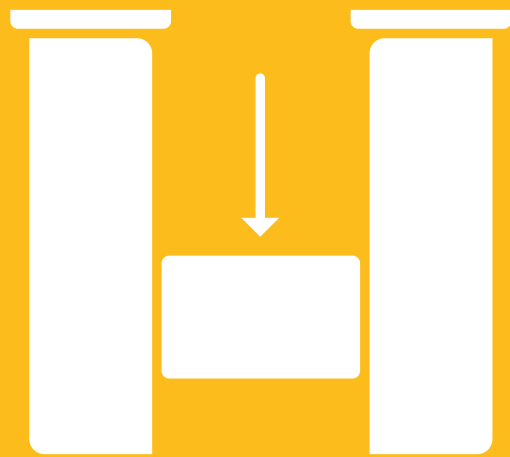


**sikla**



**Simotec**  
Static Guideline



|                                |                |
|--------------------------------|----------------|
| <b>Notes</b>                   | <b>2</b>       |
| <b>siFramo</b>                 | <b>3 - 4</b>   |
| <b>siFramo 80/30</b>           | <b>5 - 8</b>   |
| <b>siFramo 80</b>              | <b>9 - 16</b>  |
| <b>siFramo 100</b>             | <b>17 - 24</b> |
| <b>siFramo 100/160</b>         | <b>25 - 34</b> |
| <b>siFramo 100/160 combi</b>   | <b>35 - 37</b> |
| <b>Structural Elements</b>     | <b>38</b>      |
| <b>Structural Elements 100</b> | <b>39 - 41</b> |
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| <b>Supports (Pipe Shoes)</b>   | <b>45 - 63</b> |
| <b>U-Bolt Supports</b>         | <b>64 - 65</b> |
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### Application

Sikla „Installation Guidelines“ is intended to provide guidance for supporting constructions within industrial pipework and plant engineering consisting of the Sikla Systems siFramo 80, siFramo 100, Beam System 100 and Beam System 120.

All CE marked systems are subject to the certified factory production control according to EN 1090 and may therefore be used to EXC 2 for load-bearing structures.

### Basis of calculation

Eurocode 3 (DIN EN 1993) „Design of steel structures“ provides the basis for determining the load capacity. Regarding serviceability the specified restrictions are allocated separately according to the design of the individual constructions. These limits may also be specified differently by the client. All deformations are determined on the basis of characteristic loads ( $\gamma_F = 1.0$ ). The values of the permissible loads comply simultaneously the ultimate limit state and the serviceability limit state design. The respective governing load is listed as  $F_{z, perm}$  in the Installation Guideline.

### Load effects

Specified are permissible vertical loads  $F_{z, perm}$  in kN (e.g. pipeline weights), which have to be understood as maximum values of characteristic load effects and consider a safety factor  $\gamma_F = 1.35$ .

Some Sikla constructions take into account additional friction forces  $F_x = F_z \cdot \mu_0$  for Sikla Pipe Shoes based on hot-dipped galvanized surface of Sikla beams which are calculated from pipe weight  $F_z$  and a friction coefficient  $\mu_0 = 0.2$ . These variable forces from pipe expansion are taken into account with a safety factor  $\gamma_F = 1.5$ . Sliding or guided Pipe Shoes (Sikla slide elements) with a higher coefficient  $\mu_0 > 0.2$  (e.g. steel on steel) require an individual calculation.

### Conditions

All loads are static loads at room temperature unless stated otherwise. Technical notes of the respective product data sheets for use and application range must be observed.

### Load transmission into building structure

When fixing by anchors, or connection to existing cast-in channels, the structural safety analysis for the components used for this purpose must be done separately. When connecting to existing steel structures on site, resilience, support and torsional rigidity of the existing structure must be checked separately. In addition, when connecting with clamping sets, the static friction between clamping set and the on-site steel structure must fulfill the condition  $\mu_0 \geq 0.2$  (Sliding Surfaces Class D). On-site steel structure sizes (flange widths) of  $\geq 100$  mm are considered by using clamps for connection points.

Unless shown otherwise: force direction  $F_x =$  steel structure longitudinal axis.

Connections to concrete are designed with anchor type VMZ-A M12 (ETA-10/0260) in concrete strength C20/C25 under the design specifications  $h_{std} \geq 2 h_{ef}$  edge distance  $c \geq 120$  mm. Axis distances are determined by the components.

Reduction factor  $\alpha_A = 0.7$  for structural steel flange sizes  $\geq 201$  mm for End Support WBD F80, F100 and F100/160.

### Technical Information

Installation conditions are summarized at the end of this brochure - in particular specifications regarding tightening torques, bolt spacing, general installation instructions etc.

### Recycleability of Products

Products must only be re-used if the recommended working loads have not been previously exceeded and if the coating has not been discernibly damaged.

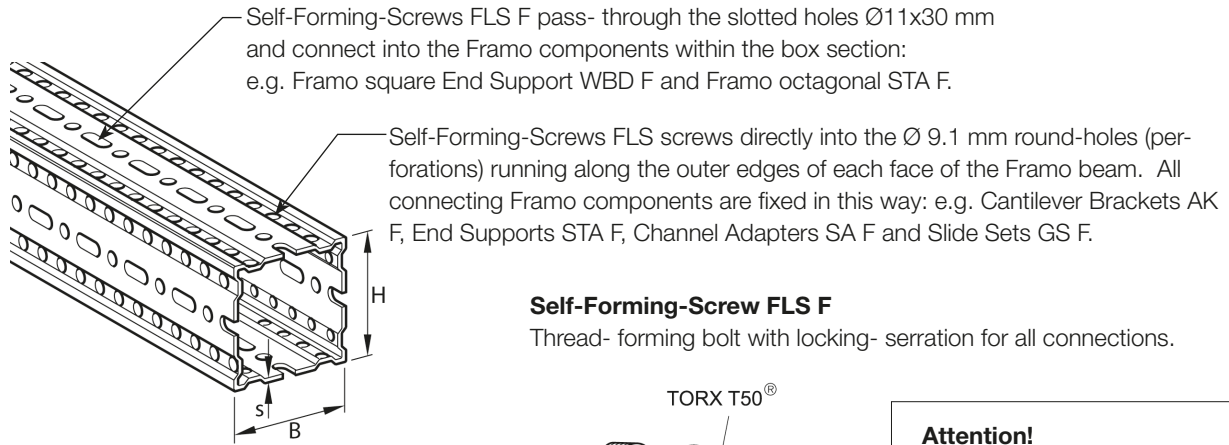
### General Remarks/ Disclaimer

This document is solely for being used by the receiver but remains property of Sikla. The technical drawings and all other content are to the best of our knowledge. Pictures and illustrations are non-committing. We can not be held responsible for printing errors and their implications. We reserve the right of making alterations and improvements without notice.

The present Guideline allows the user to select and to design supporting structures (constructions) easily. This document has been prepared in close cooperation with the following external specialists.

### siFramo

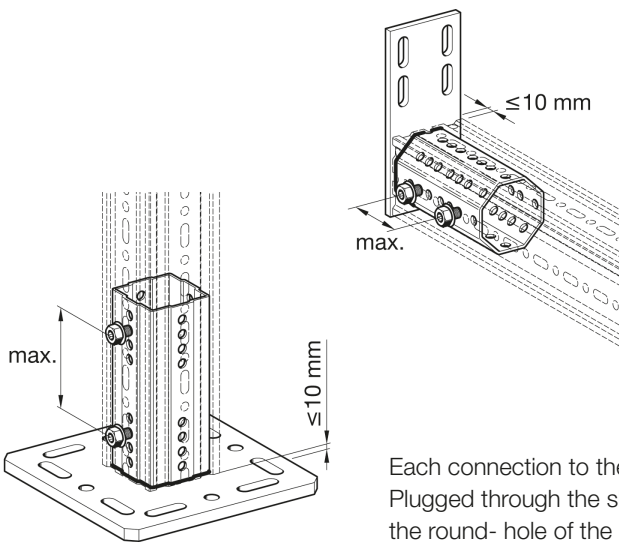
#### Beam Section TP F 80 and TP F 100



**Attention!**  
▶ Max. applied torque no more than 60 Nm !

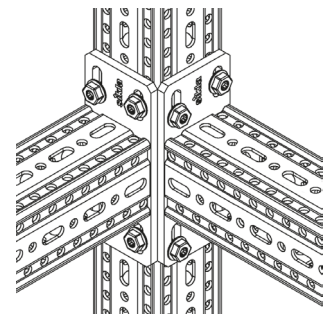
#### Assembly of Beam Section TP F with WBD-End Support and End Support STA F

For best performance the Self-Forming-Screw FLS F must be applied to both sides in greatest possible distance apart 2 x 2 screws opposite one another.  
Distance between end of section and end-plate: ≤ 10 mm.

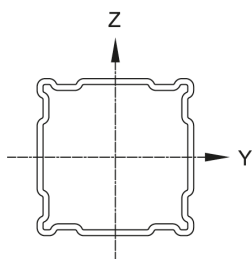


#### Assembly to Beam Section TP F, e.g. Cantilever Bracket AK F

Offset hole-lines allow for connection at one level without collision of bolts inside the box section for all components with end-plate (e.g. STA F, SA F).  
4 Self-Forming-Screws are required to fix each end-plate!



#### Technical Data



| Description<br>Beam Section<br>[mm] | Description<br>Axis | Wand-<br>dicke<br>s<br>[mm] | Moment of Inertia                    |                                      | Section<br>Modulus                   |                                      | Radius of<br>Inertia   |                        | Torsional<br>Moment<br>It<br>[cm <sup>4</sup> ] | Cross<br>Section<br>A<br>[cm <sup>2</sup> ] | Weight<br>G<br>[kg/m] |
|-------------------------------------|---------------------|-----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|------------------------|------------------------|-------------------------------------------------|---------------------------------------------|-----------------------|
|                                     |                     |                             | I <sub>y</sub><br>[cm <sup>4</sup> ] | I <sub>z</sub><br>[cm <sup>4</sup> ] | W <sub>y</sub><br>[cm <sup>3</sup> ] | W <sub>z</sub><br>[cm <sup>3</sup> ] | i <sub>y</sub><br>[cm] | i <sub>z</sub><br>[cm] |                                                 |                                             |                       |
| TP F 80/30                          |                     | 3,0                         | 35,4 <sup>*)</sup>                   | 6,7 <sup>*)</sup>                    | 10,3 <sup>*)</sup>                   | 4,7 <sup>*)</sup>                    | 3,63                   | 1,58                   | 8,58                                            | 2,69 <sup>*)</sup>                          | 4,3                   |
| TP F 80/80                          |                     | 3,0                         | 62,5 <sup>*)</sup>                   |                                      | 15,8 <sup>*)</sup>                   |                                      | 3,58                   |                        | 48,40 <sup>*)</sup>                             | 4,85                                        | 6,4                   |
| TP F 100/100                        |                     | 4,0                         | 179,8 <sup>*)</sup>                  |                                      | 36,9 <sup>*)</sup>                   |                                      | 4,80                   |                        | 135,00                                          | 7,80 <sup>*)</sup>                          | 10,8                  |
| TP F 100/160                        |                     | 4,0                         | 559,4 <sup>*)</sup>                  | 280,3 <sup>*)</sup>                  | 75,5 <sup>*)</sup>                   | 46,2 <sup>*)</sup>                   | 6,16                   | 4,36                   | 193,00                                          | 14,74 <sup>*)</sup>                         | 14,3                  |

Beam Section TP F. Steel. Hot-dipped-galvanized according to DIN EN ISO 1461 tZn o.  
All structural data takes perforation into account.  
) determination of effective values by tests.

### Connection to primary steel structure by Assembly Set P2 S and P3 S

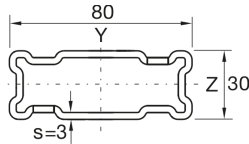
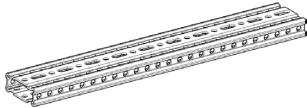
The image illustrates the connection of the siFramo system to a primary steel structure. It features a photograph of the installed system in a large industrial facility, showing white pipes and a steel ceiling. Below the photograph are several technical drawings: a perspective view of the assembly set connecting a secondary beam to a primary steel beam, a side view showing the connection to a vertical post, and a detailed close-up of the assembly set being inserted into a slotted hole. The close-up shows the main axis of the structural beam (x) and the 90-degree direction to the main axis (y).

| Description              | Thread | Tightening torque [Nm] |
|--------------------------|--------|------------------------|
| Assembly Set MS 5P M12 S | M12    | 85                     |
| Assembly Set MS 5P M16 S | M16    | 150                    |

Use Assembly Set always into slotted hole rows (y) in 90° direction to the main axis of the structural beam (x).

### Working loads in accordance with Eurocode 3

#### Beam Section TP F 80/30



Single-span beam with uniaxial load  
dead weight of the profile is considered

| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
|------------------|-----------|---------------|-----------------|
|                  | [mm]      | [kN/m]        | [kN]            |
|                  | 500       | <b>27,80</b>  | <b>13,90</b>    |
|                  | 1000      | <b>5,44</b>   | <b>5,44</b>     |
|                  | 1500      | <b>1,61</b>   | <b>2,42</b>     |
|                  | 2000      | <b>0,68</b>   | <b>1,36</b>     |
|                  | 2500      | <b>0,35</b>   | <b>0,87</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | $F_{z, perm}$ |
|------------|-----------|---------------|
|            | [mm]      | [kN]          |
|            | 500       | <b>9,13</b>   |
|            | 1000      | <b>3,40</b>   |
|            | 1500      | <b>1,51</b>   |
|            | 2000      | <b>0,85</b>   |
|            | 2500      | <b>0,54</b>   |

$F_z$  [kN] as a permanent load at L/2.

| 2 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [kN]          |
|               | 500       | <b>6,85</b>   |
|               | 1000      | <b>1,99</b>   |
|               | 1500      | <b>0,89</b>   |
|               | 2000      | <b>0,50</b>   |
|               | 2500      | <b>0,32</b>   |

$F_z$  [kN] as permanent loads at L/3 and 2\*L/3.

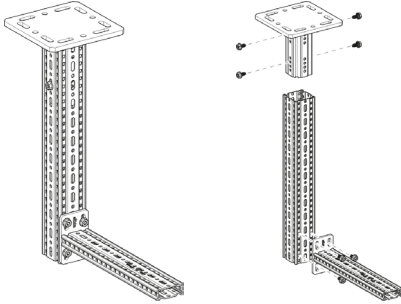
| 3 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [kN]          |
|               | 500       | <b>4,56</b>   |
|               | 1000      | <b>1,43</b>   |
|               | 1500      | <b>0,64</b>   |
|               | 2000      | <b>0,36</b>   |
|               | 2500      | <b>0,23</b>   |

$F_z$  [kN] as permanent loads at L/4, L/2 and 3\*L/4.

Max. bending L/200.

