |     |                 | 53,88             |              |
| H    | 303          | +/- 90        | 732  | 1160 | 49  | 70  | 139,7 x 10      | 52,58             | 32           |
|      |              | +/- 200       | 1161 | 3000 |     |     |                 | 59,98             |              |
| I    | 600          | +/- 90        | 800  | 1260 | 55  | 80  | 168,3 x 10      | 80,73             | 39           |
|      |              | +/- 200       | 1261 | 3000 |     |     |                 | 90,03             |              |
| J    | 750          | +/- 90        | 852  | 1500 | 60  | 90  | 177,8 x<br>17,5 | 95,2              | 69,1         |
|      |              | +/- 200       | 1501 | 4000 |     |     |                 | 111,6             |              |
| K    | 900          | +/- 90        | 852  | 1500 | 60  | 90  | 177,8 x<br>17,5 | 99,4              | 69,1         |
|      |              | +/- 200       | 1501 | 4000 |     |     |                 | 118,6             |              |
| L    | 1000         | +/- 90        | 872  | 1500 | 70  | 100 | 177,8 x<br>17,5 | 109,8             | 69,1         |
|      |              | +/- 200       | 1501 | 4000 |     |     |                 | 129               |              |
| M    | 1250         | +/- 90        | 906  | 1500 | 70  | 110 | 219,1 x<br>22,2 | 166,5             | 108          |
|      |              | +/- 200       | 1501 | 5000 |     |     |                 | 193,3             |              |
| N    | 1750         | +/- 90        | 952  | 1600 | 85  | 120 | 219,1 x<br>22,2 | 195,2             | 108          |
|      |              | +/- 200       | 1601 | 5000 |     |     |                 | 225,6             |              |
| O    | 2000         | +/- 90        | 1080 | 1600 | 90  | 140 | 273 x 25        | 325               | 154          |
|      |              | +/- 200       | 1601 | 6000 |     |     |                 | 368,8             |              |
| P    | 2500         | +/- 90        | 1142 | 1700 | 105 | 160 | 273 x 25        | 420,2             | 154          |
|      |              | +/- 200       | 1701 | 6000 |     |     |                 | 474,6             |              |
| Q    | 3000         | +/- 90        | 1198 | 1800 | 105 | 180 | 406,4 x 25      | 535,8             | 237          |
|      |              | +/- 200       | 1801 | 8000 |     |     |                 | 601,4             |              |
| R    | 4000         | +/- 90        | 1306 | 1900 | 130 | 200 | 406,4 x 25      | 645,2             | 237          |
|      |              | +/- 200       | 1901 | 8000 |     |     |                 | 732,2             |              |

\* validity 2011, ØD1 = 30 mm on request

\*\* non standard product, delivery on request

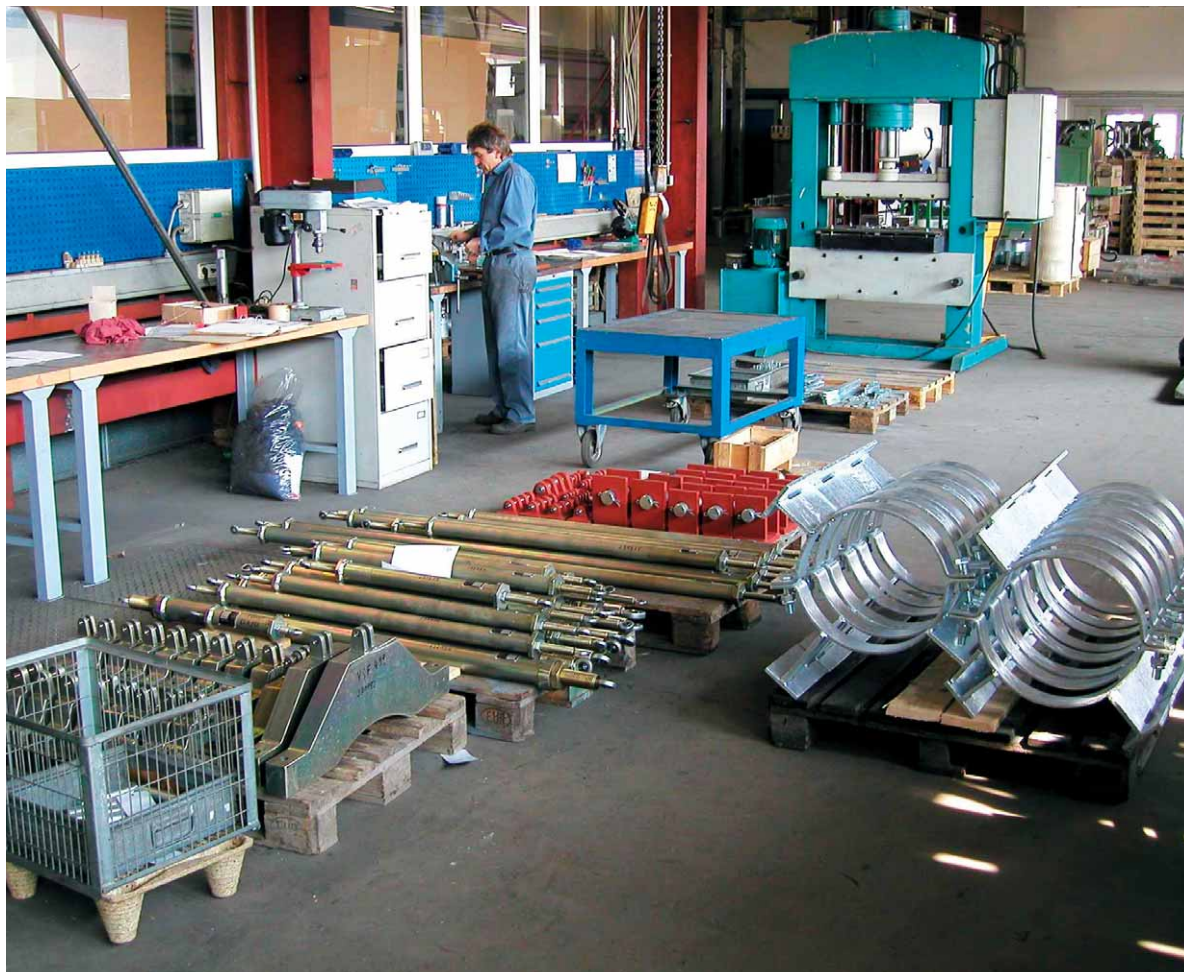
# Weld-on brackets

## 4. Weld-on brackets

The bracket EHS14S serves as the connecting element between the hydraulic shock suppressor or sway strut and the steel construction, for the transmission of dynamic forces. Since it is a connecting element, the allowable loads are matched exactly to the corresponding main components. Brackets are produced in the following versions:

The brackets can be supplied as special designs with bolted on baseplates. The load bolt can also be supplied as a special option with split pins or nuts.

|  | Basic body | Locating bolt | Retaining device                   |
|--|------------|---------------|------------------------------------|
| Standard version                                   | S355J2G3   | 1.4057        | Shaft retaining ring made of SS A2 |
| Low temperatures to $-48\text{ }^{\circ}\text{C}$  | P355NL1    | 1.7225        | Shaft retaining ring made of SS A4 |
| Low temperatures to $-170\text{ }^{\circ}\text{C}$ | 1.4301     | 1.4301        | Shaft retaining ring made of SS A4 |
| Offshore   | 1.4404     | 1.4462        | Shaft retaining ring made of SS A4 |

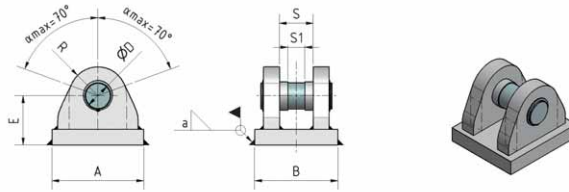


# Weld-on brackets

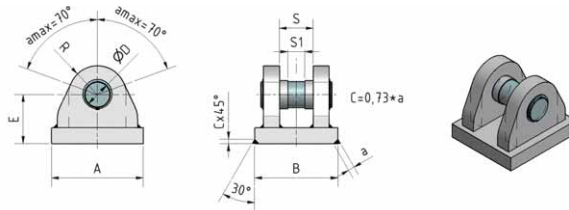


## Weld-on brackets, EHS 14S, Size A0 - R

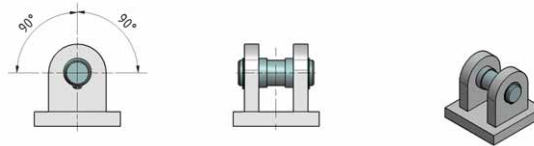
standard rear bracket EHS 14S Size A0 – M



standard rear bracket EHS 14S Size N – R



special rear bracket EHS 14S B (on request)



| Size | No-minal load | HSB      | Fig. 211L | E   | S    | S1    | A   | B   | ØD H7 | R    | a        |       |       | Weight |
|------|---------------|----------|-----------|-----|------|-------|-----|-----|-------|------|----------|-------|-------|--------|
|      |               |          |           |     |      |       |     |     |       |      | S35512G3 |       |       |        |
|      |               |          |           |     |      |       |     |     |       |      | a=0°     | a=30° | a=70° |        |
| mm   |               |          |           |     |      |       |     |     |       |      |          |       |       | kg     |
| A0   | 3             |          | A0        | 26  | 13,5 | 9,5   | 34  | 34  | 10    | 10   | 4        | 4     | 4     | 0,3    |
| A*** | 8             | ¼" ½" 1" | A         | 35  | 15,5 | 10,5  | 55  | 65  | 10/12 | 15   | 4        | 4     | 4     | 0,5    |
| B    | 13            | 1 ½"     | B         | 40  | 18,5 | 12,5  | 65  | 80  | 15    | 17,5 | 4        | 4     | 4     | 1      |
| C    | 32            |          | C         | 50  | 30,5 | 16,5  | 100 | 110 | 20    | 22,5 | 4        | 4     | 4     | 2,8    |
| D    | 45            | 2 ½"     | D         | 60  | 35,5 | 20,5  | 120 | 120 | 25    | 30   | 4        | 4     | 4     | 3,8    |
| E    | 78            | 3 ¼"     | E         | 70  | 40,5 | 25,5  | 140 | 140 | 35*   | 30   | 4        | 4     | 4     | 6,8    |
| F    | 130           | 4"       | F         | 85  | 55,5 | 32,5  | 180 | 180 | 45    | 45   | 4        | 4     | 4     | 13,8   |
| F1** | 180           |          | F1        | 105 | 64,5 | 35,5  | 210 | 210 | 50    | 58   | 4        | 4     | 4     | 22,8   |
| G    | 234           | 5"       | G         | 120 | 70,5 | 44,5  | 260 | 240 | 60    | 65   | 4        | 4     | 4     | 36,5   |
| H    | 380           | 6"       | H         | 140 | 80,5 | 49,5  | 340 | 280 | 70    | 75   | 4        | 4     | 5     | 64,2   |
| I    | 600           | 8 ½"     | I         | 155 | 90,5 | 55,5  | 420 | 300 | 80    | 90   | 4        | 5     | 6     | 85,5   |
| J    | 750           |          | J         | 170 | 120  | 61,7  | 320 | 290 | 90    | 100  | 6        | 8     | 9     | 88,3   |
| K    | 900           | 10"      | K         | 170 | 120  | 61,7  | 350 | 288 | 90    | 105  | 6        | 9     | 10    | 96,2   |
| L    | 1000          |          | L         | 200 | 120  | 71,7  | 360 | 300 | 100   | 110  | 6        | 10    | 11    | 118,6  |
| M    | 1250          | 12"      | M         | 200 | 135  | 71,7  | 460 | 315 | 110   | 120  | 6        | 10    | 11    | 151    |
| N    | 1750          | 14"      | N         | 225 | 135  | 86,9  | 470 | 330 | 120   | 135  | 8        | 13    | 15    | 200,5  |
| O    | 2000          |          | O         | 245 | 165  | 91,9  | 540 | 370 | 140   | 165  | 8        | 13    | 15    | 271,8  |
| P    | 2500          |          | P         | 265 | 205  | 106,9 | 560 | 410 | 160   | 180  | 10       | 14    | 17    | 325,8  |
| Q    | 3000          |          | Q         | 300 | 210  | 107,2 | 650 | 500 | 180   | 200  | 10       | 14    | 17    | 482,9  |
| R    | 4000          |          | R         | 320 | 230  | 132,2 | 850 | 550 | 200   | 230  | 11       | 15    | 17    | 689,4  |

\* validity 2011, ØD = 30 mm on request

\*\* non standard product

\*\*\* ØD H7 10 mm for HSB ¼" ½" 1"

# Dynamic load clamps

## 5. Dynamic load clamps

Dynamic load clamps are connecting elements between hydraulic shock suppressors or sway struts and the pipelines. PSS offers four types of dynamic load clamps:

Fig. 211R shows the conventional three-bolt pipe clamp for dynamic loads, designed for small to medium nominal pipe widths and lower design loads. The "displacement" of the pipe clamp on the pipeline in the axial direction is prevented through the use of shear lugs. Lateral "displacement" is prevented through the appropriate tightening torque of the screw fitting as the specified load requires.

Fig. EHS17D shows the universal clamp for dynamic loads. Designed as a strap clamp, the standard design covers nominal pipe diameters ranging from 6" to 48" and insulation thicknesses up to 300 mm. The available loads depending on the material, insulation thickness and temperature can simply be read off from the load table. A single shear lug welded onto the pipe serves as an anti-torsion device. The shear lug which is made of similar material to the pipe, must be supplied by the pipe fabricator and welded on according to the corresponding welding instructions.

The dynamic clamp Fig. EHS18S was designed for extremely high loads and high pipe wall thicknesses and covers the range above which it is no longer practical to manufacture the EHS17D clamp.

For double suspension fittings, PSS offers the riser clamp shown in Fig. 403D designed as a box clamp.

The values for the design of the dynamic load clamps can be taken from the installation size and stress tables of the individual pipe clamp types.

The shear lug sizes for the pipe clamps EHS17D and EHS18S can be dimensioned according to the values of the installation size tables.

### Requested ordering data for Dynamic Load Clamps:

- kind of Connection  
(Fig-No. of Snubber or Sway Strut)
- Nominal Load
- Pipe Diameter
- Design Temperature
- Insulation Thickness

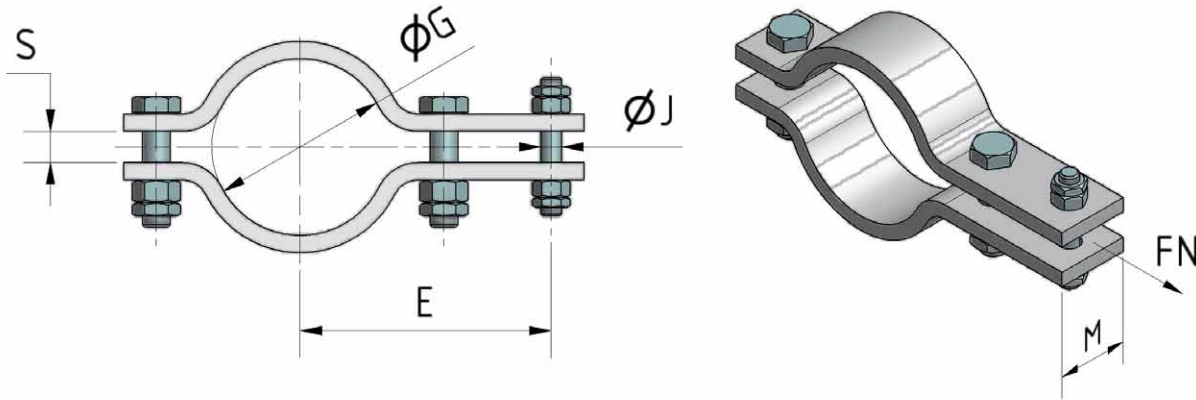




# Dynamic load clamps



## 5.1 Dynamic three bolt clamp, Fig. 211R, Pipe size NW15 to NW600



### Installation dimensions and weight data sheet, Fig. 211R, Size A0 - C

| Pipe Size |     | ØG  | Sway Strut Size, Fig. 211L                  |     |            |        |        |     |            |        |     |     |            |        |
|-----------|-----|-----|---|-----|------------|--------|--------|-----|------------|--------|-----|-----|------------|--------|
|           |     |     | A0, A                                       |     |            |        | B      |     |            |        | C   |     |            |        |
|           |     |     | Hydraulic Snubber Size, Fig. 200A/B /201A/B |     |            |        |        |     |            |        |     |     |            |        |
|           |     |     | 1/4", 1/2", 1"                              |     |            |        | 1 1/2" |     |            |        | -   |     |            |        |
| inch      | mm  | mm  | E   | M   | max Insul. | Weight | E      | M   | max Insul. | Weight | E   | M   | max Insul. | Weight |
|           |     |     | mm  | mm  | mm         | kg     | mm     | mm  | mm         | kg     | mm  | mm  | mm         | kg     |
| 1/2       | 15  | 22  | 80  | 30  | 70         | 0,6    | 85     | 40  | 75         | 1,3    | -   | -   | -          | -      |
| 3/4       | 20  | 27  | 85  | 30  | 75         | 0,6    | 90     | 40  | 80         | 1,4    | -   | -   | -          | -      |
| 1         | 25  | 34  | 95  | 30  | 85         | 0,7    | 100    | 40  | 90         | 1,5    | 115 | 60  | 105        | 3,6    |
| 1 1/4     | 32  | 43  | 100   | 40  | 90         | 0,9    | 105    | 40  | 95         | 1,5    | 120 | 60  | 110        | 3,8    |
| 1 1/2     | 40  | 49  | 105   | 40  | 95         | 1,0    | 110    | 40  | 100        | 1,6    | 125 | 60  | 115        | 3,3    |
| 2         | 50  | 61  | 110   | 40  | 100        | 1,1    | 120    | 50  | 110        | 2,0    | 135 | 60  | 125        | 4,9    |
| 2 1/2     | 65  | 77  | 120   | 40  | 110        | 1,2    | 130    | 50  | 120        | 2,6    | 150 | 60  | 140        | 5,3    |
| 3         | 80  | 90  | 130   | 40  | 120        | 1,6    | 140    | 50  | 130        | 2,8    | 160 | 60  | 150        | 5,7    |
| 3 1/2     | 90  | 102 | 135   | 40  | 125        | 1,7    | 145    | 50  | 135        | 2,9    | 170 | 60  | 160        | 6,0    |
| 4         | 100 | 115 | 145   | 40  | 135        | 1,8    | 155    | 60  | 145        | 3,6    | 180 | 70  | 170        | 7,2    |
| 5         | 125 | 141 | 155   | 50  | 145        | 2,4    | 165    | 70  | 155        | 4,5    | 190 | 70  | 180        | 7,8    |
| 6         | 150 | 169 | 175   | 50  | 165        | 2,7    | 185    | 80  | 175        | 5,7    | 210 | 80  | 200        | 9,7    |
| 8         | 200 | 220 | 195   | 60  | 185        | 3,8    | 215    | 70  | 205        | 7,0    | 240 | 100 | 230        | 13,8   |
| 10        | 250 | 274 | 225   | 60  | 215        | 5,5    | 245    | 80  | 235        | 9,3    | 270 | 80  | 260        | 17,0   |
| 12        | 300 | 325 | 250   | 60  | 240        | 6,3    | 270    | 80  | 260        | 13,1   | 295 | 100 | 285        | 23,4   |
| 14        | 350 | 360 | 270   | 60  | 260        | 6,8    | 290    | 80  | 280        | 14,2   | 315 | 100 | 305        | 25,1   |
| 16        | 400 | 411 | 310   | 60  | 300        | 7,8    | 330    | 80  | 320        | 16,0   | 355 | 100 | 345        | 27,9   |
| 18        | 450 | 463 | 330   | 80  | 320        | 11,2   | 350    | 80  | 340        | 17,5   | 375 | 100 | 365        | 30,2   |
| 20        | 500 | 514 | 360   | 80  | 350        | 12,6   | 380    | 100 | 370        | 23,8   | 405 | 150 | 395        | 49,2   |
| 22        | 550 | 565 | 400   | 100 | 390        | 17,2   | 420    | 100 | 410        | 26,3   | 450 | 150 | 440        | 53,9   |
| 24        | 600 | 617 | 430   | 100 | 420        | 18,6   | 450    | 100 | 440        | 28,3   | 480 | 150 | 470        | 58,1   |

larger pipe size and special dimensions on request

# Dynamic load clamps

## Installation dimensions and weight data sheet, Fig. 211R, Size D - E

| Pipe Size |     | Ø G | Sway Strut Size, Fig. 211L                  |     |           |      |        |     |           |       |   |    |
|-----------|-----|-----|---|-----|-----------|------|--------|-----|-----------|-------|---|----|
|           |     |     | D   |     |           |      | E      |     |           |       |   |    |
|           |     |     | Hydraulic Snubber Size, Fig. 200A/B, 201A/B |     |           |      |        |     |           |       |   |    |
|           |     |     | 2 1/2"                                      |     |           |      | 3 1/4" |     |           |       |   |    |
| Inch      | mm  | mm  | E   | M   | max Isol. | Gew  | E      | M   | max Isol. | Gew.  |   |    |
|           |     |     |   | mm  |           |      |        | kg  |           | mm    |   | kg |
| 1/2       | 15  | 22  | –   | –   | –         | –    | –      | –   | –         | –     | – |    |
| 3/4       | 20  | 27  | –   | –   | –         | –    | –      | –   | –         | –     | – |    |
| 1         | 25  | 34  | –   | –   | –         | –    | –      | –   | –         | –     | – |    |
| 1 1/4     | 32  | 43  | –   | –   | –         | –    | –      | –   | –         | –     | – |    |
| 1 1/2     | 40  | 49  | –   | –   | –         | –    | –      | –   | –         | –     | – |    |
| 2         | 50  | 61  | –   | –   | –         | –    | –      | –   | –         | –     | – |    |
| 2 1/2     | 65  | 77  | 160   | 80  | 145       | 10,2 | 180    | 80  | 160       | 9,7   |   |    |
| 3         | 80  | 90  | 175   | 80  | 160       | 10,9 | 190    | 80  | 170       | 10,3  |   |    |
| 3 1/2     | 90  | 102 | 185   | 80  | 170       | 11,5 | 200    | 80  | 180       | 10,8  |   |    |
| 4         | 100 | 115 | 200   | 80  | 185       | 12,2 | 220    | 80  | 200       | 11,7  |   |    |
| 5         | 125 | 141 | 210   | 80  | 195       | 13,2 | 235    | 100 | 215       | 15,8  |   |    |
| 6         | 150 | 169 | 230   | 80  | 215       | 14,4 | 260    | 120 | 240       | 20,8  |   |    |
| 8         | 200 | 220 | 260   | 100 | 245       | 20,1 | 290    | 150 | 270       | 29,7  |   |    |
| 10        | 250 | 274 | 290   | 100 | 275       | 22,8 | 325    | 150 | 305       | 44,1  |   |    |
| 12        | 300 | 325 | 315   | 120 | 300       | 29,9 | 350    | 150 | 330       | 49,0  |   |    |
| 14        | 350 | 360 | 335   | 150 | 320       | 39,5 | 370    | 150 | 350       | 52,2  |   |    |
| 16        | 400 | 411 | 375   | 150 | 360       | 43,8 | 410    | 180 | 390       | 69,0  |   |    |
| 18        | 450 | 463 | 395   | 150 | 380       | 47,4 | 435    | 180 | 415       | 74,6  |   |    |
| 20        | 500 | 514 | 425   | 200 | 410       | 68,1 | 465    | 200 | 445       | 93,4  |   |    |
| 22        | 550 | 565 | 475   | 200 | 460       | 74,8 | 515    | 220 | 495       | 107,3 |   |    |
| 24        | 600 | 617 | 505   | 200 | 490       | 80,2 | 540    | 250 | 230       | 129,5 |   |    |