## Working loads in accordance with Eurocode 3

### L-Construction F 80 - 80/30



#### Part List

- 1 x End Support WBD F 80
- 1 x Beam Section TP F 80
- 1 x Cantilever Bracket AK F 80/30
- 8 x Self-Forming-Screw FLS F

| Distributed Load | $L_{max}$ | 300         |               | 500             |               | 700             |               |
|------------------|-----------|-------------|---------------|-----------------|---------------|-----------------|---------------|
|                  |           | $H_{max}$   | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ |
|                  | [mm]      | [kN/m]      | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          |
|                  | 500       | <b>7,14</b> | <b>2,14</b>   | <b>2,47</b>     | <b>1,23</b>   | <b>1,16</b>     | <b>0,81</b>   |
|                  | 1000      | <b>6,05</b> | <b>1,82</b>   | <b>2,14</b>     | <b>1,07</b>   | <b>1,02</b>     | <b>0,71</b>   |
|                  | 1500      | <b>5,25</b> | <b>1,57</b>   | <b>1,89</b>     | <b>0,94</b>   | <b>0,91</b>     | <b>0,64</b>   |
|                  | 2000      | <b>4,63</b> | <b>1,39</b>   | <b>1,69</b>     | <b>0,84</b>   | <b>0,82</b>     | <b>0,57</b>   |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | 300         |             | 500                                 |             | 700                                 |             |
|------------|-----------|-------------|-------------|-------------------------------------|-------------|-------------------------------------|-------------|
|            |           | $H_{max}$   | $F_x = 0$   | $F_z, perm$ for $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_z, perm$ for $F_x = \mu_0 * F_z$ | $F_x = 0$   |
|            | [mm]      | [kN]        | [kN]        | [kN]                                | [kN]        | [kN]                                | [kN]        |
|            | 500       | <b>1,08</b> | <b>1,08</b> | <b>0,58</b>                         | <b>0,58</b> | <b>0,37</b>                         | <b>0,37</b> |
|            | 1000      | <b>0,93</b> | <b>0,93</b> | <b>0,51</b>                         | <b>0,51</b> | <b>0,33</b>                         | <b>0,33</b> |
|            | 1500      | <b>0,82</b> | <b>0,82</b> | <b>0,46</b>                         | <b>0,46</b> | <b>0,30</b>                         | <b>0,30</b> |
|            | 2000      | <b>0,73</b> | <b>0,73</b> | <b>0,42</b>                         | <b>0,42</b> | <b>0,27</b>                         | <b>0,27</b> |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads | $L_{max}$ | 300         |             | 500                                 |             | 700                                 |             |
|---------------|-----------|-------------|-------------|-------------------------------------|-------------|-------------------------------------|-------------|
|               |           | $H_{max}$   | $F_x = 0$   | $F_z, perm$ for $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_z, perm$ for $F_x = \mu_0 * F_z$ | $F_x = 0$   |
|               | [mm]      | [kN]        | [kN]        | [kN]                                | [kN]        | [kN]                                | [kN]        |
|               | 500       | <b>0,75</b> | <b>0,75</b> | <b>0,41</b>                         | <b>0,41</b> | <b>0,26</b>                         | <b>0,26</b> |
|               | 1000      | <b>0,64</b> | <b>0,64</b> | <b>0,36</b>                         | <b>0,36</b> | <b>0,23</b>                         | <b>0,23</b> |
|               | 1500      | <b>0,56</b> | <b>0,56</b> | <b>0,32</b>                         | <b>0,32</b> | <b>0,21</b>                         | <b>0,21</b> |
|               | 2000      | <b>0,49</b> | <b>0,49</b> | <b>0,29</b>                         | <b>0,29</b> | <b>0,19</b>                         | <b>0,19</b> |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

| 3 Point Loads | $L_{max}$ | 300         |             | 500                                 |             | 700                                 |             |
|---------------|-----------|-------------|-------------|-------------------------------------|-------------|-------------------------------------|-------------|
|               |           | $H_{max}$   | $F_x = 0$   | $F_z, perm$ for $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_z, perm$ for $F_x = \mu_0 * F_z$ | $F_x = 0$   |
|               | [mm]      | [kN]        | [kN]        | [kN]                                | [kN]        | [kN]                                | [kN]        |
|               | 500       | <b>0,56</b> | <b>0,56</b> | <b>0,31</b>                         | <b>0,31</b> | <b>0,20</b>                         | <b>0,20</b> |
|               | 1000      | <b>0,48</b> | <b>0,48</b> | <b>0,27</b>                         | <b>0,27</b> | <b>0,18</b>                         | <b>0,18</b> |
|               | 1500      | <b>0,42</b> | <b>0,42</b> | <b>0,24</b>                         | <b>0,24</b> | <b>0,16</b>                         | <b>0,16</b> |
|               | 2000      | <b>0,37</b> | <b>0,37</b> | <b>0,22</b>                         | <b>0,22</b> | <b>0,14</b>                         | <b>0,14</b> |

$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

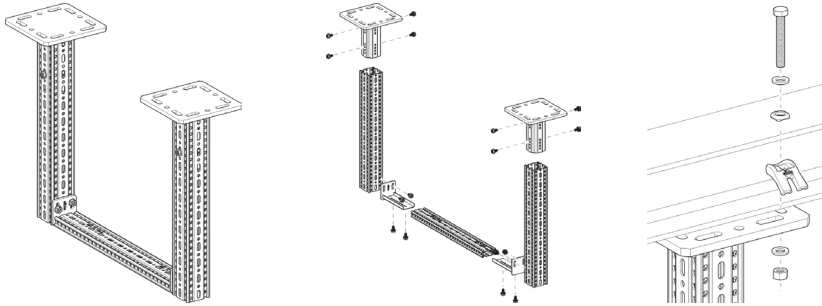
All illustrated structures are able to be installed standing as well.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $H/100$ ;  $L/100$ .



## Working loads in accordance with Eurocode 3

### Frame F 80 - 80/30



#### Part List

- 2 x End Support WBD F 80
- 2 x Beam Section TP F 80
- 1 x Beam Section TP F 80/30
- 2 x End Support STA F 80/30-E
- 16 x Self-Forming-Screw FLS F

| Distributed Load |      | L <sub>max</sub> 500  |                            | 1000                                     |                            | 1500                                     |                            | 2000                                     |                            | 2500                                     |                            | 3000                                     |                            |
|------------------|------|-----------------------|----------------------------|------------------------------------------|----------------------------|------------------------------------------|----------------------------|------------------------------------------|----------------------------|------------------------------------------|----------------------------|------------------------------------------|----------------------------|
|                  |      | H <sub>max</sub> [mm] | q <sub>z,perm</sub> [kN/m] | F <sub>z</sub> (q <sub>z</sub> * L) [kN] | q <sub>z,perm</sub> [kN/m] | F <sub>z</sub> (q <sub>z</sub> * L) [kN] | q <sub>z,perm</sub> [kN/m] | F <sub>z</sub> (q <sub>z</sub> * L) [kN] | q <sub>z,perm</sub> [kN/m] | F <sub>z</sub> (q <sub>z</sub> * L) [kN] | q <sub>z,perm</sub> [kN/m] | F <sub>z</sub> (q <sub>z</sub> * L) [kN] | q <sub>z,perm</sub> [kN/m] |
|                  | 500  | <b>16,75</b>          | <b>8,38</b>                | <b>5,86</b>                              | <b>5,86</b>                | <b>2,04</b>                              | <b>3,05</b>                | <b>0,94</b>                              | <b>1,88</b>                | <b>0,50</b>                              | <b>1,24</b>                | <b>0,28</b>                              | <b>0,84</b>                |
|                  | 1000 | <b>16,75</b>          | <b>8,38</b>                | <b>5,81</b>                              | <b>5,81</b>                | <b>2,02</b>                              | <b>3,03</b>                | <b>0,93</b>                              | <b>1,87</b>                | <b>0,49</b>                              | <b>1,24</b>                | <b>0,28</b>                              | <b>0,84</b>                |
|                  | 1500 | <b>16,75</b>          | <b>8,38</b>                | <b>5,76</b>                              | <b>5,76</b>                | <b>2,01</b>                              | <b>3,02</b>                | <b>0,93</b>                              | <b>1,86</b>                | <b>0,49</b>                              | <b>1,23</b>                | <b>0,28</b>                              | <b>0,84</b>                |
|                  | 2000 | <b>16,75</b>          | <b>8,38</b>                | <b>5,71</b>                              | <b>5,71</b>                | <b>2,00</b>                              | <b>3,00</b>                | <b>0,92</b>                              | <b>1,85</b>                | <b>0,49</b>                              | <b>1,22</b>                | <b>0,28</b>                              | <b>0,83</b>                |

q<sub>z</sub> [kN/m] as permanent load over L.

| Point Load |      | L <sub>max</sub> 500  |                                                                                                  | 1000                                                                                             |                                                                                                  | 1500                                                                                             |                                                                                                  | 2000                                                                                             |                                                                                                  | 2500                                                                                             |                                                                                                  | 3000                                                                                             |             |
|------------|------|-----------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
|            |      | H <sub>max</sub> [mm] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] |             |
|            | 500  | <b>8,32</b>           | <b>6,95</b>                                                                                      | <b>3,72</b>                                                                                      | <b>3,50</b>                                                                                      | <b>1,90</b>                                                                                      | <b>1,79</b>                                                                                      | <b>1,15</b>                                                                                      | <b>1,08</b>                                                                                      | <b>0,77</b>                                                                                      | <b>0,72</b>                                                                                      | <b>0,51</b>                                                                                      | <b>0,48</b> |
|            | 1000 | <b>8,32</b>           | <b>6,95</b>                                                                                      | <b>3,70</b>                                                                                      | <b>3,48</b>                                                                                      | <b>1,89</b>                                                                                      | <b>1,78</b>                                                                                      | <b>1,15</b>                                                                                      | <b>1,08</b>                                                                                      | <b>0,76</b>                                                                                      | <b>0,72</b>                                                                                      | <b>0,51</b>                                                                                      | <b>0,48</b> |
|            | 1500 | <b>8,32</b>           | <b>5,70</b>                                                                                      | <b>3,68</b>                                                                                      | <b>3,46</b>                                                                                      | <b>1,88</b>                                                                                      | <b>1,77</b>                                                                                      | <b>1,14</b>                                                                                      | <b>1,08</b>                                                                                      | <b>0,76</b>                                                                                      | <b>0,72</b>                                                                                      | <b>0,51</b>                                                                                      | <b>0,48</b> |
|            | 2000 | <b>8,32</b>           | <b>3,85</b>                                                                                      | <b>3,65</b>                                                                                      | <b>3,44</b>                                                                                      | <b>1,87</b>                                                                                      | <b>1,76</b>                                                                                      | <b>1,14</b>                                                                                      | <b>1,07</b>                                                                                      | <b>0,76</b>                                                                                      | <b>0,71</b>                                                                                      | <b>0,51</b>                                                                                      | <b>0,48</b> |

F<sub>z</sub> [kN] as a permanent load at distance L/2; F<sub>x</sub> [kN] as a variable load at distance L/2.

| 2 Point Loads |      | L <sub>max</sub> 500  |                                                                                                  | 1000                                                                                             |                                                                                                  | 1500                                                                                             |                                                                                                  | 2000                                                                                             |                                                                                                  | 2500                                                                                             |                                                                                                  | 3000                                                                                             |             |
|---------------|------|-----------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
|               |      | H <sub>max</sub> [mm] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] |             |
|               | 500  | <b>4,17</b>           | <b>3,48</b>                                                                                      | <b>2,20</b>                                                                                      | <b>2,07</b>                                                                                      | <b>1,13</b>                                                                                      | <b>1,06</b>                                                                                      | <b>0,69</b>                                                                                      | <b>0,65</b>                                                                                      | <b>0,46</b>                                                                                      | <b>0,43</b>                                                                                      | <b>0,30</b>                                                                                      | <b>0,28</b> |
|               | 1000 | <b>4,17</b>           | <b>3,48</b>                                                                                      | <b>2,19</b>                                                                                      | <b>2,06</b>                                                                                      | <b>1,12</b>                                                                                      | <b>1,06</b>                                                                                      | <b>0,68</b>                                                                                      | <b>0,64</b>                                                                                      | <b>0,45</b>                                                                                      | <b>0,43</b>                                                                                      | <b>0,30</b>                                                                                      | <b>0,28</b> |
|               | 1500 | <b>4,17</b>           | <b>2,85</b>                                                                                      | <b>2,17</b>                                                                                      | <b>2,04</b>                                                                                      | <b>1,12</b>                                                                                      | <b>1,05</b>                                                                                      | <b>0,68</b>                                                                                      | <b>0,64</b>                                                                                      | <b>0,45</b>                                                                                      | <b>0,42</b>                                                                                      | <b>0,30</b>                                                                                      | <b>0,28</b> |
|               | 2000 | <b>4,17</b>           | <b>1,93</b>                                                                                      | <b>2,16</b>                                                                                      | <b>1,91</b>                                                                                      | <b>1,11</b>                                                                                      | <b>1,04</b>                                                                                      | <b>0,68</b>                                                                                      | <b>0,64</b>                                                                                      | <b>0,45</b>                                                                                      | <b>0,42</b>                                                                                      | <b>0,30</b>                                                                                      | <b>0,28</b> |

F<sub>z</sub> [kN] as permanent loads at distance 2\*L/3 and L/3; F<sub>x</sub> [kN] as variable loads at distance 2\*L/3 and L/3.

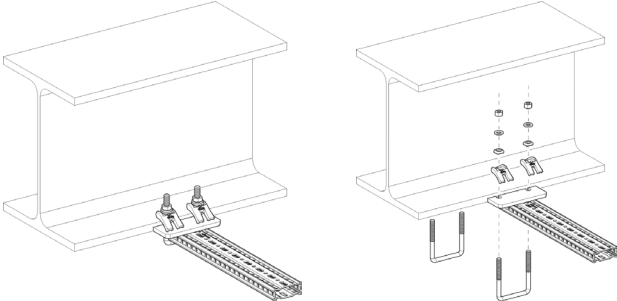
| 3 Point Loads |      | L <sub>max</sub> 500  |                                                                                                  | 1000                                                                                             |                                                                                                  | 1500                                                                                             |                                                                                                  | 2000                                                                                             |                                                                                                  | 2500                                                                                             |                                                                                                  | 3000                                                                                             |             |
|---------------|------|-----------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------|
|               |      | H <sub>max</sub> [mm] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] | F <sub>z,perm</sub> for F <sub>x</sub> = 0 F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> [kN] |             |
|               | 500  | <b>2,78</b>           | <b>2,32</b>                                                                                      | <b>1,56</b>                                                                                      | <b>1,47</b>                                                                                      | <b>0,80</b>                                                                                      | <b>0,75</b>                                                                                      | <b>0,49</b>                                                                                      | <b>0,46</b>                                                                                      | <b>0,32</b>                                                                                      | <b>0,30</b>                                                                                      | <b>0,21</b>                                                                                      | <b>0,20</b> |
|               | 1000 | <b>2,78</b>           | <b>2,32</b>                                                                                      | <b>1,55</b>                                                                                      | <b>1,46</b>                                                                                      | <b>0,79</b>                                                                                      | <b>0,75</b>                                                                                      | <b>0,49</b>                                                                                      | <b>0,46</b>                                                                                      | <b>0,31</b>                                                                                      | <b>0,30</b>                                                                                      | <b>0,21</b>                                                                                      | <b>0,20</b> |
|               | 1500 | <b>2,78</b>           | <b>1,90</b>                                                                                      | <b>1,54</b>                                                                                      | <b>1,45</b>                                                                                      | <b>0,79</b>                                                                                      | <b>0,74</b>                                                                                      | <b>0,49</b>                                                                                      | <b>0,46</b>                                                                                      | <b>0,31</b>                                                                                      | <b>0,29</b>                                                                                      | <b>0,21</b>                                                                                      | <b>0,19</b> |
|               | 2000 | <b>2,78</b>           | <b>1,29</b>                                                                                      | <b>1,53</b>                                                                                      | <b>1,27</b>                                                                                      | <b>0,79</b>                                                                                      | <b>0,74</b>                                                                                      | <b>0,48</b>                                                                                      | <b>0,46</b>                                                                                      | <b>0,31</b>                                                                                      | <b>0,29</b>                                                                                      | <b>0,21</b>                                                                                      | <b>0,19</b> |

F<sub>z</sub> [kN] as permanent loads at distance 3\*L/4, L/2 and L/4; F<sub>x</sub> [kN] as variable loads at distance 3\*L/4, L/4 and L/4.

All illustrated structures are able to be installed standing as well.  
Friction coefficient μ<sub>0</sub> = 0,2 for friction in longitudinal direction. Max. deviation H/100; L/200.