## Connecting dimensions for Snubbers and Sway Struts

| Fig. 211R | Fig. Size |               | Pipe Size [mm] |               | Nominal load |               | ØJ        | S  |
|-----------|-----------|---------------|----------------|---------------|--------------|---------------|-----------|----|
|           | 211L      | 200A/B 201A/B | 211L           | 200A/B 201A/B | 211L         | 200A/B 201A/B |           |    |
|           |           |               |                |               | kN           | kN            | mm        | mm |
|           | A0        | –             | 15 – 600       | –             | 3            | –             | 10        | 15 |
|           | A         | 1/4" 1/2" 1"  | 15 – 600       | 15 – 600      | 5            | 8             | 10 / 12 * | 15 |
|           | B         | 1 1/2"        | 15 – 600       | 90 – 600      | 13           | 13            | 15        | 18 |
|           | C         | –             | 25 – 600       | –             | 32           | 32            | 20        | 30 |
|           | D         | 2 1/2"        | 65 – 600       | 90 – 600      | 45           | 45            | 25        | 35 |
|           | E         | 3 1/4"        | 65 – 600       | 90 – 600      | 78           | 78            | 35        | 40 |

special clamps on request

\* for Hydraulic Shock and Sway Suppressor ØJ = 10 mm, for Sway Strut ØJ = 12 mm

# Dynamic load clamps



## Load data sheet for Dynamic three bolt clamp, Figure 211R

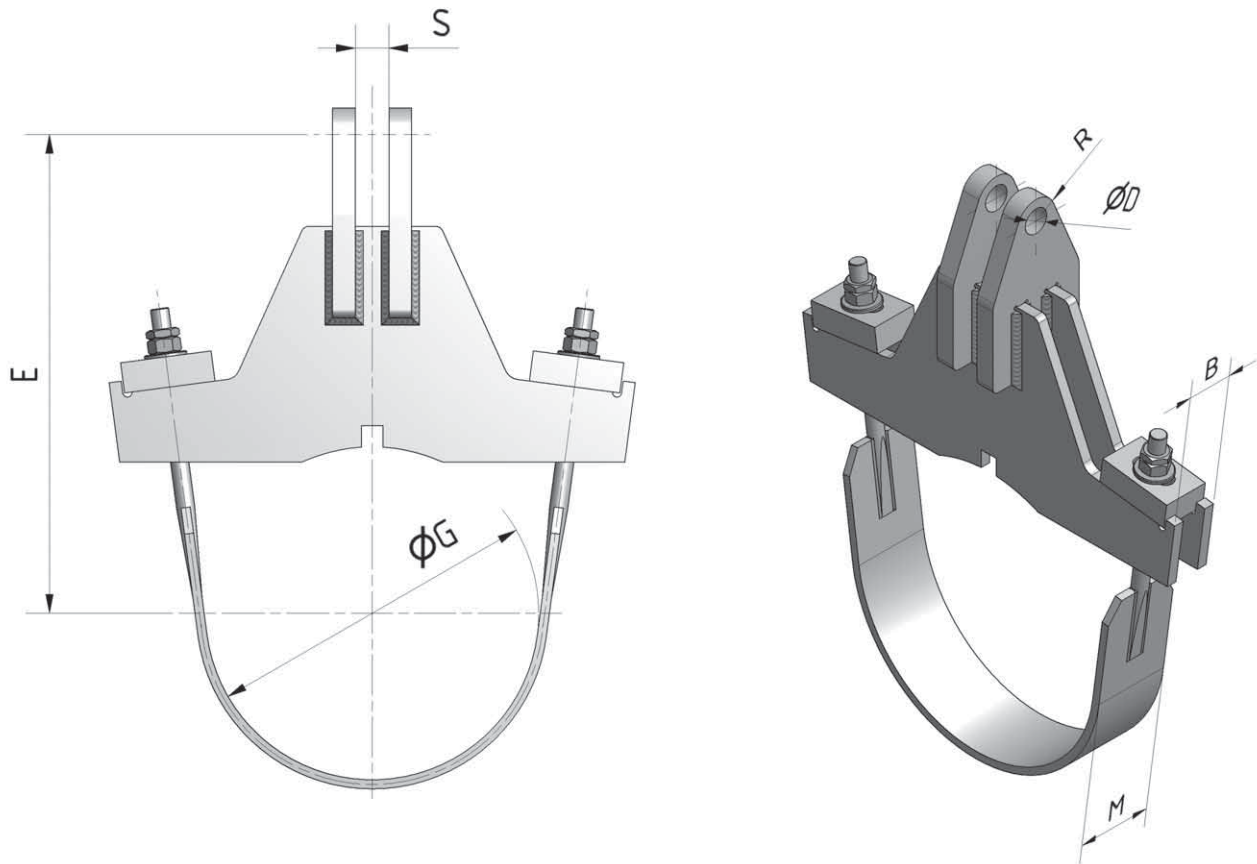
| Size     | Size         | FN       | FN          | Pipe Size | Allowable loads   |       |       |                |       |                       |       |       |  |
|----------|--------------|----------|-------------|-----------|-------------------|-------|-------|----------------|-------|-----------------------|-------|-------|--|
| Temp. °C | Temp. °C     | Fig. 211 | Fig. 200A/B |           | 80°C              | 150°C | 300°C | 400°C          | 500°C | 80°C                  | 300°C | 550°C |  |
| Material | Material     |          | 201A/B      |           | S355J2G3 (1.0570) |       |       | 16Mo3 (1.5415) |       | X6CrNiTi18 10(1.4541) |       |       |  |
| Fig. 211 | Fig. 200/201 | KN       | KN          | mm        | KN                |       |       |                |       |                       |       |       |  |
| A0       | –            | 3,0      | –           | 15 – 600  | 3,0               | 3,0   | 3,0   | 3,0            | 3,0   | 3,0                   | 3,0   | 3,0   |  |
| A        | 1/4"1/2"1"   | 5,0      | 8,0         | 15 – 600  | 5,0               | 5,0   | 5,0   | 5,0            | 5,0   | 5,0                   | 5,0   | 5,0   |  |
| B        | 1 1/2"       | 13,0     | 13,0        | 15 – 600  | 13,0              | 13,0  | 13,0  | 13,0           | 13,0  | 13,0                  | 13,0  | 13,0  |  |
| C        | –            | 32,0     | –           | 25 – 600  | 32,0              | 32,0  | 32,0  | 32,0           | 32,0  | 32,0                  | 32,0  | 32,0  |  |
| D        | 2 1/2"       | 45,0     | 45,0        | 65 – 600  | 45,0              | 45,0  | 45,0  | 45,0           | 45,0  | 45,0                  | 45,0  | 45,0  |  |
| E        | 3 1/4"       | 78,0     | 78,0        | 65 – 600  | 78,0              | 78,0  | 78,0  | 78,0           | 78,0  | 78,0                  | 78,0  | 78,0  |  |

| Size     | Size         | FN       | FN          | Pipe Size | Allowable loads    |       |       |                     |       |                        |       |       |       |  |
|----------|--------------|----------|-------------|-----------|--------------------|-------|-------|---------------------|-------|------------------------|-------|-------|-------|--|
| Temp. °C | Temp. °C     | Fig. 211 | Fig. 200A/B |           | 400°C              | 500°C | 540°C | 540°C               | 560°C | 580°C                  | 560°C | 600°C | 650°C |  |
| Material | Material     |          | 201A/B      |           | 13CrMo4-5 (1.7335) |       |       | 10CrMo9-10 (1.7380) |       | X10CrMoVNB9-1 (1.4903) |       |       |       |  |
| Fig. 211 | Fig. 200/201 | KN       | KN          | mm        | KN                 |       |       |                     |       |                        |       |       |       |  |
| A0       | –            | 3,0      | –           | 15 – 600  | 3,0                | 3,0   | 3,0   | 3,0                 | 2,6   | 1,8                    | 3,0   | 3,0   | 2,6   |  |
| A        | 1/4"1/2"1"   | 5,0      | 8,0         | 15 – 600  | 5,0                | 5,0   | 3,2   | 3,5                 | 2,6   | 1,8                    | 5,0   | 5,0   | 2,6   |  |
| B        | 1 1/2"       | 13,0     | 13,0        | 15 – 600  | 13,0               | 13,0  | 8,6   | 9,3                 | 6,9   | 4,8                    | 13,0  | 13,0  | 6,8   |  |
| C        | –            | 32,0     | –           | 15 – 600  | 32,0               | 32,0  | 19,6  | 21,9                | 16,2  | 11,4                   | 32,0  | 32,0  | 15,9  |  |
| D        | 2 1/2"       | 45,0     | 45,0        | 15 – 600  | 45,0               | 45,0  | 28,0  | 31,3                | 23,1  | 16,2                   | 45,0  | 45,0  | 22,7  |  |
| E        | 3 1/4"       | 78,0     | 78,0        | 15 – 600  | 78,0               | 78,0  | 46,6  | 52,0                | 38,5  | 27,0                   | 78,0  | 78,0  | 37,8  |  |

Higher loads or special materials on request

# Dynamic load clamps

## 5.2 Dynamic yoke clamp EHS17D



### Installation dimensions for Snubbers and Sway Struts

| Snubber      | Sway Strut | Load [kN]    |          | ØD [mm]      |          | S [mm]       |          | R [mm] |
|--------------|------------|--------------|----------|--------------|----------|--------------|----------|--------|
|              |            | Fig. 200/201 | Fig. 211 | Fig. 200/201 | Fig. 211 | Fig. 200/201 | Fig. 211 |        |
| –            | A0         | –            | 3        | 10           | 10       | –            | 16,2     | 10     |
| 1/4" 1/2" 1" | A          | 8            | 5        | 10           | 12       | 16,2         | 15,5     | 15     |
| 1 1/2"       | B          | 13           | 13       | 15           | 15       | 18,5         | 18,5     | 17,5   |
| –            | C          | –            | 32       | –            | 20       | –            | 30,5     | 22,5   |
| 2 1/2"       | D          | 45           | 45       | 25           | 25       | 35,5         | 35,5     | 30     |
| 3 1/4"       | E          | 78           | 78       | 35           | 35       | 40,5         | 40,5     | 30     |
| 4"           | F          | 121          | 130      | 45           | 45       | 55,5         | 55,5     | 45     |
| –            | F1         | –            | 180      | –            | 50       | –            | 64,5     | 58     |
| 5"           | G          | 202          | 234      | 60           | 60       | 70,5         | 70,5     | 65     |
| 6"           | –          | 303          | –        | 70           | –        | 80,5         | –        | 75     |

EHS 17D over 303 kN on request

# Dynamic load clamps



## Installation dimensions and weight data sheet, Fig. EHS 17D

| Ver-<br>sion | ØDA    | Pipe size |      | ØG   | M    | Insulation   |      |        |              |      |        |              |      |        |
|--------------|--------|-----------|------|------|------|--------------|------|--------|--------------|------|--------|--------------|------|--------|
|              |        |           |      |      |      | up to 100 mm |      |        | up to 200 mm |      |        | up to 300 mm |      |        |
|              |        |           |      |      |      | E            | B    | Weight | E            | B    | Weight | E            | B    | Weight |
| [mm]         | [mm]   | [inch]    | [mm] | [mm] | [mm] | [mm]         | [kg] | [mm]   | [mm]         | [kg] | [mm]   | [mm]         | [kg] |        |
| L            | 168,3  | 150       | 6    | 170  | 50   | 240          | 32   | 6,2    | 330          | 32   | 7,0    | -            | -    | -      |
| S            |        |           |      |      |      |              | 40   | 7,2    |              | 40   | 8,2    |              |      |        |
| L            | 219,1  | 200       | 8    | 222  | 60   | 275          | 36   | 7,9    | 365          | 36   | 8,9    | -            | -    | -      |
| S            |        |           |      |      |      |              | 44   | 9,2    |              | 44   | 10,3   |              |      |        |
| L            | 273,0  | 250       | 10   | 276  | 70   | 340          | 40   | 10,3   | 430          | 40   | 12,8   | 530          | 40   | 14,6   |
| S            |        |           |      |      | 60   |              | 52   | 18,3   |              | 48   | 20,4   |              | 48   | 23,2   |
| L            | 323,9  | 300       | 12   | 328  | 70   | 370          | 44   | 14,0   | 455          | 40   | 14,5   | 555          | 40   | 17,3   |
| S            |        |           |      |      | 60   |              | 62   | 25,9   |              | 56   | 26,7   |              | 56   | 30,4   |
| L            | 355,6  | 350       | 14   | 360  | 70   | 390          | 48   | 19,3   | 475          | 40   | 18,3   | 575          | 40   | 21,6   |
| S            |        |           |      |      | 60   |              | 72   | 31,3   |              | 56   | 28,6   |              | 56   | 33,6   |
| L            | 406,4  | 400       | 16   | 411  | 80   | 415          | 54   | 27,3   | 500          | 48   | 27,2   | 600          | 48   | 34,8   |
| S            |        |           |      |      |      |              | 82   | 46,7   |              | 62   | 41,4   |              | 62   | 49,8   |
| L            | 457,2  | 450       | 18   | 462  | 80   | 445          | 58   | 31,4   | 525          | 52   | 34,1   | 625          | 52   | 39,6   |
| S            |        |           |      |      |      |              | 82   | 51,3   |              | 62   | 47,3   |              | 62   | 53,5   |
| L            | 508,0  | 500       | 20   | 513  | 100  | 470          | 68   | 44,2   | 550          | 52   | 36,4   | 650          | 52   | 44,4   |
| S            |        |           |      |      |      |              | 92   | 68,5   |              | 62   | 50,2   |              | 62   | 60,0   |
| L            | 558,8  | 550       | 22   | 565  | 100  | 500          | 68   | 46,5   | 580          | 58   | 44,1   | 680          | 58   | 51,0   |
| S            |        |           |      |      |      |              | 92   | 67,8   |              | 72   | 58,3   |              | 72   | 67,5   |
| L            | 609,6  | 600       | 24   | 616  | 100  | 540          | 72   | 54,4   | 600          | 62   | 52,4   | 700          | 62   | 64,9   |
| S            |        |           |      |      |      |              | 98   | 85,9   |              | 78   | 77,9   |              | 78   | 94,8   |
| L            | 660,4  | 650       | 26   | 670  | 130  | 570          | 72   | 61,8   | 630          | 62   | 58,4   | 730          | 62   | 69,7   |
| S            |        |           |      |      |      |              | 98   | 86,7   |              | 78   | 76,1   |              | 78   | 91,3   |
| L            | 711,2  | 700       | 28   | 719  | 130  | 590          | 72   | 62,7   | 650          | 62   | 68,3   | 750          | 62   | 76,4   |
| S            |        |           |      |      |      |              | 98   | 98,1   |              | 78   | 99,0   |              | 78   | 109,9  |
| L            | 762,0  | 750       | 30   | 770  | 130  | 665          | 72   | 78,4   | 700          | 62   | 69,5   | 800          | 62   | 76,8   |
| S            |        |           |      |      |      |              | 98   | 107,9  |              | 88   | 100,7  |              | 88   | 112,9  |
| L            | 812,8  | 800       | 32   | 821  | 130  | 690          | 88   | 99,8   | 725          | 78   | 90,9   | 830          | 78   | 100,7  |
| S            |        |           |      |      |      |              | 114  | 131,5  |              | 94   | 111,2  |              | 94   | 123,4  |
| L            | 863,6  | 850       | 34   | 873  | 130  | 720          | 88   | 104,9  | 750          | 78   | 95,2   | 850          | 78   | 105,0  |
| S            |        |           |      |      |      |              | 114  | 139,2  |              | 94   | 116,7  |              | 94   | 129,0  |
| L            | 914,4  | 900       | 36   | 924  | 130  | 780          | 88   | 116,9  | 800          | 78   | 104,4  | 880          | 78   | 114,3  |
| S            |        |           |      |      |      |              | 114  | 154,8  |              | 104  | 143,5  |              | 104  | 158,3  |
| L            | 1016,0 | 1000      | 40   | 1027 | 150  | 840          | 94   | 137,2  | 870          | 84   | 124,3  | 940          | 84   | 134,1  |
| S            |        |           |      |      |      |              | 130  | 200,7  |              | 110  | 172,6  |              | 110  | 187,3  |
| L            | 1220,0 | 1200      | 48   | 1233 | 150  | 960          | 94   | 161,0  | 970          | 94   | 162,8  | 1040         | 94   | 175,0  |
| S            |        |           |      |      |      |              | 130  | 237,0  |              | 120  | 219,6  |              | 120  | 235,7  |