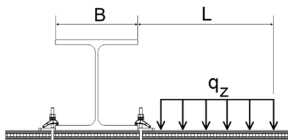
### Working loads in accordance with Eurocode 3

#### Joining Beam Bracket F 80/30 horizontal



**Part List**  
 1 x Beam Section TP F 80/30  
 2 x U-Holder SB F 80/30-40

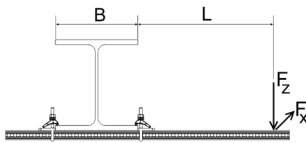
#### Distributed Load



| $L_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} * L)$ |
|-----------|---------------|-------------------------|
| [mm]      | [kN/m]        | [kN]                    |
| 300       | <b>10,62</b>  | <b>3,19</b>             |
| 500       | <b>3,68</b>   | <b>1,84</b>             |
| 700       | <b>1,84</b>   | <b>1,29</b>             |
| 900       | <b>1,09</b>   | <b>0,98</b>             |
| 1100      | <b>0,72</b>   | <b>0,79</b>             |

$q_z$  [kN/m] as permanent load over L;  
 $80 \text{ mm} < B < 200 \text{ mm}$ .

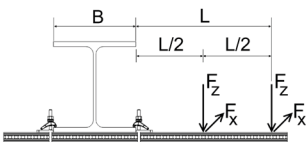
#### Point Load



| $L_{max}$ | $F_{z, perm}$ for |                     |
|-----------|-------------------|---------------------|
|           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| [mm]      | [kN]              | [kN]                |
| 300       | <b>1,52</b>       | <b>0,86</b>         |
| 500       | <b>0,91</b>       | <b>0,74</b>         |
| 700       | <b>0,65</b>       | <b>0,59</b>         |
| 900       | <b>0,50</b>       | <b>0,46</b>         |
| 1100      | <b>0,35</b>       | <b>0,35</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L;  
 $80 \text{ mm} < B < 200 \text{ mm}$ .

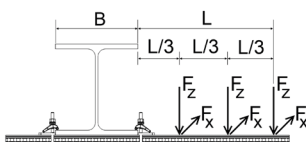
#### 2 Point Loads



| $L_{max}$ | $F_{z, perm}$ for |                     |
|-----------|-------------------|---------------------|
|           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| [mm]      | [kN]              | [kN]                |
| 300       | <b>1,01</b>       | <b>0,54</b>         |
| 500       | <b>0,61</b>       | <b>0,47</b>         |
| 700       | <b>0,43</b>       | <b>0,39</b>         |
| 900       | <b>0,33</b>       | <b>0,31</b>         |
| 1100      | <b>0,27</b>       | <b>0,25</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2;  
 $80 \text{ mm} < B < 200 \text{ mm}$ .

#### 3 Point Loads



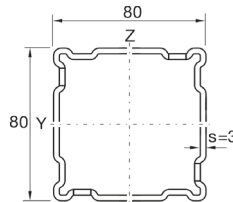
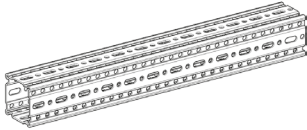
| $L_{max}$ | $F_{z, perm}$ for |                     |
|-----------|-------------------|---------------------|
|           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| [mm]      | [kN]              | [kN]                |
| 300       | <b>0,76</b>       | <b>0,39</b>         |
| 500       | <b>0,45</b>       | <b>0,34</b>         |
| 700       | <b>0,32</b>       | <b>0,30</b>         |
| 900       | <b>0,25</b>       | <b>0,23</b>         |
| 1100      | <b>0,20</b>       | <b>0,19</b>         |

$F_z$  [kN] as permanent loads at distance L,  $2*L/3$  and L/3;  $F_x$  [kN] as variable loads at distance L,  $2*L/3$  and L/3;  $80 \text{ mm} < B < 200 \text{ mm}$ .

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation L/100.

### Working loads in accordance with Eurocode 3

#### Beam Section TP F 80



Single-span beam with uniaxial load  
dead weight of the profile is considered

| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} \cdot L)$ |
|------------------|-----------|---------------|-----------------------------|
|                  | [mm]      | [kN/m]        | [kN]                        |
|                  | 1000      | <b>30,21</b>  | <b>30,21</b>                |
|                  | 1500      | <b>13,38</b>  | <b>20,07</b>                |
|                  | 2000      | <b>6,30</b>   | <b>12,59</b>                |
|                  | 2500      | <b>3,22</b>   | <b>8,06</b>                 |
|                  | 3000      | <b>1,87</b>   | <b>5,60</b>                 |
|                  | 3500      | <b>1,17</b>   | <b>4,11</b>                 |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | $F_{z, perm}$ |
|------------|-----------|---------------|
|            | [mm]      | [kN]          |
|            | 1000      | <b>15,10</b>  |
|            | 1500      | <b>10,04</b>  |
|            | 2000      | <b>7,49</b>   |
|            | 2500      | <b>5,04</b>   |
|            | 3000      | <b>3,50</b>   |
|            | 3500      | <b>2,57</b>   |

$F_z$  [kN] as a permanent load at distance L/2.

| 2 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [kN]          |
|               | 1000      | <b>11,33</b>  |
|               | 1500      | <b>7,53</b>   |
|               | 2000      | <b>4,62</b>   |
|               | 2500      | <b>2,96</b>   |
|               | 3000      | <b>2,05</b>   |
|               | 3500      | <b>1,51</b>   |

$F_z$  [kN] as permanent loads at distance L/3 and 2\*L/3.

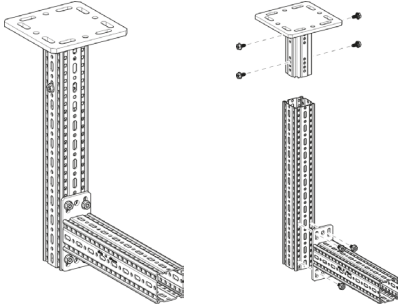
| 3 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [kN]          |
|               | 1000      | <b>7,55</b>   |
|               | 1500      | <b>5,02</b>   |
|               | 2000      | <b>3,31</b>   |
|               | 2500      | <b>2,12</b>   |
|               | 3000      | <b>1,47</b>   |
|               | 3500      | <b>1,08</b>   |

$F_z$  [kN] as permanent loads at distance L/4, L/2 and 3\*L/4.

Max. bending L/200.

## Working loads in accordance with Eurocode 3

### L-Construction TP F 80



- Part List**  
 1 x End Support WBD F 80  
 1 x Beam Section TP F 80  
 1 x Cantilever Bracket AK F 80  
 8 x Self-Forming-Screw FLS F

| H <sub>max</sub><br>[mm] | 300                           |                                             | 500                           |                                             | 700                           |                                             |
|--------------------------|-------------------------------|---------------------------------------------|-------------------------------|---------------------------------------------|-------------------------------|---------------------------------------------|
|                          | q <sub>z,perm</sub><br>[kN/m] | F <sub>z</sub> (q <sub>z</sub> * L)<br>[kN] | q <sub>z,perm</sub><br>[kN/m] | F <sub>z</sub> (q <sub>z</sub> * L)<br>[kN] | q <sub>z,perm</sub><br>[kN/m] | F <sub>z</sub> (q <sub>z</sub> * L)<br>[kN] |
| 500                      | <b>10,42</b>                  | <b>3,13</b>                                 | <b>4,07</b>                   | <b>2,03</b>                                 | <b>2,10</b>                   | <b>1,47</b>                                 |
| 1000                     | <b>8,25</b>                   | <b>2,47</b>                                 | <b>3,25</b>                   | <b>1,62</b>                                 | <b>1,69</b>                   | <b>1,18</b>                                 |
| 1500                     | <b>6,82</b>                   | <b>2,05</b>                                 | <b>2,70</b>                   | <b>1,35</b>                                 | <b>1,40</b>                   | <b>0,98</b>                                 |
| 2000                     | <b>5,81</b>                   | <b>1,74</b>                                 | <b>2,31</b>                   | <b>1,15</b>                                 | <b>1,20</b>                   | <b>0,84</b>                                 |

q<sub>z</sub> [kN/m] as permanent load over L.

| H <sub>max</sub><br>[mm] | 300                    |                                                          | 500                    |                                                          | 700                    |                                                          |
|--------------------------|------------------------|----------------------------------------------------------|------------------------|----------------------------------------------------------|------------------------|----------------------------------------------------------|
|                          | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] |
| 500                      | <b>1,70</b>            | <b>1,70</b>                                              | <b>1,06</b>            | <b>1,06</b>                                              | <b>0,75</b>            | <b>0,75</b>                                              |
| 1000                     | <b>1,36</b>            | <b>1,36</b>                                              | <b>0,85</b>            | <b>0,85</b>                                              | <b>0,60</b>            | <b>0,60</b>                                              |
| 1500                     | <b>1,13</b>            | <b>1,13</b>                                              | <b>0,71</b>            | <b>0,71</b>                                              | <b>0,50</b>            | <b>0,50</b>                                              |
| 2000                     | <b>0,96</b>            | <b>0,96</b>                                              | <b>0,61</b>            | <b>0,61</b>                                              | <b>0,43</b>            | <b>0,43</b>                                              |

F<sub>z</sub> [kN] as a permanent load at distance L; F<sub>x</sub> [kN] as a variable load at distance L.

| H <sub>max</sub><br>[mm] | 300                    |                                                          | 500                    |                                                          | 700                    |                                                          |
|--------------------------|------------------------|----------------------------------------------------------|------------------------|----------------------------------------------------------|------------------------|----------------------------------------------------------|
|                          | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] |
| 500                      | <b>1,11</b>            | <b>1,11</b>                                              | <b>0,70</b>            | <b>0,70</b>                                              | <b>0,50</b>            | <b>0,50</b>                                              |
| 1000                     | <b>0,88</b>            | <b>0,88</b>                                              | <b>0,56</b>            | <b>0,56</b>                                              | <b>0,40</b>            | <b>0,40</b>                                              |
| 1500                     | <b>0,73</b>            | <b>0,73</b>                                              | <b>0,47</b>            | <b>0,47</b>                                              | <b>0,34</b>            | <b>0,34</b>                                              |
| 2000                     | <b>0,63</b>            | <b>0,63</b>                                              | <b>0,40</b>            | <b>0,40</b>                                              | <b>0,29</b>            | <b>0,29</b>                                              |

F<sub>z</sub> [kN] as permanent loads at distance L and L/2; F<sub>x</sub> [kN] as variable loads at distance L and L/2.

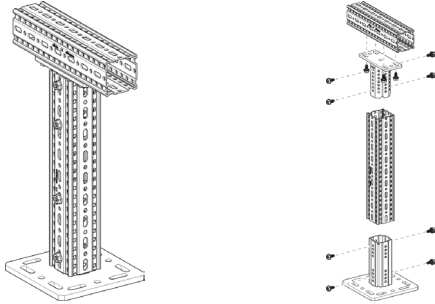
| H <sub>max</sub><br>[mm] | 300                    |                                                          | 500                    |                                                          | 700                    |                                                          |
|--------------------------|------------------------|----------------------------------------------------------|------------------------|----------------------------------------------------------|------------------------|----------------------------------------------------------|
|                          | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] | F <sub>z</sub><br>[kN] | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub><br>[kN] |
| 500                      | <b>0,82</b>            | <b>0,82</b>                                              | <b>0,52</b>            | <b>0,52</b>                                              | <b>0,37</b>            | <b>0,37</b>                                              |
| 1000                     | <b>0,65</b>            | <b>0,65</b>                                              | <b>0,41</b>            | <b>0,41</b>                                              | <b>0,30</b>            | <b>0,30</b>                                              |
| 1500                     | <b>0,54</b>            | <b>0,54</b>                                              | <b>0,35</b>            | <b>0,35</b>                                              | <b>0,25</b>            | <b>0,25</b>                                              |
| 2000                     | <b>0,46</b>            | <b>0,46</b>                                              | <b>0,30</b>            | <b>0,30</b>                                              | <b>0,21</b>            | <b>0,21</b>                                              |

F<sub>z</sub> [kN] as permanent loads at distance L, 2\*L/3 and L/3; F<sub>x</sub> [kN] as variable loads at distance L, 2\*L/3 and L/3.

All illustrated structures are able to be installed standing as well.  
 Friction coefficient μ<sub>0</sub> = 0,2 for friction in longitudinal direction. Max. deviation H/100; L/100.

### Working loads in accordance with Eurocode 3

#### T-Support F 80



#### Part List

- 1 x End Support WBD F 80
- 2 x Beam Section TP F 80
- 1 x End Support STA F 80
- 12 x Self-Forming-Screw FLS F

| Distributed Load - symmetrical | $H_{max}$ | $q_z, perm$  | $F_z (q_z, perm \times 1m)$ |
|--------------------------------|-----------|--------------|-----------------------------|
|                                | [mm]      | [kN/m]       | [kN]                        |
|                                | 500       | <b>13,19</b> | <b>13,19</b>                |
|                                | 1000      | <b>13,15</b> | <b>13,15</b>                |
|                                | 1500      | <b>13,12</b> | <b>13,12</b>                |
|                                | 2000      | <b>13,08</b> | <b>13,08</b>                |

$q_z$  [kN/m] as permanent load over L;  $L_{max} = 1.100$  mm.

| Point Load - central | $H_{max}$ | $F_z, perm$ for |                     |
|----------------------|-----------|-----------------|---------------------|
|                      |           | $F_x = 0$       | $F_x = \mu_0 * F_z$ |
|                      | [mm]      | [kN]            | [kN]                |
|                      | 500       | <b>11,53</b>    | <b>8,78</b>         |
|                      | 1000      | <b>11,50</b>    | <b>3,65</b>         |
|                      | 1500      | <b>10,63</b>    | <b>2,10</b>         |
|                      | 2000      | <b>9,15</b>     | <b>1,41</b>         |

$F_z$  [kN] as a permanent load;  $F_x$  [kN] as a variable load; central load introduction for planned eccentricity  $\pm 50$  mm.

| 2 Point Loads - symmetrical | $H_{max}$ | $F_z, perm$ for |                     |
|-----------------------------|-----------|-----------------|---------------------|
|                             |           | $F_x = 0$       | $F_x = \mu_0 * F_z$ |
|                             | [mm]      | [kN]            | [kN]                |
|                             | 500       | <b>6,46</b>     | <b>4,32</b>         |
|                             | 1000      | <b>6,46</b>     | <b>1,88</b>         |
|                             | 1500      | <b>6,46</b>     | <b>1,07</b>         |
|                             | 2000      | <b>6,46</b>     | <b>0,71</b>         |

$F_z$  [kN] as permanent loads;  $F_x$  [kN] as variable loads;  $L_{max} = 1.100$  mm.

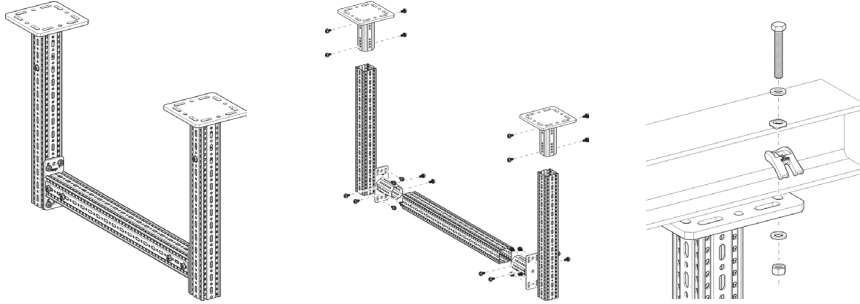
| 3 Point Loads - symmetrical | $H_{max}$ | $F_z, perm$ for |                     |
|-----------------------------|-----------|-----------------|---------------------|
|                             |           | $F_x = 0$       | $F_x = \mu_0 * F_z$ |
|                             | [mm]      | [kN]            | [kN]                |
|                             | 500       | <b>4,39</b>     | <b>3,16</b>         |
|                             | 1000      | <b>4,38</b>     | <b>1,25</b>         |
|                             | 1500      | <b>4,37</b>     | <b>0,71</b>         |
|                             | 2000      | <b>4,36</b>     | <b>0,47</b>         |

$F_z$  [kN] as permanent loads;  $F_x$  [kN] as variable loads;  $L_{max} = 1.100$  mm.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $H/150$ .

## Working loads in accordance with Eurocode 3

### Frame F 80



**Part List**

- 2 x End Support WBD F 80
- 3 x Beam Section TP F 80
- 2 x End Support STA F 80
- 24 x Self-Forming-Screw FLS

| Distributed Load |      | $L_{max}$ |       | 500                  |                      | 1000                 |                      | 1500                 |                      | 2000                 |                      | 2500                 |                      | 3000                 |                      |
|------------------|------|-----------|-------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                  |      | $H_{max}$ | [mm]  | $q_{z, perm}$ [kN/m] | $F_z (q_z * L)$ [kN] | $q_{z, perm}$ [kN/m] | $F_z (q_z * L)$ [kN] | $q_{z, perm}$ [kN/m] | $F_z (q_z * L)$ [kN] | $q_{z, perm}$ [kN/m] | $F_z (q_z * L)$ [kN] | $q_{z, perm}$ [kN/m] | $F_z (q_z * L)$ [kN] | $q_{z, perm}$ [kN/m] | $F_z (q_z * L)$ [kN] |
|                  | 1000 | 39,47     | 19,37 | 19,37                | 19,37                | 19,37                | 12,56                | 18,85                | 6,76                 | 13,52                | 3,89                 | 9,71                 | 2,43                 | 7,30                 |                      |
|                  | 1500 | 39,47     | 19,37 | 19,37                | 19,37                | 12,66                | 18,99                | 6,65                 | 13,29                | 3,82                 | 9,55                 | 2,39                 | 7,18                 |                      |                      |
|                  | 2000 | 39,47     | 19,37 | 19,37                | 19,37                | 12,56                | 18,83                | 6,55                 | 13,09                | 3,76                 | 9,41                 | 2,36                 | 7,07                 |                      |                      |
|                  | 2500 | 39,47     | 19,37 | 19,37                | 19,37                | 12,43                | 18,64                | 6,46                 | 12,91                | 3,71                 | 9,28                 | 2,32                 | 6,97                 |                      |                      |
|                  | 3000 | 39,47     | 19,37 | 19,37                | 19,37                | 12,27                | 18,40                | 6,38                 | 12,75                | 3,67                 | 9,16                 | 2,29                 | 6,88                 |                      |                      |

$q_z$  [kN/m] as permanent load over  $L$ .

| Point Load |      | $L_{max}$ |      | 500       |                     | 1000      |                     | 1500      |                     | 2000      |                     | 2500      |                     | 3000      |                     |
|------------|------|-----------|------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|
|            |      | $H_{max}$ | [mm] | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ |
|            | 1000 | 19,67     | 9,02 | 16,21     | 8,76                | 11,21     | 8,18                | 8,63      | 6,56                | 6,08      | 5,38                | 4,52      | 4,25                |           |                     |
|            | 1500 | 19,67     | 5,49 | 16,13     | 5,42                | 11,15     | 5,26                | 8,51      | 5,00                | 5,99      | 4,63                | 4,45      | 4,18                |           |                     |
|            | 2000 | 19,67     | 3,74 | 16,04     | 3,72                | 11,09     | 3,66                | 8,40      | 3,56                | 5,92      | 3,41                | 4,39      | 3,22                |           |                     |
|            | 2500 | 19,67     | 2,74 | 15,96     | 2,73                | 11,04     | 2,70                | 8,31      | 2,65                | 5,85      | 2,59                | 4,34      | 2,49                |           |                     |
|            | 3000 | 19,67     | 2,09 | 15,89     | 2,09                | 10,98     | 2,08                | 8,22      | 2,05                | 5,78      | 2,02                | 4,29      | 1,97                |           |                     |

$F_z$  [kN] as a permanent load at distance  $L/2$ ;  $F_x$  [kN] as a variable load at distance  $L/2$ .

| 2 Point Loads |      | $L_{max}$ |      | 500       |                     | 1000      |                     | 1500      |                     | 2000      |                     | 2500      |                     | 3000      |                     |
|---------------|------|-----------|------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|
|               |      | $H_{max}$ | [mm] | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ |
|               | 1000 | 9,85      | 4,52 | 9,60      | 4,40                | 7,61      | 4,15                | 5,10      | 3,76                | 3,61      | 3,27                | 2,69      | 2,53                |           |                     |
|               | 1500 | 9,85      | 2,75 | 9,60      | 2,72                | 7,49      | 2,65                | 5,02      | 2,53                | 3,55      | 2,37                | 2,65      | 2,17                |           |                     |
|               | 2000 | 9,85      | 1,87 | 9,60      | 1,86                | 7,38      | 1,84                | 4,95      | 1,79                | 3,51      | 1,73                | 2,61      | 1,64                |           |                     |
|               | 2500 | 9,85      | 1,37 | 9,60      | 1,36                | 7,29      | 1,35                | 4,89      | 1,33                | 3,46      | 1,30                | 2,58      | 1,26                |           |                     |
|               | 3000 | 9,85      | 1,05 | 9,60      | 1,04                | 7,20      | 1,04                | 4,83      | 1,03                | 3,42      | 1,01                | 2,55      | 0,99                |           |                     |

$F_z$  [kN] as permanent loads at distance  $2*L/3$  and  $L/3$ ;  $F_x$  [kN] as variable loads at distance  $2*L/3$  and  $L/3$ .

| 3 Point Loads |      | $L_{max}$ |      | 500       |                     | 1000      |                     | 1500      |                     | 2000      |                     | 2500      |                     | 3000      |                     |
|---------------|------|-----------|------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|
|               |      | $H_{max}$ | [mm] | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ |
|               | 1000 | 6,57      | 3,01 | 6,42      | 2,94                | 5,37      | 2,78                | 3,63      | 2,54                | 2,58      | 2,22                | 1,93      | 1,81                |           |                     |
|               | 1500 | 6,57      | 1,83 | 6,42      | 1,81                | 5,29      | 1,77                | 3,57      | 1,70                | 2,54      | 1,60                | 1,90      | 1,47                |           |                     |
|               | 2000 | 6,57      | 1,25 | 6,42      | 1,24                | 5,21      | 1,23                | 3,52      | 1,20                | 2,50      | 1,16                | 1,87      | 1,10                |           |                     |
|               | 2500 | 6,57      | 0,91 | 6,42      | 0,91                | 5,14      | 0,90                | 3,48      | 0,89                | 2,47      | 0,87                | 1,85      | 0,85                |           |                     |
|               | 3000 | 6,57      | 0,70 | 6,42      | 0,70                | 5,08      | 0,69                | 3,44      | 0,69                | 2,44      | 0,68                | 1,82      | 0,66                |           |                     |

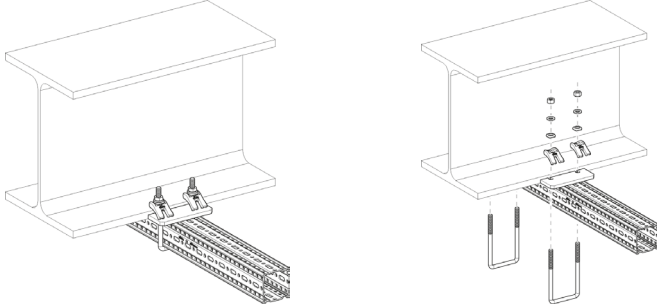
$F_z$  [kN] as permanent loads at distance  $3*L/4$ ,  $L/2$  and  $L/4$ ;  $F_x$  [kN] as variable loads at distance  $3*L/4$ ,  $L/4$  and  $L/4$ .

All illustrated structures are able to be installed standing as well.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $H/100$ ;  $L/200$ .

## Working loads in accordance with Eurocode 3

### Joining Beam Bracket F 80 horizontal



#### Part List

- 1 x Beam Section TP F 80
- 2 x U-Holder SB F 80-40

| Distributed Load |      | 100           |                 | 150           |                 | 200           |                 | 250           |                 | 300           |                 |
|------------------|------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
|                  |      | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
| $L_{max}$        | [mm] | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            |
|                  | 300  | <b>14,39</b>  | <b>4,32</b>     | <b>20,42</b>  | <b>6,13</b>     | <b>24,82</b>  | <b>7,45</b>     | <b>28,17</b>  | <b>8,45</b>     | <b>30,72</b>  | <b>9,22</b>     |
|                  | 500  | <b>5,64</b>   | <b>2,82</b>     | <b>8,38</b>   | <b>4,19</b>     | <b>10,53</b>  | <b>5,26</b>     | <b>12,27</b>  | <b>6,13</b>     | <b>12,28</b>  | <b>6,14</b>     |
|                  | 700  | <b>3,02</b>   | <b>2,12</b>     | <b>4,62</b>   | <b>3,23</b>     | <b>5,93</b>   | <b>4,15</b>     | <b>6,19</b>   | <b>4,34</b>     | <b>6,19</b>   | <b>4,34</b>     |
|                  | 900  | <b>1,88</b>   | <b>1,69</b>     | <b>2,93</b>   | <b>2,64</b>     | <b>3,72</b>   | <b>3,35</b>     | <b>3,72</b>   | <b>3,35</b>     | <b>3,72</b>   | <b>3,35</b>     |
|                  | 1100 | <b>1,28</b>   | <b>1,41</b>     | <b>2,02</b>   | <b>2,22</b>     | <b>2,47</b>   | <b>2,72</b>     | <b>2,47</b>   | <b>2,72</b>     | <b>2,47</b>   | <b>2,72</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load |      | 100                         |                                       | 150                         |                                       | 200                         |                                       | 250                         |                                       | 300                         |                                       |
|------------|------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|
|            |      | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ |
| $L_{max}$  | [mm] | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  |
|            | 300  | <b>2,36</b>                 | <b>1,12</b>                           | <b>3,51</b>                 | <b>1,67</b>                           | <b>4,43</b>                 | <b>2,10</b>                           | <b>5,04</b>                 | <b>2,45</b>                           | <b>5,04</b>                 | <b>2,75</b>                           |
|            | 500  | <b>1,55</b>                 | <b>0,74</b>                           | <b>2,41</b>                 | <b>1,14</b>                           | <b>3,02</b>                 | <b>1,49</b>                           | <b>3,02</b>                 | <b>1,79</b>                           | <b>3,02</b>                 | <b>2,05</b>                           |
|            | 700  | <b>1,16</b>                 | <b>0,55</b>                           | <b>1,83</b>                 | <b>0,87</b>                           | <b>2,16</b>                 | <b>1,15</b>                           | <b>2,16</b>                 | <b>1,41</b>                           | <b>2,16</b>                 | <b>1,63</b>                           |
|            | 900  | <b>0,92</b>                 | <b>0,44</b>                           | <b>1,48</b>                 | <b>0,70</b>                           | <b>1,68</b>                 | <b>0,94</b>                           | <b>1,68</b>                 | <b>1,16</b>                           | <b>1,68</b>                 | <b>1,36</b>                           |
|            | 1100 | <b>0,77</b>                 | <b>0,36</b>                           | <b>1,24</b>                 | <b>0,59</b>                           | <b>1,37</b>                 | <b>0,79</b>                           | <b>1,37</b>                 | <b>0,99</b>                           | <b>1,37</b>                 | <b>1,16</b>                           |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads |      | 100                         |                                       | 150                         |                                       | 200                         |                                       | 250                         |                                       | 300                         |                                       |
|---------------|------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|
|               |      | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ |
| $L_{max}$     | [mm] | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  |
|               | 300  | <b>1,46</b>                 | <b>0,69</b>                           | <b>2,12</b>                 | <b>1,01</b>                           | <b>2,62</b>                 | <b>1,24</b>                           | <b>3,01</b>                 | <b>1,43</b>                           | <b>3,32</b>                 | <b>1,57</b>                           |
|               | 500  | <b>0,98</b>                 | <b>0,47</b>                           | <b>1,50</b>                 | <b>0,71</b>                           | <b>1,92</b>                 | <b>0,91</b>                           | <b>2,01</b>                 | <b>1,08</b>                           | <b>2,01</b>                 | <b>1,22</b>                           |
|               | 700  | <b>0,74</b>                 | <b>0,35</b>                           | <b>1,16</b>                 | <b>0,55</b>                           | <b>1,44</b>                 | <b>0,72</b>                           | <b>1,44</b>                 | <b>0,86</b>                           | <b>1,44</b>                 | <b>0,99</b>                           |
|               | 900  | <b>0,60</b>                 | <b>0,28</b>                           | <b>0,94</b>                 | <b>0,45</b>                           | <b>1,12</b>                 | <b>0,59</b>                           | <b>1,12</b>                 | <b>0,72</b>                           | <b>1,12</b>                 | <b>0,84</b>                           |
|               | 1100 | <b>0,50</b>                 | <b>0,24</b>                           | <b>0,79</b>                 | <b>0,38</b>                           | <b>0,91</b>                 | <b>0,50</b>                           | <b>0,91</b>                 | <b>0,62</b>                           | <b>0,91</b>                 | <b>0,72</b>                           |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

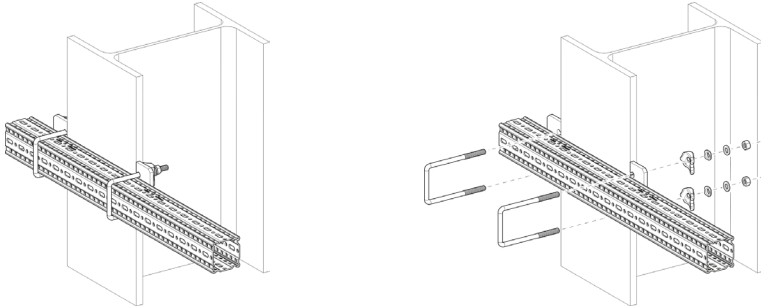
| 3 Point Loads |      | 100                         |                                       | 150                         |                                       | 200                         |                                       | 250                         |                                       | 300                         |                                       |
|---------------|------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|
|               |      | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ |
| $L_{max}$     | [mm] | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  |
|               | 300  | <b>1,06</b>                 | <b>0,50</b>                           | <b>1,52</b>                 | <b>0,72</b>                           | <b>1,86</b>                 | <b>0,88</b>                           | <b>2,12</b>                 | <b>1,00</b>                           | <b>2,33</b>                 | <b>1,10</b>                           |
|               | 500  | <b>0,72</b>                 | <b>0,34</b>                           | <b>1,08</b>                 | <b>0,52</b>                           | <b>1,38</b>                 | <b>0,65</b>                           | <b>1,51</b>                 | <b>0,77</b>                           | <b>1,51</b>                 | <b>0,87</b>                           |
|               | 700  | <b>0,55</b>                 | <b>0,26</b>                           | <b>0,84</b>                 | <b>0,40</b>                           | <b>1,08</b>                 | <b>0,52</b>                           | <b>1,08</b>                 | <b>0,62</b>                           | <b>1,08</b>                 | <b>0,71</b>                           |
|               | 900  | <b>0,44</b>                 | <b>0,21</b>                           | <b>0,69</b>                 | <b>0,33</b>                           | <b>0,84</b>                 | <b>0,43</b>                           | <b>0,84</b>                 | <b>0,52</b>                           | <b>0,84</b>                 | <b>0,61</b>                           |
|               | 1100 | <b>0,37</b>                 | <b>0,18</b>                           | <b>0,58</b>                 | <b>0,28</b>                           | <b>0,68</b>                 | <b>0,37</b>                           | <b>0,68</b>                 | <b>0,45</b>                           | <b>0,68</b>                 | <b>0,53</b>                           |

$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation L/100.