L = light version

S = heavy version

smaller and larger pipe size or special dimension on request

# Dynamic load clamps

## Load data sheet for EHS 17D - Insulation thickness 0 to 100 mm

| Version             | ØDA<br>mm | Pipe Size         |       | Allowable loads KN               |       |                |       |       |      |                    |       |       |       |                       |       |       |       |                     |       |  |  |                       |  |  |  |
|---------------------|-----------|-------------------|-------|----------------------------------|-------|----------------|-------|-------|------|--------------------|-------|-------|-------|-----------------------|-------|-------|-------|---------------------|-------|--|--|-----------------------|--|--|--|
|                     |           | mm                | Inch  | Insulation thickness 0 to 100 mm |       |                |       |       |      |                    |       |       |       |                       |       |       |       |                     |       |  |  |                       |  |  |  |
| Temp. °C            |           | 80°C              | 150°C | 300°C                            | 400°C | 500°C          | 500°C | 540°C | 80°C | 300°C              | 550°C | 540°C | 540°C | 540°C                 | 560°C | 580°C | 560°C | 600°C               | 650°C |  |  |                       |  |  |  |
| Insulation Material |           | S355J2G3 (1.0570) |       |                                  |       | 16Mo3 (1.5415) |       |       |      | 13CrMo4-5 (1.7335) |       |       |       | X6CrNiTi18 10(1.4541) |       |       |       | 10CrMo9-10 (1.7380) |       |  |  | X10CrMoNb9-1 (1.4903) |  |  |  |
| L                   | 168,3     | 35                | 33    | 26                               | 21    | 19             | 25    | 23    | 16   | 18                 | 18    | 16    | 17    | 13                    | 9     | 37    | 32    | 13                  |       |  |  |                       |  |  |  |
| S                   |           | 65                | 58    | 46                               | 37    | 34             | 44    | 40    | 28   | 34                 | 34    | 29    | 31    | 23                    | 16    | 67    | 57    | 23                  |       |  |  |                       |  |  |  |
| L                   | 219,1     | 35                | 33    | 26                               | 21    | 19             | 25    | 23    | 16   | 18                 | 18    | 16    | 17    | 13                    | 9     | 37    | 32    | 13                  |       |  |  |                       |  |  |  |
| S                   |           | 65                | 58    | 46                               | 37    | 34             | 44    | 40    | 28   | 34                 | 34    | 29    | 31    | 23                    | 16    | 67    | 57    | 23                  |       |  |  |                       |  |  |  |
| L                   | 273,0     | 65                | 58    | 46                               | 37    | 34             | 44    | 40    | 28   | 34                 | 34    | 29    | 31    | 23                    | 16    | 67    | 57    | 23                  |       |  |  |                       |  |  |  |
| S                   |           | 101               | 91    | 71                               | 58    | 54             | 69    | 63    | 43   | 53                 | 53    | 45    | 48    | 36                    | 25    | 104   | 89    | 35                  |       |  |  |                       |  |  |  |
| L                   | 323,9     | 65                | 58    | 46                               | 37    | 34             | 44    | 40    | 28   | 34                 | 34    | 29    | 31    | 23                    | 16    | 67    | 57    | 23                  |       |  |  |                       |  |  |  |
| S                   |           | 146               | 126   | 99                               | 81    | 74             | 96    | 88    | 54   | 77                 | 76    | 62    | 60    | 45                    | 31    | 145   | 124   | 44                  |       |  |  |                       |  |  |  |
| L                   | 355,6     | 65                | 58    | 46                               | 37    | 34             | 44    | 40    | 28   | 34                 | 34    | 29    | 31    | 23                    | 16    | 67    | 57    | 23                  |       |  |  |                       |  |  |  |
| S                   |           | 146               | 131   | 103                              | 84    | 77             | 100   | 91    | 62   | 77                 | 76    | 64    | 70    | 52                    | 36    | 150   | 129   | 51                  |       |  |  |                       |  |  |  |
| L                   | 406,4     | 65                | 58    | 46                               | 37    | 34             | 44    | 40    | 28   | 34                 | 34    | 29    | 31    | 23                    | 16    | 67    | 57    | 23                  |       |  |  |                       |  |  |  |
| S                   |           | 146               | 131   | 103                              | 84    | 77             | 100   | 91    | 62   | 77                 | 76    | 64    | 70    | 52                    | 36    | 150   | 129   | 51                  |       |  |  |                       |  |  |  |
| L                   | 457,2     | 101               | 91    | 71                               | 58    | 54             | 69    | 63    | 39   | 53                 | 53    | 45    | 44    | 32                    | 23    | 104   | 89    | 32                  |       |  |  |                       |  |  |  |
| S                   |           | 146               | 131   | 103                              | 84    | 77             | 100   | 91    | 62   | 77                 | 76    | 64    | 70    | 52                    | 36    | 150   | 129   | 51                  |       |  |  |                       |  |  |  |
| L                   | 508,0     | 101               | 91    | 71                               | 58    | 54             | 69    | 63    | 43   | 53                 | 53    | 45    | 48    | 36                    | 25    | 104   | 89    | 35                  |       |  |  |                       |  |  |  |
| S                   |           | 146               | 131   | 103                              | 84    | 77             | 100   | 91    | 62   | 77                 | 76    | 64    | 70    | 52                    | 36    | 150   | 129   | 51                  |       |  |  |                       |  |  |  |
| L                   | 558,8     | 101               | 91    | 71                               | 58    | 54             | 69    | 63    | 43   | 53                 | 53    | 45    | 48    | 36                    | 25    | 104   | 89    | 35                  |       |  |  |                       |  |  |  |
| S                   |           | 146               | 131   | 103                              | 84    | 77             | 100   | 91    | 62   | 77                 | 76    | 64    | 70    | 52                    | 36    | 150   | 129   | 51                  |       |  |  |                       |  |  |  |
| L                   | 609,6     | 146               | 124   | 98                               | 80    | 73             | 95    | 86    | 53   | 77                 | 73    | 61    | 59    | 44                    | 31    | 143   | 123   | 43                  |       |  |  |                       |  |  |  |
| S                   |           | 232               | 187   | 147                              | 119   | 110            | 143   | 130   | 80   | 122                | 109   | 92    | 89    | 66                    | 46    | 214   | 184   | 65                  |       |  |  |                       |  |  |  |
| L                   | 660,4     | 146               | 115   | 91                               | 74    | 68             | 88    | 80    | 49   | 77                 | 67    | 57    | 55    | 41                    | 29    | 132   | 113   | 40                  |       |  |  |                       |  |  |  |
| S                   |           | 232               | 173   | 136                              | 111   | 102            | 132   | 120   | 74   | 122                | 101   | 85    | 83    | 61                    | 43    | 198   | 170   | 60                  |       |  |  |                       |  |  |  |
| L                   | 711,2     | 146               | 107   | 84                               | 69    | 63             | 82    | 74    | 46   | 77                 | 63    | 53    | 51    | 38                    | 27    | 123   | 106   | 37                  |       |  |  |                       |  |  |  |
| S                   |           | 231               | 161   | 127                              | 103   | 95             | 123   | 112   | 69   | 121                | 94    | 79    | 77    | 57                    | 40    | 185   | 158   | 56                  |       |  |  |                       |  |  |  |
| L                   | 762,0     | 146               | 129   | 101                              | 82    | 76             | 98    | 89    | 55   | 77                 | 75    | 59    | 61    | 45                    | 32    | 147   | 127   | 45                  |       |  |  |                       |  |  |  |
| S                   |           | 232               | 204   | 152                              | 123   | 114            | 147   | 134   | 83   | 122                | 112   | 95    | 92    | 68                    | 48    | 221   | 190   | 67                  |       |  |  |                       |  |  |  |
| L                   | 812,83    | 216               | 151   | 119                              | 97    | 89             | 115   | 105   | 65   | 114                | 88    | 70    | 72    | 53                    | 37    | 173   | 149   | 52                  |       |  |  |                       |  |  |  |
| S                   |           | 303               | 211   | 166                              | 135   | 125            | 162   | 147   | 90   | 159                | 123   | 104   | 101   | 75                    | 52    | 242   | 208   | 73                  |       |  |  |                       |  |  |  |
| L                   | 863,6     | 217               | 151   | 119                              | 97    | 89             | 116   | 105   | 65   | 114                | 88    | 74    | 72    | 53                    | 37    | 173   | 149   | 52                  |       |  |  |                       |  |  |  |
| S                   |           | 303               | 212   | 167                              | 135   | 125            | 162   | 147   | 91   | 160                | 123   | 104   | 101   | 75                    | 52    | 243   | 208   | 73                  |       |  |  |                       |  |  |  |
| L                   | 914,4     | 232               | 199   | 156                              | 127   | 117            | 152   | 138   | 85   | 122                | 116   | 98    | 95    | 70                    | 49    | 228   | 196   | 69                  |       |  |  |                       |  |  |  |
| S                   |           | 338               | 278   | 219                              | 178   | 164            | 213   | 193   | 119  | 178                | 162   | 137   | 133   | 98                    | 69    | 319   | 274   | 97                  |       |  |  |                       |  |  |  |
| L                   | 1016,0    | 270               | 188   | 148                              | 121   | 111            | 144   | 131   | 81   | 142                | 110   | 93    | 90    | 67                    | 47    | 216   | 185   | 65                  |       |  |  |                       |  |  |  |
| S                   |           | 432               | 301   | 237                              | 193   | 178            | 230   | 209   | 129  | 227                | 176   | 148   | 144   | 107                   | 75    | 346   | 297   | 105                 |       |  |  |                       |  |  |  |
| L                   | 1220,0    | 272               | 190   | 150                              | 122   | 112            | 145   | 132   | 81   | 143                | 111   | 93    | 91    | 67                    | 47    | 218   | 187   | 66                  |       |  |  |                       |  |  |  |
| S                   |           | 436               | 304   | 239                              | 195   | 179            | 232   | 211   | 130  | 229                | 177   | 150   | 145   | 107                   | 75    | 349   | 299   | 106                 |       |  |  |                       |  |  |  |

L = light Version      S = heavy Version      Higher loads and additional clamp materials on request