## Working loads in accordance with Eurocode 3

### Joining Beam Bracket F 80 vertical



**Part List**  
 1 x Beam Section TP F 80  
 2 x U-Holder SB F 80-40

| Distributed Load |      | B           |               | 100             |               | 150             |               | 200             |               | 250             |               | 300             |               |
|------------------|------|-------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|
|                  |      | $L_{max}$   | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ |
|                  | [mm] | [kN/m]      | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          |
| 300              |      | <b>3,21</b> | <b>0,96</b>   | <b>4,46</b>     | <b>1,34</b>   | <b>5,34</b>     | <b>1,60</b>   | <b>5,99</b>     | <b>1,80</b>   | <b>6,49</b>     | <b>1,95</b>   |                 |               |
| 500              |      | <b>1,36</b> | <b>0,68</b>   | <b>1,98</b>     | <b>0,99</b>   | <b>2,47</b>     | <b>1,23</b>   | <b>2,86</b>     | <b>1,43</b>   | <b>3,17</b>     | <b>1,58</b>   |                 |               |
| 700              |      | <b>0,75</b> | <b>0,52</b>   | <b>1,13</b>     | <b>0,79</b>   | <b>1,44</b>     | <b>1,00</b>   | <b>1,69</b>     | <b>1,18</b>   | <b>1,91</b>     | <b>1,34</b>   |                 |               |
| 900              |      | <b>0,47</b> | <b>0,43</b>   | <b>0,73</b>     | <b>0,65</b>   | <b>0,94</b>     | <b>0,85</b>   | <b>1,12</b>     | <b>1,01</b>   | <b>1,28</b>     | <b>1,15</b>   |                 |               |
| 1100             |      | <b>0,33</b> | <b>0,36</b>   | <b>0,51</b>     | <b>0,56</b>   | <b>0,67</b>     | <b>0,73</b>   | <b>0,80</b>     | <b>0,88</b>   | <b>0,92</b>     | <b>1,02</b>   |                 |               |

$q_z$  [kN/m] as permanent load over L.

| Point Load |      | B           |                             | 100                                   |                             | 150                                   |                             | 200                                   |                             | 250                                   |                             | 300                                   |                             |
|------------|------|-------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|
|            |      | $L_{max}$   | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ |
|            | [mm] | [kN]        | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        |
| 300        |      | <b>0,59</b> | <b>0,56</b>                 | <b>0,88</b>                           | <b>0,84</b>                 | <b>1,11</b>                           | <b>1,06</b>                 | <b>1,29</b>                           | <b>1,24</b>                 | <b>1,45</b>                           | <b>1,39</b>                 |                                       |                             |
| 500        |      | <b>0,39</b> | <b>0,37</b>                 | <b>0,60</b>                           | <b>0,58</b>                 | <b>0,79</b>                           | <b>0,75</b>                 | <b>0,94</b>                           | <b>0,90</b>                 | <b>1,08</b>                           | <b>1,03</b>                 |                                       |                             |
| 700        |      | <b>0,29</b> | <b>0,28</b>                 | <b>0,46</b>                           | <b>0,44</b>                 | <b>0,61</b>                           | <b>0,58</b>                 | <b>0,74</b>                           | <b>0,71</b>                 | <b>0,86</b>                           | <b>0,83</b>                 |                                       |                             |
| 900        |      | <b>0,23</b> | <b>0,22</b>                 | <b>0,37</b>                           | <b>0,35</b>                 | <b>0,50</b>                           | <b>0,48</b>                 | <b>0,61</b>                           | <b>0,59</b>                 | <b>0,72</b>                           | <b>0,69</b>                 |                                       |                             |
| 1100       |      | <b>0,19</b> | <b>0,18</b>                 | <b>0,31</b>                           | <b>0,30</b>                 | <b>0,42</b>                           | <b>0,40</b>                 | <b>0,52</b>                           | <b>0,50</b>                 | <b>0,61</b>                           | <b>0,59</b>                 |                                       |                             |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads |      | B           |                             | 100                                   |                             | 150                                   |                             | 200                                   |                             | 250                                   |                             | 300                                   |                             |
|---------------|------|-------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|
|               |      | $L_{max}$   | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ |
|               | [mm] | [kN]        | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        |
| 300           |      | <b>0,37</b> | <b>0,35</b>                 | <b>0,53</b>                           | <b>0,51</b>                 | <b>0,65</b>                           | <b>0,63</b>                 | <b>0,75</b>                           | <b>0,72</b>                 | <b>0,83</b>                           | <b>0,80</b>                 |                                       |                             |
| 500           |      | <b>0,25</b> | <b>0,24</b>                 | <b>0,37</b>                           | <b>0,36</b>                 | <b>0,48</b>                           | <b>0,46</b>                 | <b>0,57</b>                           | <b>0,54</b>                 | <b>0,64</b>                           | <b>0,62</b>                 |                                       |                             |
| 700           |      | <b>0,19</b> | <b>0,18</b>                 | <b>0,29</b>                           | <b>0,28</b>                 | <b>0,38</b>                           | <b>0,36</b>                 | <b>0,46</b>                           | <b>0,44</b>                 | <b>0,52</b>                           | <b>0,50</b>                 |                                       |                             |
| 900           |      | <b>0,15</b> | <b>0,14</b>                 | <b>0,24</b>                           | <b>0,23</b>                 | <b>0,31</b>                           | <b>0,30</b>                 | <b>0,38</b>                           | <b>0,36</b>                 | <b>0,44</b>                           | <b>0,42</b>                 |                                       |                             |
| 1100          |      | <b>0,13</b> | <b>0,12</b>                 | <b>0,20</b>                           | <b>0,19</b>                 | <b>0,27</b>                           | <b>0,26</b>                 | <b>0,33</b>                           | <b>0,31</b>                 | <b>0,38</b>                           | <b>0,37</b>                 |                                       |                             |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

| 3 Point Loads |      | B           |                             | 100                                   |                             | 150                                   |                             | 200                                   |                             | 250                                   |                             | 300                                   |                             |
|---------------|------|-------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|
|               |      | $L_{max}$   | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ |
|               | [mm] | [kN]        | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        |
| 300           |      | <b>0,27</b> | <b>0,25</b>                 | <b>0,38</b>                           | <b>0,36</b>                 | <b>0,46</b>                           | <b>0,45</b>                 | <b>0,53</b>                           | <b>0,51</b>                 | <b>0,58</b>                           | <b>0,56</b>                 |                                       |                             |
| 500           |      | <b>0,18</b> | <b>0,17</b>                 | <b>0,27</b>                           | <b>0,26</b>                 | <b>0,35</b>                           | <b>0,33</b>                 | <b>0,41</b>                           | <b>0,39</b>                 | <b>0,46</b>                           | <b>0,44</b>                 |                                       |                             |
| 700           |      | <b>0,14</b> | <b>0,13</b>                 | <b>0,21</b>                           | <b>0,20</b>                 | <b>0,28</b>                           | <b>0,26</b>                 | <b>0,33</b>                           | <b>0,32</b>                 | <b>0,38</b>                           | <b>0,36</b>                 |                                       |                             |
| 900           |      | <b>0,11</b> | <b>0,11</b>                 | <b>0,17</b>                           | <b>0,17</b>                 | <b>0,23</b>                           | <b>0,22</b>                 | <b>0,28</b>                           | <b>0,27</b>                 | <b>0,32</b>                           | <b>0,31</b>                 |                                       |                             |
| 1100          |      | <b>0,09</b> | <b>0,09</b>                 | <b>0,15</b>                           | <b>0,14</b>                 | <b>0,20</b>                           | <b>0,19</b>                 | <b>0,24</b>                           | <b>0,23</b>                 | <b>0,28</b>                           | <b>0,27</b>                 |                                       |                             |

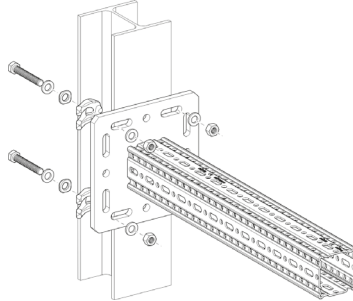
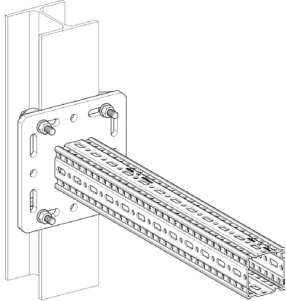
$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation L/100.



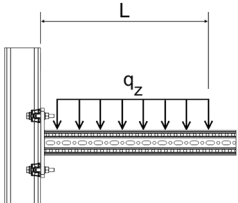
## Working loads in accordance with Eurocode 3

### Beam Bracket F 80 - Variante a) clamped

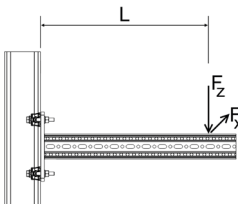


**Part List**

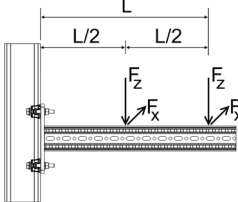
- 1 x Beam Bracket TKO F 80
- 1 x Assembly Set MS 5P M12 S

| <b>Distributed Load</b><br> | $L_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} * L)$ |
|--------------------------------------------------------------------------------------------------------------|-----------|---------------|-------------------------|
|                                                                                                              | [mm]      | [kN/m]        | [kN]                    |
|                                                                                                              | 300       | <b>54,99</b>  | <b>16,50</b>            |
|                                                                                                              | 500       | <b>28,59</b>  | <b>14,30</b>            |
|                                                                                                              | 700       | <b>14,59</b>  | <b>10,21</b>            |

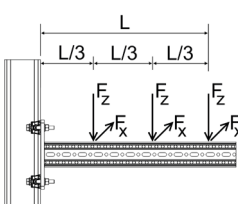
$q_z$  [kN/m] as permanent load over L.

| <b>Point Load</b><br> | $L_{max}$ | $F_{z, perm}$ for |                     |
|----------------------------------------------------------------------------------------------------------|-----------|-------------------|---------------------|
|                                                                                                          |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                                                                                          | [mm]      | [kN]              | [kN]                |
|                                                                                                          | 300       | <b>11,91</b>      | <b>7,40</b>         |
|                                                                                                          | 500       | <b>7,15</b>       | <b>4,44</b>         |
|                                                                                                          | 700       | <b>5,04</b>       | <b>3,17</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| <b>2 Point Loads</b><br> | $L_{max}$ | $F_{z, perm}$ for |                     |
|-------------------------------------------------------------------------------------------------------------|-----------|-------------------|---------------------|
|                                                                                                             |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                                                                                             | [mm]      | [kN]              | [kN]                |
|                                                                                                             | 300       | <b>7,94</b>       | <b>4,93</b>         |
|                                                                                                             | 500       | <b>4,77</b>       | <b>2,96</b>         |
|                                                                                                             | 700       | <b>3,40</b>       | <b>2,11</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

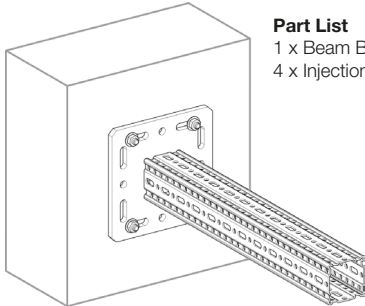
| <b>3 Point Loads</b><br> | $L_{max}$ | $F_{z, perm}$ for |                     |
|-------------------------------------------------------------------------------------------------------------|-----------|-------------------|---------------------|
|                                                                                                             |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                                                                                             | [mm]      | [kN]              | [kN]                |
|                                                                                                             | 300       | <b>5,96</b>       | <b>3,70</b>         |
|                                                                                                             | 500       | <b>3,57</b>       | <b>2,22</b>         |
|                                                                                                             | 700       | <b>2,55</b>       | <b>1,58</b>         |

$F_z$  [kN] as permanent loads at distance L,  $2*L/3$  and  $L/3$ ;  
 $F_x$  [kN] as variable loads at distance L,  $2*L/3$  and  $L/3$ .

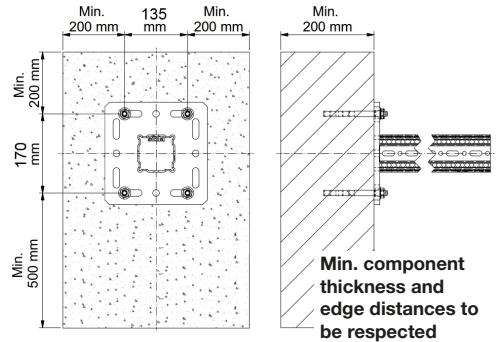
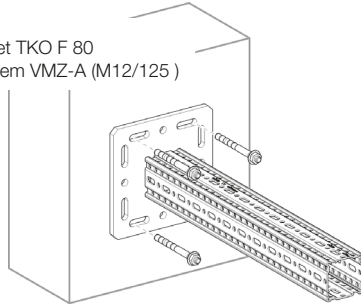
Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $L/100$ .

### Working loads in accordance with Eurocode 3

#### Beam Bracket F 80 - Variante b) anchored



**Part List**  
 1 x Beam Bracket TKO F 80  
 4 x Injection system VMZ-A (M12/125)



| <br>Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} * L)$ |
|----------------------|-----------|---------------|-------------------------|
|                      | [mm]      | [kN/m]        | [kN]                    |
|                      | 300       | <b>42,31</b>  | <b>12,69</b>            |
|                      | 500       | <b>21,76</b>  | <b>10,88</b>            |
|                      | 700       | <b>13,61</b>  | <b>9,52</b>             |

$q_z$  [kN/m] as permanent load at distance L.

| <br>Point Load | $L_{max}$ | $F_{z, perm}$ for |                     |
|----------------|-----------|-------------------|---------------------|
|                |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                | [mm]      | [kN]              | [kN]                |
|                | 300       | <b>10,16</b>      | <b>10,16</b>        |
|                | 500       | <b>7,37</b>       | <b>7,37</b>         |
|                | 700       | <b>4,44</b>       | <b>4,44</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| <br>2 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|-------------------|-----------|-------------------|---------------------|
|                   |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                   | [mm]      | [kN]              | [kN]                |
|                   | 300       | <b>5,64</b>       | <b>5,64</b>         |
|                   | 500       | <b>4,62</b>       | <b>4,62</b>         |
|                   | 700       | <b>3,18</b>       | <b>3,18</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

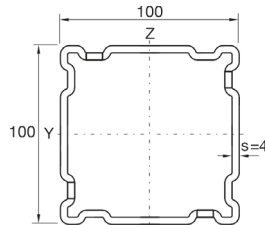
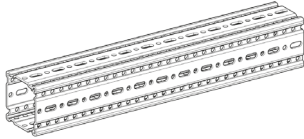
| <br>3 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|-------------------|-----------|-------------------|---------------------|
|                   |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                   | [mm]      | [kN]              | [kN]                |
|                   | 300       | <b>3,91</b>       | <b>3,91</b>         |
|                   | 500       | <b>3,24</b>       | <b>3,24</b>         |
|                   | 700       | <b>2,44</b>       | <b>2,44</b>         |

$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  
 $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $L/100$ .

### Working loads in accordance with Eurocode 3

#### Beam Section TP F 100



Single-span beam with uniaxial load  
dead weight of the profile is considered

| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} * L)$ |
|------------------|-----------|---------------|-------------------------|
|                  | [mm]      | [kN/m]        | [kN]                    |
|                  | 1000      | <b>70,50</b>  | <b>70,50</b>            |
|                  | 2000      | <b>17,53</b>  | <b>35,06</b>            |
|                  | 3000      | <b>5,37</b>   | <b>16,11</b>            |
|                  | 4000      | <b>2,27</b>   | <b>9,06</b>             |
|                  | 5000      | <b>1,16</b>   | <b>5,80</b>             |
|                  | 6000      | <b>0,67</b>   | <b>4,03</b>             |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | $F_{z, perm}$ |
|------------|-----------|---------------|
|            | [mm]      | [kN]          |
|            | 1000      | <b>35,30</b>  |
|            | 2000      | <b>17,50</b>  |
|            | 3000      | <b>10,10</b>  |
|            | 4000      | <b>5,70</b>   |
|            | 5000      | <b>3,60</b>   |
|            | 6000      | <b>2,50</b>   |

$F_z$  [kN] as a permanent load at L/2.

| 2 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [kN]          |
|               | 1000      | <b>26,40</b>  |
|               | 2000      | <b>13,10</b>  |
|               | 3000      | <b>5,90</b>   |
|               | 4000      | <b>3,30</b>   |
|               | 5000      | <b>2,10</b>   |
|               | 6000      | <b>1,50</b>   |

$F_z$  [kN] as permanent loads at L/3 and 2\*L/3.

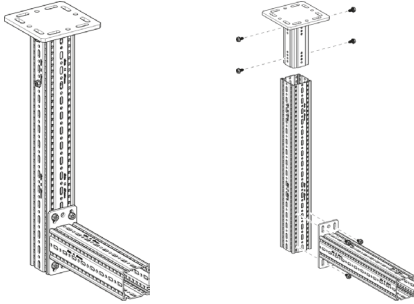
| 3 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [kN]          |
|               | 1000      | <b>17,60</b>  |
|               | 2000      | <b>8,80</b>   |
|               | 3000      | <b>4,20</b>   |
|               | 4000      | <b>2,40</b>   |
|               | 5000      | <b>1,50</b>   |
|               | 6000      | <b>1,10</b>   |

$F_z$  [kN] as permanent loads at L/4, L/2 and 3\*L/4.

Max. bending L/200.

## Working loads in accordance with Eurocode 3

### L-Construction F 100



- Part List**  
 1 x End Support WBD F 100  
 1 x Beam Section TP F 100  
 1 x Cantilever Bracket AK F 100  
 8 x Self-Forming-Screw FLS F

| Distributed Load | $H_{max}$<br>[mm] | 300                     |                         | 500                     |                         | 700                     |                         | 900                     |                         | 1100                    |                         |
|------------------|-------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|                  |                   | $q_{z, perm}$<br>[kN/m] | $F_z (q_z * L)$<br>[kN] | $q_{z, perm}$<br>[kN/m] | $F_z (q_z * L)$<br>[kN] | $q_{z, perm}$<br>[kN/m] | $F_z (q_z * L)$<br>[kN] | $q_{z, perm}$<br>[kN/m] | $F_z (q_z * L)$<br>[kN] | $q_{z, perm}$<br>[kN/m] | $F_z (q_z * L)$<br>[kN] |
|                  | 1000              | <b>18,91</b>            | <b>5,67</b>             | <b>7,70</b>             | <b>3,85</b>             | <b>4,08</b>             | <b>2,86</b>             | <b>2,48</b>             | <b>2,24</b>             | <b>1,65</b>             | <b>1,81</b>             |
|                  | 1500              | <b>16,01</b>            | <b>4,80</b>             | <b>6,55</b>             | <b>3,28</b>             | <b>3,48</b>             | <b>2,44</b>             | <b>2,12</b>             | <b>1,91</b>             | <b>1,40</b>             | <b>1,55</b>             |
|                  | 2000              | <b>13,88</b>            | <b>4,16</b>             | <b>5,70</b>             | <b>2,85</b>             | <b>3,03</b>             | <b>2,12</b>             | <b>1,85</b>             | <b>1,66</b>             | <b>1,22</b>             | <b>1,34</b>             |
|                  | 2500              | <b>12,25</b>            | <b>3,67</b>             | <b>5,04</b>             | <b>2,52</b>             | <b>2,68</b>             | <b>1,88</b>             | <b>1,63</b>             | <b>1,47</b>             | <b>1,08</b>             | <b>1,18</b>             |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $H_{max}$<br>[mm] | 300               |                             | 500               |                             | 700               |                             | 900               |                             | 1100              |                             |
|------------|-------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
|            |                   | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
|            | 1000              | <b>3,20</b>       | <b>3,20</b>                 | <b>2,05</b>       | <b>2,05</b>                 | <b>1,48</b>       | <b>1,48</b>                 | <b>1,14</b>       | <b>1,14</b>                 | <b>0,91</b>       | <b>0,91</b>                 |
|            | 1500              | <b>2,72</b>       | <b>2,72</b>                 | <b>1,75</b>       | <b>1,75</b>                 | <b>1,27</b>       | <b>1,27</b>                 | <b>0,98</b>       | <b>0,98</b>                 | <b>0,78</b>       | <b>0,78</b>                 |
|            | 2000              | <b>2,37</b>       | <b>2,37</b>                 | <b>1,53</b>       | <b>1,53</b>                 | <b>1,11</b>       | <b>1,11</b>                 | <b>0,85</b>       | <b>0,85</b>                 | <b>0,68</b>       | <b>0,68</b>                 |
|            | 2500              | <b>2,09</b>       | <b>2,09</b>                 | <b>1,36</b>       | <b>1,36</b>                 | <b>0,98</b>       | <b>0,98</b>                 | <b>0,76</b>       | <b>0,76</b>                 | <b>0,60</b>       | <b>0,60</b>                 |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads | $H_{max}$<br>[mm] | 300               |                             | 500               |                             | 700               |                             | 900               |                             | 1100              |                             |
|---------------|-------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
|               |                   | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
|               | 1000              | <b>2,07</b>       | <b>2,03</b>                 | <b>1,35</b>       | <b>1,35</b>                 | <b>0,98</b>       | <b>0,98</b>                 | <b>0,76</b>       | <b>0,76</b>                 | <b>0,61</b>       | <b>0,61</b>                 |
|               | 1500              | <b>1,75</b>       | <b>1,75</b>                 | <b>1,15</b>       | <b>1,15</b>                 | <b>0,84</b>       | <b>0,84</b>                 | <b>0,65</b>       | <b>0,65</b>                 | <b>0,52</b>       | <b>0,52</b>                 |
|               | 2000              | <b>1,52</b>       | <b>1,52</b>                 | <b>1,00</b>       | <b>1,00</b>                 | <b>0,73</b>       | <b>0,73</b>                 | <b>0,57</b>       | <b>0,57</b>                 | <b>0,46</b>       | <b>0,46</b>                 |
|               | 2500              | <b>1,35</b>       | <b>1,35</b>                 | <b>0,89</b>       | <b>0,89</b>                 | <b>0,65</b>       | <b>0,65</b>                 | <b>0,50</b>       | <b>0,50</b>                 | <b>0,40</b>       | <b>0,40</b>                 |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

| 3 Point Loads | $H_{max}$<br>[mm] | 300               |                             | 500               |                             | 700               |                             | 900               |                             | 1100              |                             |
|---------------|-------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
|               |                   | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
|               | 1000              | <b>1,51</b>       | <b>1,44</b>                 | <b>0,99</b>       | <b>0,99</b>                 | <b>0,73</b>       | <b>0,73</b>                 | <b>0,56</b>       | <b>0,56</b>                 | <b>0,45</b>       | <b>0,45</b>                 |
|               | 1500              | <b>1,28</b>       | <b>1,27</b>                 | <b>0,85</b>       | <b>0,85</b>                 | <b>0,62</b>       | <b>0,62</b>                 | <b>0,48</b>       | <b>0,48</b>                 | <b>0,39</b>       | <b>0,39</b>                 |
|               | 2000              | <b>1,12</b>       | <b>1,12</b>                 | <b>0,74</b>       | <b>0,74</b>                 | <b>0,54</b>       | <b>0,54</b>                 | <b>0,42</b>       | <b>0,42</b>                 | <b>0,34</b>       | <b>0,34</b>                 |
|               | 2500              | <b>0,99</b>       | <b>0,99</b>                 | <b>0,65</b>       | <b>0,65</b>                 | <b>0,48</b>       | <b>0,48</b>                 | <b>0,37</b>       | <b>0,37</b>                 | <b>0,30</b>       | <b>0,30</b>                 |

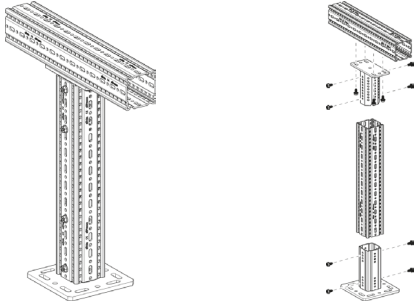
$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

All illustrated structures are able to be installed standing as well.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation H/100; L/100.

### Working loads in accordance with Eurocode 3

#### T-Support F 100



#### Part List

- 1 x End Support WBD F 100
- 2 x Beam Section TP F 100
- 1 x End Support STA F 100
- 12 x Self-Forming-Screw FLS F

| Distributed Load - symmetrical | $H_{max}$ | $q_{z,perm}$ | $F_z$ ( $q_{z,perm} * 1m$ ) |
|--------------------------------|-----------|--------------|-----------------------------|
|                                | [mm]      | [kN/m]       | [kN]                        |
|                                | 1000      | <b>13,98</b> | <b>13,98</b>                |
|                                | 1500      | <b>13,92</b> | <b>13,92</b>                |
|                                | 2000      | <b>13,86</b> | <b>13,86</b>                |
|                                | 2500      | <b>13,80</b> | <b>13,80</b>                |

$q_z$  [kN/m] as permanent load over L;  
 $L_{max} = 1.100$  mm.

| Point Load - central | $H_{max}$ | $F_{z,perm}$ for |                     |
|----------------------|-----------|------------------|---------------------|
|                      |           | $F_x = 0$        | $F_x = \mu_0 * F_z$ |
|                      | [mm]      | [kN]             | [kN]                |
|                      | 1000      | <b>12,85</b>     | <b>7,68</b>         |
|                      | 1500      | <b>12,80</b>     | <b>4,53</b>         |
|                      | 2000      | <b>12,74</b>     | <b>3,07</b>         |
|                      | 2500      | <b>12,69</b>     | <b>2,24</b>         |

$F_z$  [kN] as a permanent load;  $F_x$  [kN] as a variable load;  
 Central load introduction for planned eccentricity  $\pm 50$  mm.

| 2 Point Loads - symmetrical | $H_{max}$ | $F_{z,perm}$ for |                     |
|-----------------------------|-----------|------------------|---------------------|
|                             |           | $F_x = 0$        | $F_x = \mu_0 * F_z$ |
|                             | [mm]      | [kN]             | [kN]                |
|                             | 1000      | <b>6,98</b>      | <b>4,36</b>         |
|                             | 1500      | <b>6,95</b>      | <b>2,53</b>         |
|                             | 2000      | <b>6,92</b>      | <b>1,70</b>         |
|                             | 2500      | <b>6,89</b>      | <b>1,24</b>         |

$F_z$  [kN] as permanent loads;  $F_x$  [kN] as variable loads;  
 $L_{max} = 1.100$  mm.

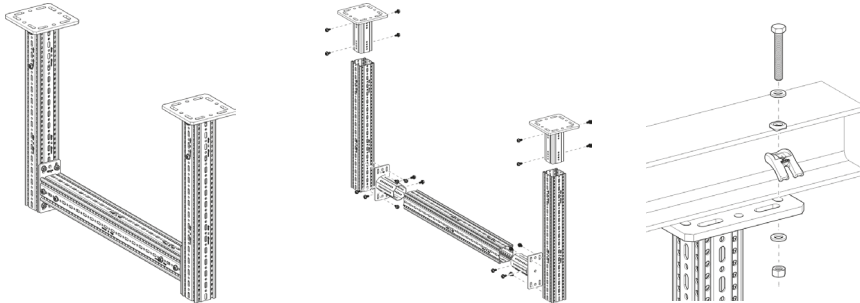
| 3 Point Loads - symmetrical | $H_{max}$ | $F_{z,perm}$ for |                     |
|-----------------------------|-----------|------------------|---------------------|
|                             |           | $F_x = 0$        | $F_x = \mu_0 * F_z$ |
|                             | [mm]      | [kN/m]           | [kN]                |
|                             | 1000      | <b>4,65</b>      | <b>2,91</b>         |
|                             | 1500      | <b>4,63</b>      | <b>1,69</b>         |
|                             | 2000      | <b>4,61</b>      | <b>1,13</b>         |
|                             | 2500      | <b>4,59</b>      | <b>0,82</b>         |

$F_z$  [kN] as permanent loads;  $F_x$  [kN] as variable loads;  
 $L_{max} = 1.100$  mm.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $H/150$ .

### Working loads in accordance with Eurocode 3

#### Frame F 100



- Part List**  
 2 x End Support WBD F 100  
 3 x Beam Section TP F 100  
 2 x End Support STA F 100  
 24 x Self-Forming-Screw FLS F

| Distributed Load |      | 1500          |                 | 2000          |                 | 2500          |                 | 3000          |                 | 3500          |                 | 4000          |                 |
|------------------|------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
|                  |      | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
| $H_{max}$        | [mm] | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            |
| 1500             | 1500 | 16,48         | 24,72           | 12,29         | 24,57           | 9,75          | 24,38           | 6,23          | 18,70           | 4,18          | 14,63           | 2,94          | 11,78           |
| 2000             | 2000 | 16,42         | 24,63           | 12,23         | 24,46           | 9,70          | 24,24           | 6,16          | 18,49           | 4,13          | 14,47           | 2,91          | 11,64           |
| 2500             | 2500 | 16,38         | 24,57           | 12,18         | 24,37           | 9,65          | 24,12           | 6,10          | 18,29           | 4,09          | 14,31           | 2,88          | 11,51           |
| 3000             | 3000 | 16,33         | 24,50           | 12,14         | 24,28           | 9,55          | 23,88           | 6,04          | 18,11           | 4,05          | 14,17           | 2,85          | 11,40           |
| 3500             | 3500 | 16,31         | 24,46           | 12,13         | 24,25           | 9,46          | 23,65           | 5,98          | 17,94           | 4,01          | 14,04           | 2,82          | 11,29           |

$q_z$  [kN/m] as permanent load over L.

| Point Load |      | 1500      |                     | 2000      |                     | 2500      |                     | 3000      |                     | 3500      |                     | 4000      |                     |
|------------|------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|
|            |      | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ |
| $H_{max}$  | [mm] | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                |
| 1500       | 1500 | 24,61     | 8,39                | 19,50     | 8,39                | 15,77     | 8,23                | 11,76     | 8,23                | 9,11      | 8,09                | 7,28      | 6,94                |
| 2000       | 2000 | 24,51     | 6,33                | 19,43     | 6,24                | 15,62     | 6,24                | 11,65     | 6,15                | 9,02      | 6,07                | 7,21      | 6,07                |
| 2500       | 2500 | 24,39     | 5,21                | 19,34     | 5,15                | 15,48     | 5,09                | 11,54     | 5,09                | 8,94      | 5,03                | 7,14      | 4,98                |
| 3000       | 3000 | 24,36     | 4,33                | 19,26     | 4,29                | 15,35     | 4,25                | 11,44     | 4,21                | 8,86      | 4,21                | 7,08      | 4,17                |
| 3500       | 3500 | 24,33     | 3,75                | 19,20     | 3,75                | 15,23     | 3,72                | 11,35     | 3,68                | 8,79      | 3,66                | 7,02      | 3,63                |

$F_z$  [kN] as a permanent load at distance L/2;  $F_x$  [kN] as a variable load at distance L/2.

| 2 Point Loads |      | 1500      |                     | 2000      |                     | 2500      |                     | 3000      |                     | 3500      |                     | 4000      |                     |
|---------------|------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|
|               |      | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ |
| $H_{max}$     | [mm] | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                |
| 1500          | 1500 | 12,32     | 4,16                | 12,22     | 4,13                | 9,29      | 4,10                | 6,96      | 4,06                | 5,41      | 4,03                | 4,33      | 3,98                |
| 2000          | 2000 | 12,27     | 3,18                | 12,15     | 3,16                | 9,19      | 3,14                | 6,89      | 3,12                | 5,35      | 3,09                | 4,28      | 3,06                |
| 2500          | 2500 | 12,23     | 2,58                | 12,11     | 2,57                | 9,10      | 2,55                | 6,82      | 2,53                | 5,30      | 2,51                | 4,24      | 2,49                |
| 3000          | 3000 | 12,21     | 2,17                | 12,05     | 2,16                | 9,02      | 2,15                | 6,76      | 2,13                | 5,25      | 2,12                | 4,20      | 2,10                |
| 3500          | 3500 | 12,19     | 1,87                | 12,03     | 1,86                | 8,94      | 1,86                | 6,70      | 1,84                | 5,20      | 1,83                | 4,16      | 1,82                |

$F_z$  [kN] as permanent loads at distance  $2*L/3$  and  $L/3$ ;  $F_x$  [kN] as variable loads at distance  $2*L/3$  and  $L/3$ .

| 3 Point Loads |      | 1500      |                     | 2000      |                     | 2500      |                     | 3000      |                     | 3500      |                     | 4000      |                     |
|---------------|------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|
|               |      | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ |
| $H_{max}$     | [mm] | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                |
| 1500          | 1500 | 8,22      | 2,77                | 8,16      | 2,75                | 6,62      | 2,73                | 4,97      | 2,71                | 3,87      | 2,69                | 3,11      | 2,66                |
| 2000          | 2000 | 8,19      | 2,12                | 8,11      | 2,11                | 6,55      | 2,10                | 4,92      | 2,08                | 3,83      | 2,06                | 3,07      | 2,05                |
| 2500          | 2500 | 8,16      | 1,72                | 8,08      | 1,71                | 6,48      | 1,70                | 4,87      | 1,69                | 3,79      | 1,68                | 3,04      | 1,66                |
| 3000          | 3000 | 8,14      | 1,45                | 8,05      | 1,44                | 6,42      | 1,43                | 4,83      | 1,42                | 3,76      | 1,41                | 3,01      | 1,40                |
| 3500          | 3500 | 8,13      | 1,25                | 8,03      | 1,24                | 6,37      | 1,24                | 4,79      | 1,23                | 3,72      | 1,22                | 2,98      | 1,21                |

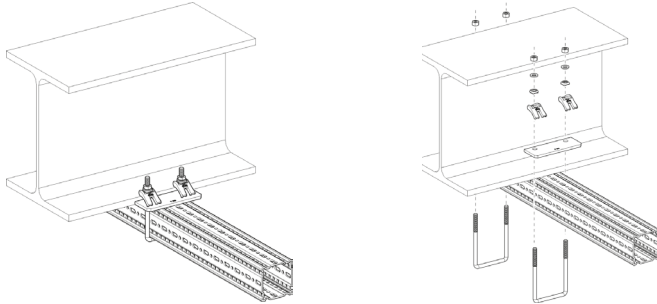
$F_z$  [kN] as permanent loads at distance  $3*L/4$ ,  $L/2$  and  $L/4$ ;  $F_x$  [kN] as variable loads at distance  $3*L/4$ ,  $L/2$  and  $L/4$ .