# Dynamic load clamps



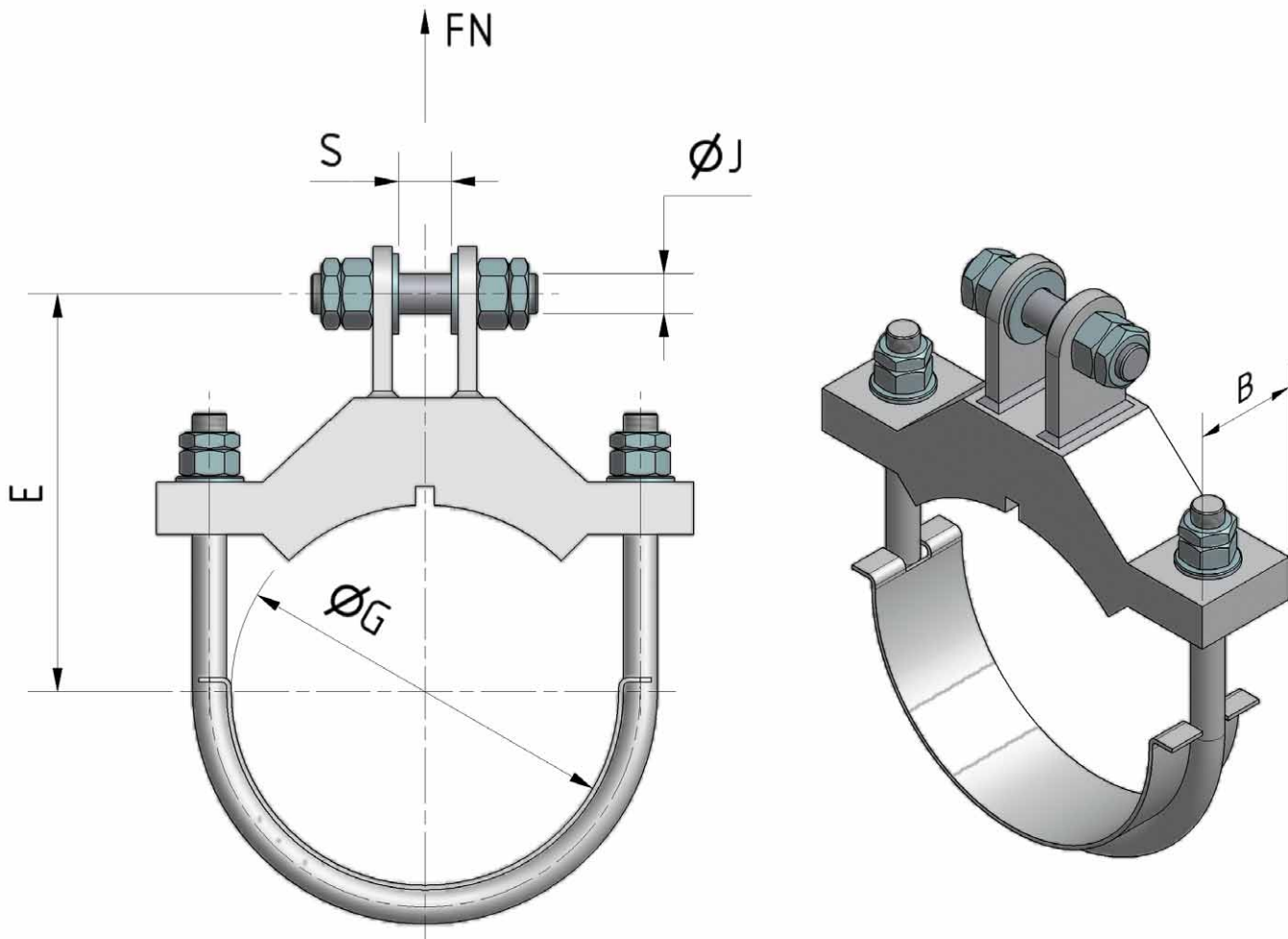
## Load data sheet for EHS 17D - Insulation thickness > 100 to 300 mm

| Version    | Temp. °C | ØDA<br>mm | Pipe size |                                      | Allowable loads KN |       |       |                |       |       |      |                    |       |       |       |                       |       |       |     |                     |     |  |  |                         |  |  |  |
|------------|----------|-----------|-----------|--------------------------------------|--------------------|-------|-------|----------------|-------|-------|------|--------------------|-------|-------|-------|-----------------------|-------|-------|-----|---------------------|-----|--|--|-------------------------|--|--|--|
|            |          |           | mm        | Inch                                 | 80°C               | 150°C | 300°C | 400°C          | 500°C | 540°C | 80°C | 300°C              | 550°C | 540°C | 580°C | 560°C                 | 600°C | 650°C |     |                     |     |  |  |                         |  |  |  |
| Insulation |          |           |           | Insulation thickness > 100 to 300 mm |                    |       |       |                |       |       |      |                    |       |       |       |                       |       |       |     |                     |     |  |  |                         |  |  |  |
| Material   |          |           |           | S355J2G3 (1.0570)                    |                    |       |       | 16Mo3 (1.5415) |       |       |      | 13CrMo4-5 (1.7335) |       |       |       | X6CrNiTi18 10(1.4541) |       |       |     | 10CrMo9-10 (1.7380) |     |  |  | X10CrNiMoNb9-1 (1.4903) |  |  |  |
| L          |          | 168,3     | 150       | 6                                    | 35                 | 33    | 26    | 21             | 19    | 25    | 23   | 16                 | 18    | 18    | 16    | 17                    | 13    | 9     | 37  | 32                  | 13  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 65                 | 58    | 46    | 37             | 34    | 44    | 40   | 28                 | 34    | 34    | 29    | 31                    | 23    | 16    | 67  | 57                  | 23  |  |  |                         |  |  |  |
| L          |          | 219,1     | 200       | 8                                    | 35                 | 33    | 26    | 21             | 19    | 25    | 23   | 16                 | 18    | 18    | 16    | 17                    | 13    | 9     | 37  | 32                  | 13  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 65                 | 58    | 46    | 37             | 34    | 44    | 40   | 28                 | 34    | 34    | 29    | 31                    | 23    | 16    | 67  | 57                  | 23  |  |  |                         |  |  |  |
| L          |          | 273,0     | 250       | 10                                   | 65                 | 58    | 46    | 37             | 34    | 44    | 40   | 28                 | 34    | 34    | 29    | 31                    | 23    | 16    | 67  | 57                  | 23  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 101                | 91    | 71    | 58             | 54    | 69    | 63   | 43                 | 53    | 53    | 45    | 48                    | 36    | 25    | 104 | 89                  | 35  |  |  |                         |  |  |  |
| L          |          | 323,9     | 300       | 12                                   | 65                 | 58    | 46    | 37             | 34    | 44    | 40   | 28                 | 34    | 34    | 29    | 31                    | 23    | 16    | 67  | 57                  | 23  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| L          |          | 355,6     | 350       | 14                                   | 65                 | 58    | 46    | 37             | 34    | 44    | 40   | 28                 | 34    | 34    | 29    | 31                    | 23    | 16    | 67  | 57                  | 23  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| L          |          | 406,4     | 400       | 16                                   | 65                 | 58    | 46    | 37             | 34    | 44    | 40   | 28                 | 34    | 34    | 29    | 31                    | 23    | 16    | 67  | 57                  | 23  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| L          |          | 457,2     | 450       | 18                                   | 101                | 91    | 71    | 58             | 54    | 69    | 63   | 43                 | 53    | 53    | 45    | 48                    | 36    | 25    | 104 | 89                  | 35  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| L          |          | 508,0     | 500       | 20                                   | 101                | 91    | 71    | 58             | 54    | 69    | 63   | 43                 | 53    | 53    | 45    | 48                    | 36    | 25    | 104 | 89                  | 35  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| L          |          | 558,8     | 550       | 22                                   | 101                | 91    | 71    | 58             | 54    | 69    | 63   | 43                 | 53    | 53    | 45    | 48                    | 36    | 25    | 104 | 89                  | 35  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| L          |          | 609,6     | 600       | 24                                   | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 232                | 204   | 161   | 131            | 120   | 156   | 142  | 98                 | 122   | 119   | 100   | 109                   | 81    | 57    | 234 | 201                 | 79  |  |  |                         |  |  |  |
| L          |          | 660,4     | 650       | 26                                   | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 232                | 204   | 161   | 131            | 120   | 156   | 142  | 91                 | 122   | 119   | 100   | 102                   | 75    | 53    | 234 | 201                 | 74  |  |  |                         |  |  |  |
| L          |          | 711,2     | 700       | 28                                   | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 232                | 199   | 156   | 127            | 117   | 152   | 138  | 85                 | 122   | 119   | 100   | 95                    | 70    | 49    | 228 | 196                 | 69  |  |  |                         |  |  |  |
| L          |          | 762,0     | 750       | 30                                   | 146                | 131   | 103   | 84             | 77    | 100   | 91   | 62                 | 77    | 76    | 64    | 70                    | 52    | 36    | 150 | 129                 | 51  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 232                | 204   | 161   | 131            | 120   | 156   | 142  | 98                 | 122   | 119   | 100   | 109                   | 81    | 57    | 234 | 201                 | 79  |  |  |                         |  |  |  |
| L          |          | 812,8     | 800       | 32                                   | 232                | 204   | 161   | 131            | 120   | 156   | 142  | 90                 | 122   | 119   | 100   | 100                   | 74    | 52    | 234 | 201                 | 73  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 338                | 263   | 207   | 168            | 155   | 201   | 182  | 112                | 178   | 171   | 145   | 125                   | 93    | 65    | 301 | 259                 | 91  |  |  |                         |  |  |  |
| L          |          | 863,6     | 850       | 34                                   | 232                | 198   | 156   | 127            | 117   | 152   | 138  | 85                 | 122   | 119   | 100   | 95                    | 70    | 49    | 228 | 195                 | 69  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 338                | 248   | 195   | 159            | 146   | 190   | 172  | 106                | 178   | 163   | 138   | 118                   | 88    | 62    | 284 | 244                 | 86  |  |  |                         |  |  |  |
| L          |          | 914,4     | 900       | 36                                   | 232                | 204   | 161   | 131            | 120   | 156   | 142  | 96                 | 122   | 119   | 100   | 107                   | 79    | 56    | 234 | 201                 | 78  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 338                | 294   | 231   | 188            | 173   | 225   | 204  | 140                | 178   | 171   | 145   | 157                   | 116   | 81    | 337 | 289                 | 114 |  |  |                         |  |  |  |
| L          |          | 1016,0    | 1000      | 40                                   | 328                | 229   | 180   | 146            | 135   | 175   | 159  | 98                 | 178   | 151   | 100   | 109                   | 81    | 57    | 263 | 225                 | 79  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 464                | 343   | 270   | 220            | 203   | 263   | 238  | 147                | 244   | 226   | 191   | 164                   | 121   | 85    | 394 | 338                 | 119 |  |  |                         |  |  |  |
| L          |          | 1220,0    | 1200      | 48                                   | 338                | 240   | 189   | 154            | 142   | 184   | 167  | 103                | 178   | 158   | 133   | 115                   | 85    | 60    | 275 | 236                 | 83  |  |  |                         |  |  |  |
| S          |          |           |           |                                      | 464                | 336   | 264   | 215            | 198   | 257   | 233  | 144                | 244   | 222   | 187   | 160                   | 119   | 83    | 385 | 331                 | 117 |  |  |                         |  |  |  |

L = light Version      S = heavy Version      Higher loads and additional clamp materials on request

# Dynamic load clamps

## 5.3 Dynamic U-Bolt clamp, EHS 18S, Pipe size NW 125 to NW 1200



### Connecting dimensions for Snubbers and Sway Struts

| EHS 18S | Figure |      | Nominal load FN [kN] |       |            |       | ØJ   | S    |
|---------|--------|------|----------------------|-------|------------|-------|------|------|
|         | 200A/B | 211L | S235JRG2             |       | 13CrMo 4 5 |       |      |      |
|         | 201A/B |      | 80°C                 | 300°C | 300°C      | 500°C | [mm] |      |
| Size 1  | 3 1/4" | E    | 78                   | 44,8  | 81,8       | 66,5  | 35   | 22,5 |
| Size 2  | 4"     | F    | 130                  | 74,8  | 136,3      | 110,9 | 45   | 32,5 |
| Size 3  | 5"     | G    | 234                  | 134,6 | 245,4      | 199,7 | 60   | 44,5 |
| Size 4  | 6"     | H    | 303                  | 174,4 | 317,7      | 258,6 | 70   | 49,5 |



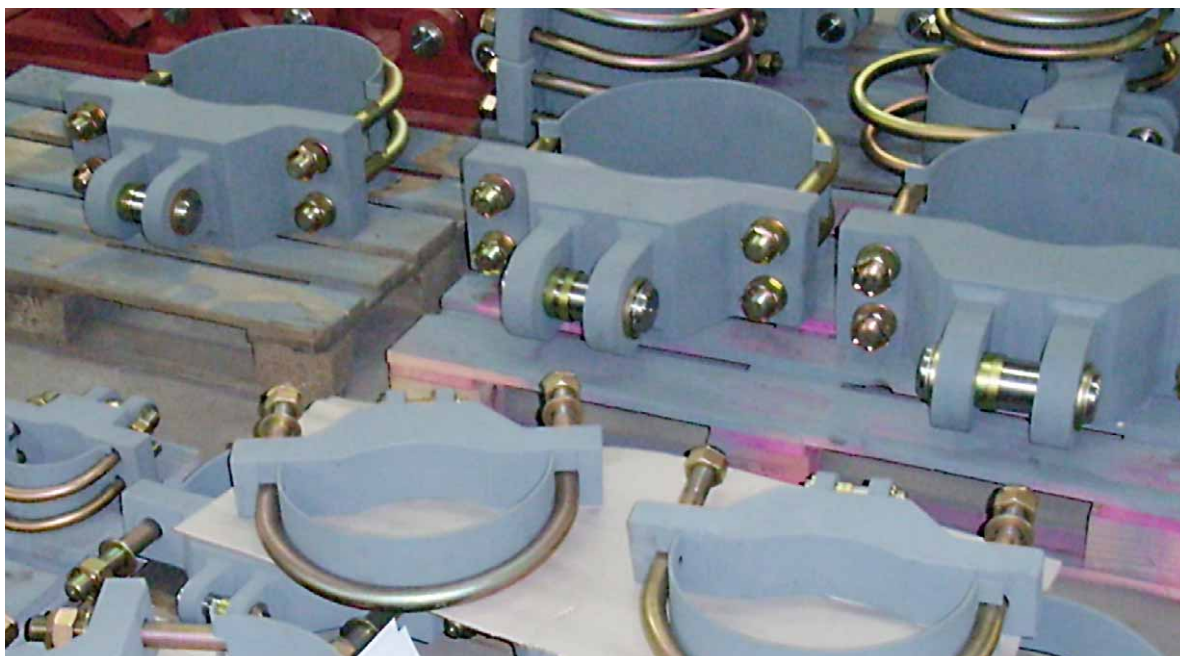
# Dynamic load clamps



## Installation dimensions and weight data sheet, EHS18

| Pipe Size |      | Pipe ØDA | ØG [mm] | B [mm] | EHS18S |        |        |        |        |        |        |        |        |        |        |        |
|-----------|------|----------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| inch      | mm   |          |         |        | Size 1 |        |        | Size 2 |        |        | Size 3 |        |        | Size 4 |        |        |
|           |      |          |         |        | E      | Insul* | Weight | E      | Insul* | Weight | E      | Insul* | Weight | E      | Insul* | Weight |
| 5         | 125  | 139,7    | 141     | 60     | 180    | 160    | 17     | –      | –      | –      | –      | –      | –      | –      | –      | –      |
| 6         | 150  | 168,3    | 170     | 60     | 205    | 185    | 19     | 235    | 210    | 34     | –      | –      | –      | –      | –      | –      |
| 8         | 200  | 219,1    | 222     | 60     | 225    | 205    | 22     | 255    | 230    | 42     | –      | –      | –      | –      | –      | –      |
| 10        | 250  | 273,0    | 276     | 90     | 265    | 245    | 26     | 300    | 275    | 45     | 325    | 290    | 64     | –      | –      | –      |
| 12        | 300  | 323,9    | 328     | 90     | 295    | 275    | 32     | 330    | 305    | 61     | 355    | 320    | 93     | 360    | 320    | 107    |
| 14        | 350  | 355,6    | 360     | 130    | 325    | 305    | 34     | 365    | 340    | 65     | 390    | 355    | 98     | 395    | 355    | 112    |
| 16        | 400  | 406,4    | 411     | 130    | 365    | 345    | 38     | 400    | 375    | 72     | 425    | 390    | 122    | 430    | 390    | 133    |
| 18        | 450  | 457,2    | 462     | 130    | 405    | 385    | 41     | 450    | 425    | 81     | 475    | 440    | 132    | 480    | 440    | 146    |
| 20        | 500  | 508,0    | 513     | 130    | 445    | 425    | 51     | 500    | 475    | 115    | 525    | 490    | 205    | 530    | 490    | 219    |
| 22        | 550  | 558,8    | 565     | 150    | 485    | 465    | 53     | 550    | 525    | 121    | 575    | 540    | 213    | 580    | 540    | 227    |
| 24        | 600  | 609,6    | 616     | 150    | 525    | 505    | 55     | 600    | 575    | 125    | 625    | 590    | 219    | 630    | 590    | 233    |
| 28        | 700  | 711,2    | 714     | 150    | 600    | 580    | 61     | 685    | 660    | 135    | 710    | 675    | 233    | 715    | 675    | 247    |
| 30        | 750  | 762,0    | 770     | a.A.   | 650    | 630    | 63     | 700    | 675    | 130    | 750    | 715    | 240    | 760    | 720    | 255    |
| 32        | 800  | 812,8    | 815     | a.A.   | 655    | 635    | 67     | 740    | 715    | 145    | 765    | 730    | 252    | 770    | 730    | 266    |
| 34        | 850  | 863,6    | 873     | a.A.   | 680    | 660    | 70     | 760    | 735    | 150    | 795    | 760    | 257    | 810    | 770    | 271    |
| 36        | 900  | 914,4    | 918     | a.A.   | 700    | 680    | 74     | 785    | 760    | 155    | 810    | 775    | 262    | 815    | 775    | 276    |
| 40        | 1000 | 1016,0   | 1019    | a.A.   | 880    | 860    | 93     | 950    | 925    | 165    | 980    | 945    | 275    | 1010   | 970    | 285    |
| 48        | 1200 | 1220,0   | 1233    | a.A.   | 980    | 960    | 112    | 1050   | 1025   | 175    | 1080   | 1045   | 286    | 1110   | 1070   | 315    |

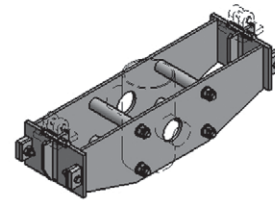
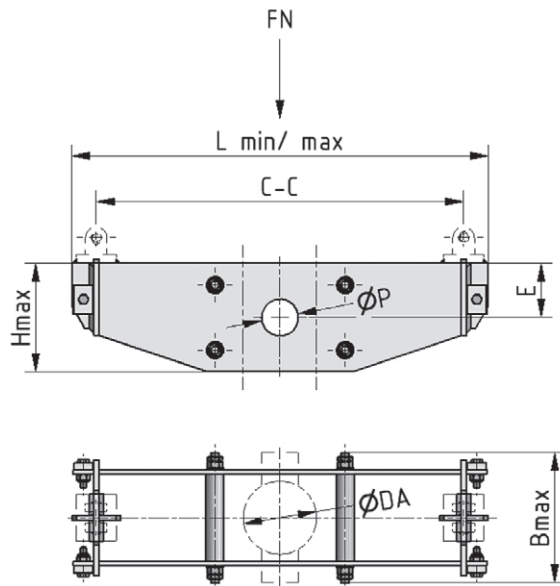
\* maximum insulation  
special clamp or special clamp materials on request



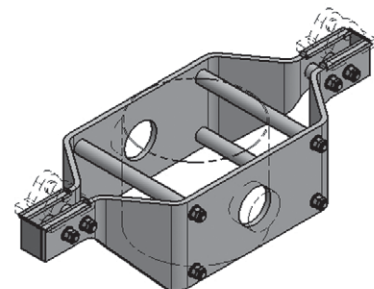
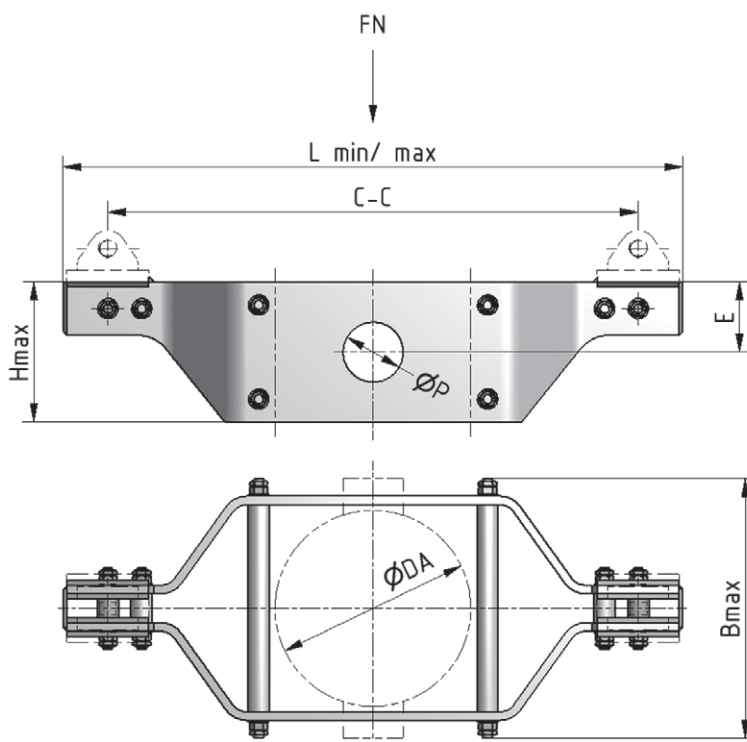
# Dynamic load clamps

## 5.4 Dynamic Vertical clamp, Fig. 403D

Design for Pipe size NW 50 to NW 250



Design for Pipe size NW 300 to NW 1000



# Dynamic load clamps



## Connecting dimensions data sheet, Fig. 403D

| Pipe size |      | Pipe ØDA | C-C  |        |      | ØP  | B max | H max | E1  |
|-----------|------|----------|------|--------|------|-----|-------|-------|-----|
| inch      | mm   |          | min  | middle | max  |     |       |       |     |
| mm        |      |          |      |        |      |     |       |       |     |
| 2         | 50   | 60,3     | 300  | 500    | 700  | 36  | 140   | 120   | 60  |
| 2,5       | 65   | 76,1     | 300  | 500    | 700  | 36  | 155   | 130   | 65  |
| 3         | 80   | 88,9     | 300  | 550    | 800  | 36  | 170   | 140   | 70  |
| 3,5       | 90   | 101,6    | 350  | 600    | 850  | 51  | 180   | 150   | 75  |
| 4         | 100  | 114,3    | 350  | 650    | 950  | 51  | 230   | 210   | 105 |
| 5         | 125  | 139,7    | 400  | 700    | 1000 | 51  | 260   | 220   | 110 |
| 6         | 150  | 168,3    | 450  | 775    | 1100 | 63  | 315   | 250   | 125 |
| 8         | 200  | 219,1    | 500  | 950    | 1400 | 79  | 400   | 310   | 155 |
| 10        | 250  | 273      | 550  | 975    | 1400 | 92  | 485   | 370   | 185 |
| 12        | 300  | 323,9    | 950  | 1150   | 1350 | 118 | 460   | 340   | 170 |
| 14        | 350  | 355,6    | 1000 | 1175   | 1350 | 118 | 505   | 370   | 185 |
| 16        | 400  | 406,4    | 1050 | 1200   | 1350 | 144 | 560   | 370   | 185 |
| 18        | 450  | 457,2    | 1200 | 1500   | 1800 | 144 | 645   | 460   | 230 |
| 20        | 500  | 508      | 1350 | 1575   | 1800 | 173 | 720   | 450   | 225 |
| 22        | 550  | 558,8    | 1450 | 1625   | 1800 | 173 | 770   | 490   | 245 |
| 24        | 600  | 609,6    | 1500 | 1750   | 2000 | 199 | 840   | 510   | 255 |
| 26        | 650  | 660,4    | 1600 | 1800   | 2000 | 224 | 890   | 530   | 265 |
| 28        | 700  | 711,2    | 1900 | 2200   | 2500 | 224 | 970   | 550   | 275 |
| 30        | 750  | 762      | 1900 | 2200   | 2500 | 250 | 1020  | 590   | 295 |
| 32        | 800  | 812,8    | 2200 | 2350   | 2500 | 250 | 1075  | 580   | 290 |
| 34        | 850  | 863,6    | 2300 | 2450   | 2600 | 250 | 1145  | 600   | 300 |
| 36        | 900  | 914,4    | 2400 | 2550   | 2700 | 279 | 1195  | 630   | 315 |
| 38        | 950  | 965      | 2600 | 2800   | 3000 | 279 | 1320  | 640   | 320 |
| 40        | 1000 | 1016     | 2600 | 2800   | 3000 | 279 | 1370  | 640   | 320 |