All illustrated structures are able to be installed standing as well.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $H/100$ ;  $L/200$ .

## Working loads in accordance with Eurocode 3

### Joining Beam Bracket F 100 horizontal



**Part List**

- 1 x Beam Section TP F 100
- 2 x U-Holder SB F 100-40

| Distributed Load | B         | 100           |                 | 150           |                 | 200           |                 | 250           |                 | 300           |                 |
|------------------|-----------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
|                  |           | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
|                  | $L_{max}$ | [mm]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN]            |
|                  | 300       | <b>14,39</b>  | <b>4,32</b>     | <b>20,42</b>  | <b>6,13</b>     | <b>24,82</b>  | <b>7,45</b>     | <b>28,17</b>  | <b>8,45</b>     | <b>30,81</b>  | <b>9,24</b>     |
|                  | 500       | <b>5,64</b>   | <b>2,82</b>     | <b>8,38</b>   | <b>4,19</b>     | <b>10,53</b>  | <b>5,26</b>     | <b>12,27</b>  | <b>6,13</b>     | <b>13,70</b>  | <b>6,85</b>     |
|                  | 700       | <b>3,02</b>   | <b>2,12</b>     | <b>4,62</b>   | <b>3,23</b>     | <b>5,93</b>   | <b>4,15</b>     | <b>7,03</b>   | <b>4,92</b>     | <b>7,96</b>   | <b>5,58</b>     |
|                  | 900       | <b>1,88</b>   | <b>1,69</b>     | <b>2,93</b>   | <b>2,64</b>     | <b>3,82</b>   | <b>3,44</b>     | <b>4,59</b>   | <b>4,13</b>     | <b>5,26</b>   | <b>4,73</b>     |
|                  | 1100      | <b>1,28</b>   | <b>1,41</b>     | <b>2,02</b>   | <b>2,22</b>     | <b>2,67</b>   | <b>2,94</b>     | <b>3,24</b>   | <b>3,56</b>     | <b>3,74</b>   | <b>4,12</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load | B         | 100                         |                                       | 150                         |                                       | 200                         |                                       | 250                         |                                       | 300                         |                                       |
|------------|-----------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|
|            |           | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ |
|            | $L_{max}$ | [mm]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  |
|            | 300       | <b>2,36</b>                 | <b>1,12</b>                           | <b>3,51</b>                 | <b>1,67</b>                           | <b>4,43</b>                 | <b>2,10</b>                           | <b>5,17</b>                 | <b>2,45</b>                           | <b>5,79</b>                 | <b>2,75</b>                           |
|            | 500       | <b>1,55</b>                 | <b>0,74</b>                           | <b>2,41</b>                 | <b>1,14</b>                           | <b>3,14</b>                 | <b>1,49</b>                           | <b>3,77</b>                 | <b>1,79</b>                           | <b>4,32</b>                 | <b>2,05</b>                           |
|            | 700       | <b>1,16</b>                 | <b>0,55</b>                           | <b>1,83</b>                 | <b>0,87</b>                           | <b>2,43</b>                 | <b>1,15</b>                           | <b>2,96</b>                 | <b>1,41</b>                           | <b>3,44</b>                 | <b>1,63</b>                           |
|            | 900       | <b>0,92</b>                 | <b>0,44</b>                           | <b>1,48</b>                 | <b>0,70</b>                           | <b>1,98</b>                 | <b>0,94</b>                           | <b>2,44</b>                 | <b>1,16</b>                           | <b>2,86</b>                 | <b>1,36</b>                           |
|            | 1100      | <b>0,77</b>                 | <b>0,36</b>                           | <b>1,24</b>                 | <b>0,59</b>                           | <b>1,67</b>                 | <b>0,79</b>                           | <b>2,08</b>                 | <b>0,99</b>                           | <b>2,45</b>                 | <b>1,16</b>                           |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads | B         | 100                         |                                       | 150                         |                                       | 200                         |                                       | 250                         |                                       | 300                         |                                       |
|---------------|-----------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|
|               |           | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ |
|               | $L_{max}$ | [mm]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  |
|               | 300       | <b>1,46</b>                 | <b>0,69</b>                           | <b>2,12</b>                 | <b>1,01</b>                           | <b>2,62</b>                 | <b>1,24</b>                           | <b>3,01</b>                 | <b>1,43</b>                           | <b>3,32</b>                 | <b>1,57</b>                           |
|               | 500       | <b>0,98</b>                 | <b>0,47</b>                           | <b>1,50</b>                 | <b>0,71</b>                           | <b>1,92</b>                 | <b>0,91</b>                           | <b>2,27</b>                 | <b>1,08</b>                           | <b>2,57</b>                 | <b>1,22</b>                           |
|               | 700       | <b>0,74</b>                 | <b>0,35</b>                           | <b>1,16</b>                 | <b>0,55</b>                           | <b>1,51</b>                 | <b>0,72</b>                           | <b>1,82</b>                 | <b>0,86</b>                           | <b>2,09</b>                 | <b>0,99</b>                           |
|               | 900       | <b>0,60</b>                 | <b>0,28</b>                           | <b>0,94</b>                 | <b>0,45</b>                           | <b>1,25</b>                 | <b>0,59</b>                           | <b>1,52</b>                 | <b>0,72</b>                           | <b>1,76</b>                 | <b>0,84</b>                           |
|               | 1100      | <b>0,50</b>                 | <b>0,24</b>                           | <b>0,79</b>                 | <b>0,38</b>                           | <b>1,06</b>                 | <b>0,50</b>                           | <b>1,30</b>                 | <b>0,62</b>                           | <b>1,53</b>                 | <b>0,72</b>                           |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

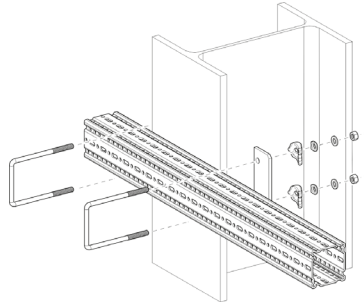
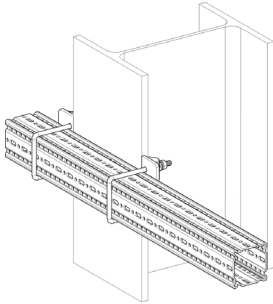
| 3 Point Loads | B         | 100                         |                                       | 150                         |                                       | 200                         |                                       | 250                         |                                       | 300                         |                                       |
|---------------|-----------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|
|               |           | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ |
|               | $L_{max}$ | [mm]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  |
|               | 300       | <b>1,06</b>                 | <b>0,50</b>                           | <b>1,52</b>                 | <b>0,72</b>                           | <b>1,86</b>                 | <b>0,88</b>                           | <b>2,12</b>                 | <b>1,00</b>                           | <b>2,33</b>                 | <b>1,10</b>                           |
|               | 500       | <b>0,72</b>                 | <b>0,34</b>                           | <b>1,08</b>                 | <b>0,52</b>                           | <b>1,38</b>                 | <b>0,65</b>                           | <b>1,62</b>                 | <b>0,77</b>                           | <b>1,82</b>                 | <b>0,87</b>                           |
|               | 700       | <b>0,55</b>                 | <b>0,26</b>                           | <b>0,84</b>                 | <b>0,40</b>                           | <b>1,10</b>                 | <b>0,52</b>                           | <b>1,31</b>                 | <b>0,62</b>                           | <b>1,50</b>                 | <b>0,71</b>                           |
|               | 900       | <b>0,44</b>                 | <b>0,21</b>                           | <b>0,69</b>                 | <b>0,33</b>                           | <b>0,91</b>                 | <b>0,43</b>                           | <b>1,10</b>                 | <b>0,52</b>                           | <b>1,27</b>                 | <b>0,61</b>                           |
|               | 1100      | <b>0,37</b>                 | <b>0,18</b>                           | <b>0,58</b>                 | <b>0,28</b>                           | <b>0,78</b>                 | <b>0,37</b>                           | <b>0,95</b>                 | <b>0,45</b>                           | <b>1,11</b>                 | <b>0,53</b>                           |

$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation L/100.

## Working loads in accordance with Eurocode 3

### Joining Beam Bracket F 100 vertical



**Part List**  
 1 x Beam Section TP F 100  
 2 x U-Holder SB F 100-40

| Distributed Load |      | 100          |                 | 150          |                 | 200          |                 | 250          |                 | 300          |                 |
|------------------|------|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|
|                  |      | $q_{z,perm}$ | $F_z (q_z * L)$ | $q_{z,perm}$ | $F_z (q_z * L)$ | $q_{z,perm}$ | $F_z (q_z * L)$ | $q_{z,perm}$ | $F_z (q_z * L)$ | $q_{z,perm}$ | $F_z (q_z * L)$ |
| $L_{max}$        | [mm] | [kN/m]       | [kN]            | [kN/m]       | [kN]            | [kN/m]       | [kN]            | [kN/m]       | [kN]            | [kN/m]       | [kN]            |
|                  | 300  | <b>3,21</b>  | <b>0,96</b>     | <b>4,46</b>  | <b>1,34</b>     | <b>5,34</b>  | <b>1,60</b>     | <b>5,99</b>  | <b>1,80</b>     | <b>6,49</b>  | <b>1,95</b>     |
|                  | 500  | <b>1,36</b>  | <b>0,68</b>     | <b>1,98</b>  | <b>0,99</b>     | <b>2,47</b>  | <b>1,23</b>     | <b>2,86</b>  | <b>1,43</b>     | <b>3,17</b>  | <b>1,58</b>     |
|                  | 700  | <b>0,75</b>  | <b>0,52</b>     | <b>1,13</b>  | <b>0,79</b>     | <b>1,44</b>  | <b>1,00</b>     | <b>1,69</b>  | <b>1,18</b>     | <b>1,91</b>  | <b>1,34</b>     |
|                  | 900  | <b>0,47</b>  | <b>0,43</b>     | <b>0,73</b>  | <b>0,65</b>     | <b>0,94</b>  | <b>0,85</b>     | <b>1,12</b>  | <b>1,01</b>     | <b>1,28</b>  | <b>1,15</b>     |
|                  | 1100 | <b>0,33</b>  | <b>0,36</b>     | <b>0,51</b>  | <b>0,56</b>     | <b>0,67</b>  | <b>0,73</b>     | <b>0,80</b>  | <b>0,88</b>     | <b>0,92</b>  | <b>1,02</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load |      | 100                        |                     | 150                        |                     | 200                        |                     | 250                        |                     | 300                        |                     |
|------------|------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|
|            |      | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ |
| $L_{max}$  | [mm] | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                |
|            | 300  | <b>0,59</b>                | <b>0,56</b>         | <b>0,88</b>                | <b>0,84</b>         | <b>1,11</b>                | <b>1,06</b>         | <b>1,29</b>                | <b>1,24</b>         | <b>1,45</b>                | <b>1,39</b>         |
|            | 500  | <b>0,39</b>                | <b>0,37</b>         | <b>0,60</b>                | <b>0,58</b>         | <b>0,79</b>                | <b>0,75</b>         | <b>0,94</b>                | <b>0,90</b>         | <b>1,08</b>                | <b>1,03</b>         |
|            | 700  | <b>0,29</b>                | <b>0,28</b>         | <b>0,46</b>                | <b>0,44</b>         | <b>0,61</b>                | <b>0,58</b>         | <b>0,74</b>                | <b>0,71</b>         | <b>0,86</b>                | <b>0,83</b>         |
|            | 900  | <b>0,23</b>                | <b>0,22</b>         | <b>0,37</b>                | <b>0,35</b>         | <b>0,50</b>                | <b>0,48</b>         | <b>0,61</b>                | <b>0,59</b>         | <b>0,72</b>                | <b>0,69</b>         |
|            | 1100 | <b>0,19</b>                | <b>0,18</b>         | <b>0,31</b>                | <b>0,30</b>         | <b>0,42</b>                | <b>0,40</b>         | <b>0,52</b>                | <b>0,50</b>         | <b>0,61</b>                | <b>0,59</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads |      | 100                        |                     | 150                        |                     | 200                        |                     | 250                        |                     | 300                        |                     |
|---------------|------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|
|               |      | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ |
| $L_{max}$     | [mm] | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                |
|               | 300  | <b>0,37</b>                | <b>0,35</b>         | <b>0,53</b>                | <b>0,51</b>         | <b>0,65</b>                | <b>0,63</b>         | <b>0,75</b>                | <b>0,72</b>         | <b>0,83</b>                | <b>0,80</b>         |
|               | 500  | <b>0,25</b>                | <b>0,24</b>         | <b>0,37</b>                | <b>0,36</b>         | <b>0,48</b>                | <b>0,46</b>         | <b>0,57</b>                | <b>0,54</b>         | <b>0,64</b>                | <b>0,62</b>         |
|               | 700  | <b>0,19</b>                | <b>0,18</b>         | <b>0,29</b>                | <b>0,28</b>         | <b>0,38</b>                | <b>0,36</b>         | <b>0,46</b>                | <b>0,44</b>         | <b>0,52</b>                | <b>0,50</b>         |
|               | 900  | <b>0,15</b>                | <b>0,14</b>         | <b>0,24</b>                | <b>0,23</b>         | <b>0,31</b>                | <b>0,30</b>         | <b>0,38</b>                | <b>0,36</b>         | <b>0,44</b>                | <b>0,42</b>         |
|               | 1100 | <b>0,13</b>                | <b>0,12</b>         | <b>0,20</b>                | <b>0,19</b>         | <b>0,27</b>                | <b>0,26</b>         | <b>0,33</b>                | <b>0,31</b>         | <b>0,38</b>                | <b>0,37</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

| 3 Point Loads |      | 100                        |                     | 150                        |                     | 200                        |                     | 250                        |                     | 300                        |                     |
|---------------|------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|----------------------------|---------------------|
|               |      | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_{z,perm}$ for $F_x = 0$ | $F_x = \mu_0 * F_z$ |
| $L_{max}$     | [mm] | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                | [kN]                       | [kN]                |
|               | 300  | <b>0,27</b>                | <b>0,25</b>         | <b>0,38</b>                | <b>0,36</b>         | <b>0,46</b>                | <b>0,45</b>         | <b>0,53</b>                | <b>0,51</b>         | <b>0,58</b>                | <b>0,56</b>         |
|               | 500  | <b>0,18</b>                | <b>0,17</b>         | <b>0,27</b>                | <b>0,26</b>         | <b>0,35</b>                | <b>0,33</b>         | <b>0,41</b>                | <b>0,39</b>         | <b>0,46</b>                | <b>0,44</b>         |
|               | 700  | <b>0,14</b>                | <b>0,13</b>         | <b>0,21</b>                | <b>0,20</b>         | <b>0,28</b>                | <b>0,26</b>         | <b>0,33</b>                | <b>0,32</b>         | <b>0,38</b>                | <b>0,36</b>         |
|               | 900  | <b>0,11</b>                | <b>0,11</b>         | <b>0,17</b>                | <b>0,17</b>         | <b>0,23</b>                | <b>0,22</b>         | <b>0,28</b>                | <b>0,27</b>         | <b>0,32</b>                | <b>0,31</b>         |
|               | 1100 | <b>0,09</b>                | <b>0,09</b>         | <b>0,15</b>                | <b>0,14</b>         | <b>0,20</b>                | <b>0,19</b>         | <b>0,24</b>                | <b>0,23</b>         | <b>0,28</b>                | <b>0,27</b>         |

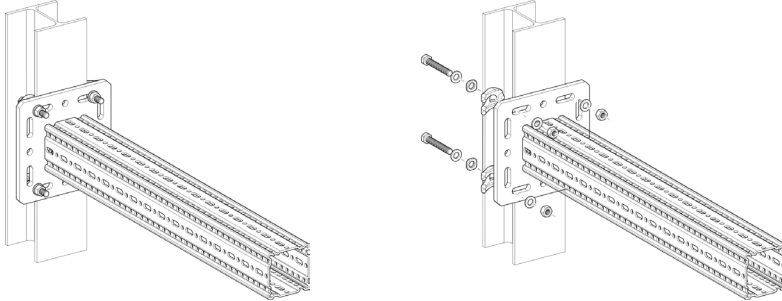
$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation L/100.