## Weight data sheet, Fig. 403D

| Pipe size |      | Pipe ØDA | Weight    |            |            |          |            |            | L min | L max |
|-----------|------|----------|-----------|------------|------------|----------|------------|------------|-------|-------|
| inch      | mm   |          | C-C min   |            | C-C middle |          | C-C max    |            |       |       |
| kg        |      |          |           |            |            |          |            |            |       |       |
| mm        |      |          |           |            |            |          |            |            |       |       |
| 2         | 50   | 60,3     | 5,2       |            | 7,4        |          | 10         |            | 370   | 770   |
| 2,5       | 65   | 76,1     | 5,5       |            | 7,9        |          | 10,7       |            | 370   | 770   |
| 3         | 80   | 88,9     | 6,9       |            | 10,5       |          | 14,5       |            | 370   | 870   |
| 3,5       | 90   | 101,6    | 7,7       |            | 11,8       |          | 16,1       |            | 420   | 920   |
| 4         | 100  | 114,3    | light 8,7 | heavy 18,6 | light 14,2 | heavy 33 | light 19,7 | heavy 47,8 | 450   | 1050  |
| 5         | 125  | 139,7    | 12,4      | 21,4       | 21         | 37,3     | 29,9       | 53,2       | 500   | 1100  |
| 6         | 150  | 168,3    | 15,3      | 37,5       | 23,8       | 58,1     | 33,5       | 82,4       | 570   | 1220  |
| 8         | 200  | 219,1    | 24,7      | 69,3       | 41,6       | 118,5    | 60,3       | 172,2      | 640   | 1540  |
| 10        | 250  | 273      | 32,2      | 103,4      | 51,7       | 177      | 72,8       | 252        | 730   | 1580  |
| 12        | 300  | 323,9    | 92,5      |            | 98,5       |          | 106,5      |            | 1130  | 1530  |
| 14        | 350  | 355,6    | 114       |            | 119        |          | 126        |            | 1180  | 1530  |
| 16        | 400  | 406,4    | 143,5     |            | 149,5      |          | 157,5      |            | 1230  | 1530  |
| 18        | 450  | 457,2    | 208,5     |            | 315,5      |          | 245,5      |            | 1380  | 1980  |
| 20        | 500  | 508      | 302       |            | 317        |          | 334        |            | 1530  | 1980  |
| 22        | 550  | 558,8    | 345,5     |            | 357,5      |          | 372,5      |            | 1630  | 1980  |
| 24        | 600  | 609,6    | 425       |            | 449        |          | 475        |            | 1680  | 2180  |
| 26        | 650  | 660,4    | 463,5     |            | 482,5      |          | 503,5      |            | 1780  | 2180  |
| 28        | 700  | 711,2    | 636       |            | 678        |          | 721        |            | 2080  | 2680  |
| 30        | 750  | 762      | 711,5     |            | 742,5      |          | 775,5      |            | 2320  | 2920  |
| 32        | 800  | 812,8    | 877       |            | 899        |          | 923        |            | 2620  | 2920  |
| 34        | 850  | 863,6    | 1012      |            | 1035       |          | 1058       |            | 2720  | 3020  |
| 36        | 900  | 914,4    | 1086      |            | 1110       |          | 1135       |            | 2820  | 3120  |
| 38        | 950  | 965      | 1351      |            | 1391       |          | 1433       |            | 3020  | 3420  |
| 40        | 1000 | 1016     | 1386      |            | 1425       |          | 1465       |            | 3020  | 3420  |

# Dynamic load clamps

## Load data sheet Dynamic Vertical clamp Figure 403D, Pipe size NW 50 to NW 150

| ØDA<br>mm | Pipe size |       | C-C<br>Min<br>Middle<br>Max | Allowable loads FN in kN |       |       |                |       |       |                    |       |       |                       |       |       |                     |       |       |                        |       |       |
|-----------|-----------|-------|-----------------------------|--------------------------|-------|-------|----------------|-------|-------|--------------------|-------|-------|-----------------------|-------|-------|---------------------|-------|-------|------------------------|-------|-------|
|           | mm        | inch  |                             | 80°C                     | 150°C | 300°C | 400°C          | 500°C | 540°C | 80°C               | 300°C | 550°C | 540°C                 | 540°C | 550°C | 540°C               | 560°C | 580°C | 560°C                  | 600°C | 650°C |
|           |           |       |                             | S355J2G3 (1.0570)        |       |       | 16Mo3 (1.5415) |       |       | 13CrMo4-5 (1.7335) |       |       | X6CrNiTi18 10(1.4541) |       |       | 10CrMo9-10 (1.7380) |       |       | X10CrMoVNb9-1 (1.4903) |       |       |
| 60,3      | 50        | 2     | 300                         | 47                       | 37    | 32    | 30             | 38    | 35    | 20                 | 35    | 27    | 23                    | 22    | 17    | 12                  | 54    | 46    | 16                     |       |       |
|           |           |       | 500                         | 40                       | 28    | 19    | 18             | 23    | 21    | 12                 | 21    | 16    | 14                    | 13    | 10    | 7                   | 32    | 28    | 10                     |       |       |
| 76,1      | 65        | 2 1/2 | 700                         | 29                       | 20    | 16    | 14             | 16    | 15    | 9                  | 15    | 12    | 10                    | 10    | 7     | 23                  | 20    | 7     |                        |       |       |
|           |           |       | 300                         | 80                       | 56    | 44    | 38             | 35    | 41    | 24                 | 42    | 33    | 28                    | 27    | 20    | 14                  | 64    | 55    | 19                     |       |       |
| 88,9      | 80        | 3     | 500                         | 48                       | 34    | 26    | 23             | 27    | 25    | 14                 | 25    | 20    | 17                    | 16    | 12    | 8                   | 38    | 33    | 12                     |       |       |
|           |           |       | 700                         | 34                       | 24    | 19    | 16             | 15    | 19    | 18                 | 10    | 18    | 14                    | 12    | 11    | 8                   | 27    | 24    | 8                      |       |       |
| 101,6     | 90        | 3 1/2 | 300                         | 113                      | 79    | 62    | 54             | 50    | 63    | 58                 | 34    | 59    | 46                    | 39    | 38    | 20                  | 90    | 78    | 27                     |       |       |
|           |           |       | 550                         | 62                       | 43    | 34    | 29             | 27    | 35    | 32                 | 18    | 32    | 25                    | 21    | 21    | 15                  | 49    | 42    | 15                     |       |       |
| 114,3     | 100       | 4     | 800                         | 42                       | 30    | 23    | 20             | 19    | 24    | 22                 | 13    | 22    | 17                    | 15    | 14    | 10                  | 34    | 29    | 10                     |       |       |
|           |           |       | 350                         | 105                      | 73    | 58    | 50             | 46    | 59    | 54                 | 31    | 55    | 43                    | 36    | 35    | 26                  | 18    | 84    | 72                     | 25    |       |
| 139,7     | 125       | 5     | 600                         | 61                       | 43    | 34    | 29             | 27    | 34    | 31                 | 18    | 32    | 25                    | 21    | 20    | 15                  | 49    | 42    | 15                     |       |       |
|           |           |       | 850                         | 43                       | 30    | 24    | 21             | 19    | 24    | 22                 | 13    | 23    | 18                    | 15    | 14    | 11                  | 7     | 35    | 30                     | 10    |       |
| 168,3     | 150       | 6     | 350                         | 122                      | 85    | 67    | 58             | 54    | 68    | 62                 | 36    | 64    | 49                    | 42    | 40    | 30                  | 21    | 97    | 83                     | 29    |       |
|           |           |       | 650                         | 65                       | 46    | 36    | 31             | 29    | 37    | 34                 | 20    | 34    | 27                    | 22    | 22    | 16                  | 11    | 52    | 45                     | 16    |       |
| 180       | 180       | 64    | 950                         | 45                       | 31    | 25    | 21             | 20    | 25    | 23                 | 13    | 24    | 18                    | 15    | 15    | 11                  | 8     | 36    | 31                     | 11    |       |
|           |           |       | 350                         | 163                      | 129   | 102   | 88             | 82    | 104   | 95                 | 55    | 86    | 75                    | 64    | 62    | 46                  | 32    | 148   | 127                    | 45    |       |
| 210       | 210       | 69    | 650                         | 100                      | 70    | 55    | 47             | 44    | 56    | 51                 | 30    | 53    | 41                    | 34    | 33    | 25                  | 17    | 80    | 69                     | 24    |       |
|           |           |       | 950                         | 68                       | 48    | 37    | 32             | 30    | 38    | 35                 | 20    | 36    | 28                    | 23    | 23    | 17                  | 12    | 55    | 47                     | 17    |       |
| 256       | 256       | 90    | 350                         | 245                      | 245   | 241   | 188            | 188   | 185   | 185                | 131   | 129   | 129                   | 129   | 146   | 108                 | 76    | 291   | 291                    | 106   |       |
|           |           |       | 650                         | 236                      | 165   | 130   | 112            | 104   | 133   | 121                | 70    | 124   | 96                    | 81    | 79    | 58                  | 41    | 189   | 162                    | 57    |       |
| 298       | 298       | 111   | 950                         | 162                      | 113   | 89    | 77             | 71    | 91    | 83                 | 48    | 85    | 66                    | 55    | 54    | 40                  | 28    | 129   | 111                    | 39    |       |
|           |           |       | 400                         | 162                      | 113   | 89    | 77             | 71    | 91    | 83                 | 48    | 85    | 66                    | 56    | 56    | 40                  | 28    | 130   | 111                    | 39    |       |
| 322       | 322       | 134   | 700                         | 93                       | 65    | 51    | 44             | 41    | 52    | 48                 | 28    | 49    | 38                    | 32    | 31    | 23                  | 16    | 74    | 64                     | 22    |       |
|           |           |       | 1000                        | 65                       | 45    | 36    | 31             | 29    | 36    | 33                 | 19    | 34    | 26                    | 22    | 22    | 16                  | 11    | 52    | 45                     | 16    |       |
| 38        | 38        | 107   | 400                         | 245                      | 245   | 232   | 188            | 187   | 185   | 185                | 126   | 129   | 129                   | 129   | 141   | 104                 | 73    | 291   | 291                    | 103   |       |
|           |           |       | 700                         | 242                      | 169   | 133   | 115            | 107   | 136   | 124                | 72    | 127   | 98                    | 83    | 81    | 60                  | 42    | 194   | 166                    | 59    |       |
| 441       | 441       | 155   | 1000                        | 169                      | 118   | 93    | 81             | 75    | 95    | 87                 | 51    | 89    | 69                    | 58    | 56    | 42                  | 29    | 136   | 116                    | 41    |       |
|           |           |       | 450                         | 156                      | 109   | 86    | 74             | 69    | 88    | 80                 | 47    | 82    | 63                    | 53    | 52    | 38                  | 27    | 125   | 107                    | 38    |       |
| 469       | 469       | 113   | 775                         | 90                       | 63    | 50    | 43             | 40    | 51    | 46                 | 27    | 48    | 37                    | 31    | 30    | 22                  | 16    | 72    | 62                     | 22    |       |
|           |           |       | 1100                        | 64                       | 44    | 35    | 30             | 28    | 36    | 33                 | 19    | 34    | 26                    | 22    | 21    | 16                  | 11    | 51    | 44                     | 15    |       |
| 490       | 490       | 180   | 450                         | 302                      | 280   | 221   | 191            | 177   | 226   | 206                | 120   | 159   | 138                   | 134   | 99    | 70                  | 322   | 276   | 97                     |       |       |
|           |           |       | 775                         | 234                      | 163   | 128   | 111            | 103   | 131   | 120                | 70    | 123   | 95                    | 80    | 78    | 58                  | 40    | 187   | 160                    | 57    |       |
| 55        | 55        | 132   | 1100                        | 165                      | 115   | 90    | 78             | 72    | 93    | 84                 | 49    | 87    | 67                    | 56    | 55    | 41                  | 28    | 132   | 113                    | 40    |       |
|           |           |       | 450                         | 395                      | 395   | 352   | 302            | 283   | 298   | 298                | 191   | 208   | 208                   | 208   | 214   | 158                 | 111   | 469   | 441                    | 155   |       |
| 64        | 64        | 180   | 775                         | 372                      | 260   | 204   | 177            | 164   | 209   | 191                | 111   | 196   | 152                   | 128   | 124   | 64                  | 298   | 256   | 90                     |       |       |
|           |           |       | 1100                        | 262                      | 183   | 144   | 125            | 116   | 148   | 135                | 78    | 138   | 107                   | 90    | 87    | 65                  | 45    | 210   | 180                    | 64    |       |

# Dynamic load clamps



Load data sheet for Dynamic Vertical clamp Figure 403D, Pipe size NW 200 to NW 250

| ØDA   | Pipe size |      | C-C                    | Allowable loads FN in KN |      |       |       |       |       |       |      |       |       |       |       |       |       |       |       |     |     |
|-------|-----------|------|------------------------|--------------------------|------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|
|       | mm        | inch |                        | Min                      | 80°C | 150°C | 300°C | 400°C | 500°C | 540°C | 80°C | 300°C | 550°C | 540°C | 560°C | 580°C | 560°C | 600°C | 650°C |     |     |
| 219,1 | 200       | 8    | S355J2G3 (1.0570)      | 500                      | 208  | 145   | 114   | 99    | 92    | 117   | 107  | 62    | 109   | 85    | 71    | 69    | 51    | 36    | 166   | 143 | 50  |
|       |           |      |                        | Middle                   | 950  | 109   | 76    | 60    | 52    | 62    | 56   | 33    | 58    | 45    | 38    | 36    | 27    | 19    | 88    | 75  | 27  |
|       |           |      |                        | Max                      | 1400 | 74    | 52    | 41    | 35    | 42    | 38   | 22    | 39    | 30    | 25    | 25    | 18    | 13    | 59    | 51  | 18  |
|       |           |      | X10CrMoVNb9-1 (1.4903) | 500                      | 368  | 344   | 271   | 234   | 217   | 253   | 147  | 194   | 169   | 164   | 122   | 85    | 394   | 339   | 119   |     |     |
|       |           |      |                        | 950                      | 260  | 181   | 142   | 123   | 114   | 146   | 133  | 77    | 137   | 106   | 89    | 86    | 64    | 45    | 208   | 178 | 63  |
|       |           |      |                        | 1400                     | 176  | 123   | 97    | 84    | 78    | 99    | 90   | 53    | 93    | 72    | 60    | 59    | 43    | 30    | 141   | 121 | 43  |
|       |           |      |                        | 500                      | 490  | 490   | 422   | 365   | 338   | 369   | 369  | 229   | 258   | 258   | 258   | 256   | 189   | 133   | 583   | 527 | 186 |
|       |           |      |                        | 950                      | 404  | 282   | 222   | 192   | 178   | 227   | 207  | 121   | 213   | 164   | 139   | 135   | 100   | 70    | 323   | 278 | 98  |
|       |           |      |                        | 1400                     | 274  | 191   | 151   | 130   | 121   | 154   | 141  | 82    | 144   | 112   | 94    | 91    | 68    | 47    | 219   | 188 | 66  |
|       |           |      |                        | 500                      | 613  | 613   | 608   | 469   | 469   | 462   | 462  | 331   | 323   | 323   | 323   | 323   | 369   | 273   | 728   | 728 | 268 |
|       |           |      |                        | 950                      | 583  | 407   | 320   | 277   | 257   | 328   | 299  | 174   | 307   | 237   | 200   | 194   | 144   | 101   | 466   | 401 | 141 |
|       |           |      |                        | 1400                     | 396  | 276   | 217   | 188   | 174   | 222   | 203  | 118   | 208   | 161   | 136   | 132   | 98    | 68    | 317   | 272 | 96  |
| 273,0 | 250       | 10   | 16Mo3 (1.5415)         | 550                      | 242  | 169   | 133   | 115   | 107   | 136   | 124  | 72    | 128   | 99    | 83    | 81    | 60    | 194   | 166   | 59  |     |
|       |           |      |                        | 975                      | 137  | 95    | 75    | 65    | 60    | 77    | 70   | 41    | 72    | 56    | 47    | 46    | 34    | 24    | 109   | 94  | 33  |
|       |           |      |                        | 1400                     | 95   | 66    | 52    | 45    | 42    | 54    | 49   | 28    | 50    | 39    | 33    | 32    | 23    | 16    | 76    | 65  | 23  |
|       |           |      | 10CrMo9-10 (1.7380)    | 550                      | 429  | 411   | 324   | 280   | 260   | 323   | 302  | 176   | 226   | 226   | 202   | 196   | 145   | 102   | 471   | 405 | 143 |
|       |           |      |                        | 975                      | 332  | 232   | 182   | 158   | 146   | 187   | 171  | 99    | 175   | 135   | 114   | 111   | 82    | 58    | 266   | 228 | 81  |
|       |           |      |                        | 1400                     | 232  | 161   | 127   | 110   | 102   | 130   | 119  | 69    | 122   | 94    | 79    | 77    | 57    | 40    | 185   | 159 | 56  |
|       |           |      |                        | 550                      | 572  | 572   | 494   | 428   | 397   | 431   | 431  | 269   | 301   | 301   | 301   | 300   | 222   | 156   | 680   | 619 | 218 |
|       |           |      |                        | 975                      | 508  | 354   | 279   | 241   | 224   | 286   | 261  | 152   | 267   | 207   | 174   | 169   | 125   | 88    | 406   | 349 | 123 |
|       |           |      |                        | 1400                     | 354  | 247   | 194   | 168   | 156   | 199   | 181  | 106   | 186   | 144   | 121   | 118   | 87    | 61    | 283   | 243 | 86  |
|       |           |      |                        | 550                      | 715  | 715   | 702   | 547   | 547   | 539   | 539  | 382   | 376   | 376   | 376   | 426   | 315   | 221   | 850   | 850 | 310 |
|       |           |      |                        | 975                      | 715  | 503   | 396   | 343   | 318   | 405   | 370  | 215   | 376   | 293   | 247   | 240   | 178   | 125   | 577   | 495 | 175 |
|       |           |      |                        | 1400                     | 502  | 350   | 276   | 239   | 221   | 282   | 258  | 150   | 264   | 204   | 172   | 167   | 124   | 87    | 402   | 345 | 122 |
| 550   | 786       | 786  | 786                    | 602                      | 602  | 593   | 593   | 473   | 414   | 414   | 414  | 527   | 390   | 274   | 934   | 934   | 384   |       |       |     |     |
| 975   | 786       | 623  | 490                    | 425                      | 394  | 502   | 458   | 267   | 414   | 363   | 307  | 298   | 220   | 155   | 580   | 614   | 216   |       |       |     |     |
| 1400  | 622       | 434  | 341                    | 296                      | 274  | 350   | 319   | 186   | 327   | 253   | 213  | 207   | 153   | 108   | 498   | 427   | 151   |       |       |     |     |

Higher loads or special materials on request

# Dynamic load clamps

Load data sheet for Dynamic Vertical clamp Figure 403D, Pipe size NW 300 to NW 750

| Version  | ØDA<br>mm | Pipe size |      | C-C<br>max<br>mm | Allowable loads kN |                |                    |                        |                     |                        |      |       |       |       |       |       |       |       |       |  |
|----------|-----------|-----------|------|------------------|--------------------|----------------|--------------------|------------------------|---------------------|------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|          |           | mm        | inch |                  | 80°C               | 150°C          | 300°C              | 400°C                  | 500°C               | 540°C                  | 80°C | 300°C | 550°C | 540°C | 560°C | 580°C | 560°C | 600°C | 640°C |  |
| Material |           |           |      |                  | S355J2G3 (1.0570)  | 16Mo3 (1.5415) | 13CrMo4-5 (1.7335) | X6CrNiTi18 10 (1.4541) | 10CrMo9-10 (1.7380) | X10CrMoVNb9-1 (1.4903) |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 76                 | 54             | 42                 | 40                     | 23                  | 26                     | 26   | 19    | 13    | 62    | 53    | 21    |       |       |       |  |
| M        | 323,9     |           | 12   | 1350             | 101                |                | 76                 | 57                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 300       |      |                  | 134                |                | 101                | 83                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 64                 | 54             | 42                 | 40                     | 23                  | 26                     | 26   | 19    | 13    | 62    | 53    | 21    |       |       |       |  |
| M        | 355,6     |           | 14   | 1350             | 96                 |                | 72                 | 62                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 350       |      |                  | 123                |                | 92                 |                        |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 64                 | 50             | 40                 | 40                     | 21                  | 25                     | 24   | 18    | 12    | 58    | 50    | 20    |       |       |       |  |
| M        | 406,4     |           | 16   | 1350             | 105                |                | 79                 | 72                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 400       |      |                  | 200                |                | 151                | 126                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 87                 | 82             | 64                 | 60                     | 35                  | 40                     | 39   | 29    | 20    | 94    | 80    | 32    |       |       |       |  |
| M        | 457,2     |           | 18   | 1800             | 167                |                | 126                | 95                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 450       |      |                  | 229                |                | 172                | 156                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 75                 | 75             | 60                 | 56                     | 33                  | 37                     | 37   | 27    | 19    | 88    | 75    | 30    |       |       |       |  |
| M        | 508,0     |           | 20   | 1800             | 161                |                | 121                | 106                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 500       |      |                  | 296                |                | 223                | 176                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 74                 |                | 56                 | 40                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| M        | 558,8     |           | 22   | 1800             | 191                |                | 144                | 126                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 550       |      |                  | 336                |                | 253                | 214                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 60                 |                | 45                 | 38                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| M        | 609,6     |           | 24   | 2000             | 209                |                | 157                | 149                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 600       |      |                  | 377                |                | 284                | 253                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 100                | 100            | 88                 | 75                     | 48                  | 52                     | 53   | 39    | 27    | 119   | 110   | 44    |       |       |       |  |
| M        | 660,4     |           | 26   | 2000             | 226                |                | 170                | 157                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 650       |      |                  | 398                |                | 300                | 265                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 93                 |                | 70                 | 46                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| M        | 711,2     |           | 28   | 2500             | 281                |                | 212                | 165                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 700       |      |                  | 463                |                | 348                | 278                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| L        |           |           |      |                  | 101                |                | 76                 | 57                     |                     |                        |      |       |       |       |       |       |       |       |       |  |
| M        | 762,0     |           | 30   | 2500             | 302                |                | 227                | 191                    |                     |                        |      |       |       |       |       |       |       |       |       |  |
| S        |           | 750       |      |                  | 491                |                | 370                | 315                    |                     |                        |      |       |       |       |       |       |       |       |       |  |

all loads at C-C max

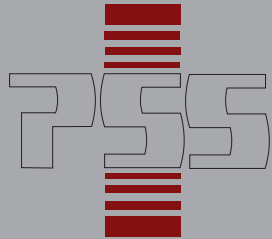
# Dynamic load clamps



Load data sheet for Dynamic Vertical clamp Figure 403D, Pipe size NW 800 to NW 1200

| Version  | ØDA    | Pipe size |      | C-C max | Allowable loads kN |       |                |                    |       |                       |       |                     |       |                        |       |       |       |       |       |
|----------|--------|-----------|------|---------|--------------------|-------|----------------|--------------------|-------|-----------------------|-------|---------------------|-------|------------------------|-------|-------|-------|-------|-------|
|          |        | mm        | inch |         | mm                 | 80°C  | 150°C          | 300°C              | 400°C | 500°C                 | 540°C | 80°C                | 300°C | 550°C                  | 540°C | 560°C | 580°C | 560°C | 600°C |
| Temp. °C | mm     | mm        | inch | mm      | 80°C               | 150°C | 300°C          | 400°C              | 500°C | 540°C                 | 80°C  | 300°C               | 550°C | 540°C                  | 560°C | 580°C | 560°C | 600°C | 640°C |
| Material |        |           |      |         | S355J2G3 (1.0570)  |       | 16Mo3 (1.5415) | 13CrMo4-5 (1.7335) |       | X6CrNiTi18 10(1.4541) |       | 10CrMo9-10 (1.7380) |       | X10CrMoVNb9-1 (1.4903) |       |       |       |       |       |
| L        |        |           |      |         | 127                | 97    | 96             | 71                 | 67    | 80                    | 59    | 41                  | 151   | 66                     |       |       |       |       |       |
| M        | 812,8  | 800       | 32   | 2500    | 343                | 262   | 258            | 207                | 180   | 230                   | 171   | 120                 | 407   | 192                    |       |       |       |       |       |
| S        |        |           |      |         | 541                | 414   | 408            | 352                | 285   | 393                   | 291   | 204                 | 643   | 327                    |       |       |       |       |       |
| L        |        |           |      |         | 126                | 97    | 96             | 69                 | 67    | 76                    | 57    | 40                  | 151   | 64                     |       |       |       |       |       |
| M        | 863,5  | 850       | 34   | 2600    | 343                | 262   | 258            | 220                | 180   | 246                   | 182   | 127                 | 407   | 204                    |       |       |       |       |       |
| S        |        |           |      |         | 541                | 414   | 408            | 368                | 285   | 411                   | 304   | 213                 | 643   | 341                    |       |       |       |       |       |
| L        |        |           |      |         | 127                | 97    | 96             | 77                 | 67    | 86                    | 64    | 45                  | 151   | 72                     |       |       |       |       |       |
| M        | 914,4  | 900       | 36   | 2700    | 368                | 275   | 277            | 229                | 193   | 256                   | 189   | 133                 | 407   | 212                    |       |       |       |       |       |
| S        |        |           |      |         | 575                | 440   | 433            | 380                | 302   | 424                   | 314   | 220                 | 683   | 352                    |       |       |       |       |       |
| L        |        |           |      |         | 300                | 230   | 220            | 160                | 155   | 180                   | 135   | 97                  | 355   | 155                    |       |       |       |       |       |
| M        | 965,0  | 950       | 38   | 3000    | 470                | 360   | 350            | 270                | 245   | 300                   | 225   | 160                 | 560   | 255                    |       |       |       |       |       |
| S        |        |           |      |         | 650                | 500   | 490            | 400                | 345   | 450                   | 335   | 235                 | 780   | 375                    |       |       |       |       |       |
| L        |        |           |      |         | 340                | 260   | 255            | 225                | 175   | 250                   | 185   | 130                 | 400   | 210                    |       |       |       |       |       |
| M        | 1016,0 | 1000      | 40   | 3000    | 495                | 380   | 375            | 315                | 260   | 350                   | 260   | 180                 | 590   | 290                    |       |       |       |       |       |
| S        |        |           |      |         | 655                | 500   | 495            | 405                | 345   | 450                   | 335   | 235                 | 780   | 375                    |       |       |       |       |       |

all loads at C-C max  
Higher loads or special materials on request



## Pipe Support Systems GmbH International



PSS Pipe Support Systems GmbH International  
Geßbachstr. 2, D-66538 Neunkirchen

Postanschrift:

Postfach 1142, D-66511 Neunkirchen

Tel. 0049 (0)6821 - 4011 - 0

Fax 0049 (0)6821 - 4011 - 37

[www.pipesupp.de](http://www.pipesupp.de)

[info@pipesupp.de](mailto:info@pipesupp.de)

**... wir unterstützen Sie**  
**... we support you**