### Working loads in accordance with Eurocode 3

#### Beam Bracket F 100 - Variante a) clamped



#### Part List

- 1 x Beam Bracket TKO F 100
- 1 x Assembly Set MS 5P M12 S

| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} * L)$ |
|------------------|-----------|---------------|-------------------------|
|                  | [mm]      | [kN/m]        | [kN]                    |
|                  | 300       | <b>54,99</b>  | <b>16,50</b>            |
|                  | 500       | <b>28,59</b>  | <b>14,30</b>            |
|                  | 700       | <b>14,59</b>  | <b>10,21</b>            |
|                  | 900       | <b>8,83</b>   | <b>7,94</b>             |
|                  | 1100      | <b>5,91</b>   | <b>6,50</b>             |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | $F_{z, perm}$ for |                     |
|------------|-----------|-------------------|---------------------|
|            |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|            | [mm]      | [kN]              | [kN]                |
|            | 300       | <b>11,91</b>      | <b>7,40</b>         |
|            | 500       | <b>7,15</b>       | <b>4,44</b>         |
|            | 700       | <b>5,11</b>       | <b>3,17</b>         |
|            | 900       | <b>3,97</b>       | <b>2,47</b>         |
|            | 1100      | <b>3,25</b>       | <b>2,02</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]      | [kN]              | [kN]                |
|               | 300       | <b>7,94</b>       | <b>4,93</b>         |
|               | 500       | <b>4,77</b>       | <b>2,96</b>         |
|               | 700       | <b>3,40</b>       | <b>2,11</b>         |
|               | 900       | <b>2,65</b>       | <b>1,64</b>         |
|               | 1100      | <b>2,17</b>       | <b>1,34</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

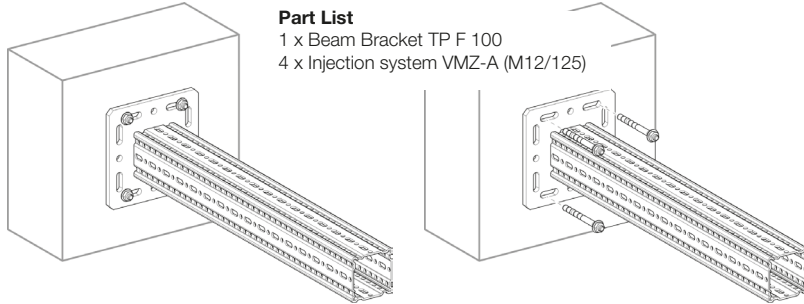
| 3 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]      | [kN/m]            | [kN]                |
|               | 300       | <b>5,96</b>       | <b>3,70</b>         |
|               | 500       | <b>3,57</b>       | <b>2,22</b>         |
|               | 700       | <b>2,55</b>       | <b>1,58</b>         |
|               | 900       | <b>1,99</b>       | <b>1,23</b>         |
|               | 1100      | <b>1,62</b>       | <b>1,01</b>         |

$F_z$  [kN] as permanent loads at distance L,  $2*L/3$  and  $L/3$ ;  $F_x$  [kN] as variable loads at distance L,  $2*L/3$  and  $L/3$ .

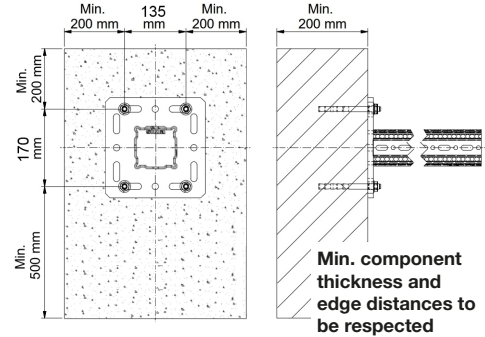
Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $L/100$ .

### Working loads in accordance with Eurocode 3

#### Beam Bracket F 100 - Variante b) anchored



**Part List**  
 1 x Beam Bracket TP F 100  
 4 x Injection system VMZ-A (M12/125)



| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} * L)$ |
|------------------|-----------|---------------|-------------------------|
|                  | [mm]      | [kN/m]        | [kN]                    |
|                  | 300       | <b>42,31</b>  | <b>12,69</b>            |
|                  | 500       | <b>21,76</b>  | <b>10,88</b>            |
|                  | 700       | <b>13,61</b>  | <b>9,52</b>             |
|                  | 900       | <b>9,41</b>   | <b>8,47</b>             |
|                  | 1100      | <b>6,93</b>   | <b>7,62</b>             |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | $F_{z, perm}$ for |                     |
|------------|-----------|-------------------|---------------------|
|            |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|            | [mm]      | [kN]              | [kN]                |
|            | 300       | <b>10,16</b>      | <b>10,16</b>        |
|            | 500       | <b>8,02</b>       | <b>8,02</b>         |
|            | 700       | <b>6,63</b>       | <b>6,63</b>         |
|            | 900       | <b>5,33</b>       | <b>5,33</b>         |
|            | 1100      | <b>4,35</b>       | <b>4,35</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]      | [kN]              | [kN]                |
|               | 300       | <b>5,64</b>       | <b>5,64</b>         |
|               | 500       | <b>4,62</b>       | <b>4,62</b>         |
|               | 700       | <b>3,91</b>       | <b>3,91</b>         |
|               | 900       | <b>3,39</b>       | <b>3,39</b>         |
|               | 1100      | <b>2,90</b>       | <b>2,90</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

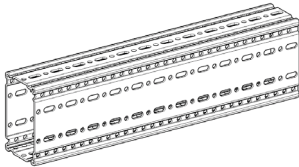
| 3 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]      | [kN/m]            | [kN]                |
|               | 300       | <b>3,91</b>       | <b>3,91</b>         |
|               | 500       | <b>3,24</b>       | <b>3,24</b>         |
|               | 700       | <b>2,77</b>       | <b>2,77</b>         |
|               | 900       | <b>2,42</b>       | <b>2,42</b>         |
|               | 1100      | <b>2,15</b>       | <b>2,15</b>         |

$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

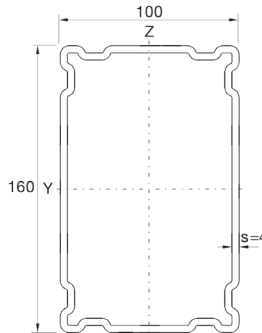
Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation L/100.

### Working loads in accordance with Eurocode 3

#### Beam Section TP F 100/160



Single-span beam with uniaxial load  
dead weight of the profile is considered



| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
|------------------|-----------|---------------|-----------------|
|                  | [mm]      | [kN/m]        | [kN]            |
|                  | 1000      | <b>112,43</b> | <b>112,43</b>   |
|                  | 2000      | <b>35,94</b>  | <b>71,89</b>    |
|                  | 3000      | <b>15,88</b>  | <b>47,65</b>    |
|                  | 4000      | <b>7,05</b>   | <b>28,19</b>    |
|                  | 5000      | <b>3,61</b>   | <b>18,04</b>    |
|                  | 6000      | <b>2,09</b>   | <b>12,53</b>    |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | $F_{z, perm}$ |
|------------|-----------|---------------|
|            | [mm]      | [N]           |
|            | 1000      | <b>72,13</b>  |
|            | 2000      | <b>35,94</b>  |
|            | 3000      | <b>23,82</b>  |
|            | 4000      | <b>17,62</b>  |
|            | 5000      | <b>11,28</b>  |
|            | 6000      | <b>7,83</b>   |

$F_z$  [kN] as a permanent load at L/2.

| 2 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [N]           |
|               | 1000      | <b>54,10</b>  |
|               | 2000      | <b>26,96</b>  |
|               | 3000      | <b>17,87</b>  |
|               | 4000      | <b>10,34</b>  |
|               | 5000      | <b>6,62</b>   |
|               | 6000      | <b>4,60</b>   |

$F_z$  [kN] as permanent loads at L/3 and 2\*L/3.

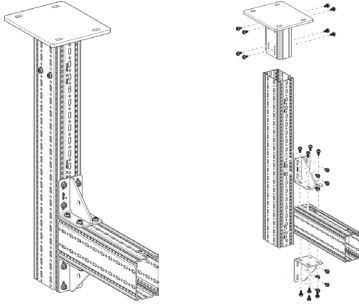
| 3 Point Loads | $L_{max}$ | $F_{z, perm}$ |
|---------------|-----------|---------------|
|               | [mm]      | [N]           |
|               | 1000      | <b>36,07</b>  |
|               | 2000      | <b>17,97</b>  |
|               | 3000      | <b>11,91</b>  |
|               | 4000      | <b>7,42</b>   |
|               | 5000      | <b>4,75</b>   |
|               | 6000      | <b>3,30</b>   |

$F_z$  [kN] as permanent loads at L/4, L/2 and 3\*L/4.

Max. bending L/200.

## Working loads in accordance with Eurocode 3

### L-Construction F 100/160



#### Part List

- 1 x End Support WBD F 100/160
- 2 x Beam Section TP F 100/160
- 2 x Corner Bracket WD F 100 140/140
- 24 x Self-Forming-Screw FLS F

| Distributed Load |      | 300           |                 | 500           |                 | 700           |                 | 900           |                 | 1100          |                 |
|------------------|------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
|                  |      | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
| $H_{max}$        | [mm] | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            |
|                  | 2000 | <b>23,30</b>  | <b>6,99</b>     | <b>9,91</b>   | <b>4,96</b>     | <b>5,40</b>   | <b>3,78</b>     | <b>3,36</b>   | <b>3,02</b>     | <b>2,27</b>   | <b>2,49</b>     |
|                  | 2500 | <b>21,42</b>  | <b>6,43</b>     | <b>9,15</b>   | <b>4,58</b>     | <b>4,99</b>   | <b>3,49</b>     | <b>3,11</b>   | <b>2,79</b>     | <b>2,10</b>   | <b>2,31</b>     |
|                  | 3000 | <b>19,82</b>  | <b>5,94</b>     | <b>8,50</b>   | <b>4,25</b>     | <b>4,64</b>   | <b>3,25</b>     | <b>2,89</b>   | <b>2,60</b>     | <b>1,95</b>   | <b>2,14</b>     |
|                  | 3500 | <b>18,43</b>  | <b>5,53</b>     | <b>7,93</b>   | <b>3,96</b>     | <b>4,33</b>   | <b>3,03</b>     | <b>2,70</b>   | <b>2,43</b>     | <b>1,82</b>   | <b>2,00</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load |      | 300         |                     | 500         |                     | 700         |                     | 900         |                     | 1100        |                     |
|------------|------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|
|            |      | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ |
| $H_{max}$  | [mm] | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                |
|            | 2000 | <b>4,04</b> | <b>3,10</b>         | <b>2,71</b> | <b>2,71</b>         | <b>2,01</b> | <b>2,01</b>         | <b>1,58</b> | <b>1,58</b>         | <b>1,29</b> | <b>1,29</b>         |
|            | 2500 | <b>3,72</b> | <b>2,63</b>         | <b>2,51</b> | <b>2,38</b>         | <b>1,87</b> | <b>1,87</b>         | <b>1,47</b> | <b>1,47</b>         | <b>1,20</b> | <b>1,20</b>         |
|            | 3000 | <b>3,46</b> | <b>2,28</b>         | <b>2,34</b> | <b>2,09</b>         | <b>1,74</b> | <b>1,74</b>         | <b>1,37</b> | <b>1,37</b>         | <b>1,12</b> | <b>1,12</b>         |
|            | 3500 | <b>3,23</b> | <b>2,02</b>         | <b>2,19</b> | <b>1,87</b>         | <b>1,63</b> | <b>1,63</b>         | <b>1,28</b> | <b>1,28</b>         | <b>1,04</b> | <b>1,04</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

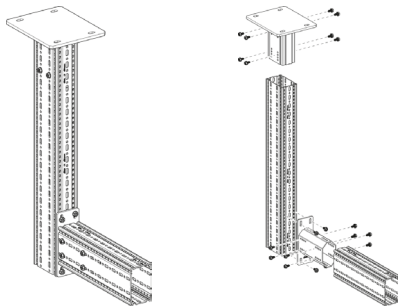
| 2 Point Loads |      | 300         |                     | 500         |                     | 700         |                     | 900         |                     | 1100        |                     |
|---------------|------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|
|               |      | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ |
| $H_{max}$     | [mm] | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                |
|               | 2000 | <b>2,56</b> | <b>1,62</b>         | <b>1,76</b> | <b>1,48</b>         | <b>1,32</b> | <b>1,32</b>         | <b>1,04</b> | <b>1,04</b>         | <b>0,85</b> | <b>0,85</b>         |
|               | 2500 | <b>2,36</b> | <b>1,37</b>         | <b>1,62</b> | <b>1,26</b>         | <b>1,22</b> | <b>1,170</b>        | <b>0,96</b> | <b>0,96</b>         | <b>0,79</b> | <b>0,79</b>         |
|               | 3000 | <b>2,19</b> | <b>1,18</b>         | <b>1,51</b> | <b>1,10</b>         | <b>1,13</b> | <b>1,03</b>         | <b>0,90</b> | <b>0,90</b>         | <b>0,73</b> | <b>0,73</b>         |
|               | 3500 | <b>2,04</b> | <b>1,04</b>         | <b>1,41</b> | <b>0,98</b>         | <b>1,06</b> | <b>0,92</b>         | <b>0,84</b> | <b>0,84</b>         | <b>0,69</b> | <b>0,69</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

| 3 Point Loads |      | $L_{max}$   | 300                 |             | 500                 |             | 700                 |             | 900                 |             | 1100                |             |
|---------------|------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|
|               |      |             | $F_{z, perm}$ for   |             | $F_{z, perm}$ for   |             | $F_{z, perm}$ for   |             | $F_{z, perm}$ for   |             | $F_{z, perm}$ for   |             |
| $H_{max}$     | [mm] | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ |             |
|               |      | 2000        |                     | <b>1,86</b> | <b>1,10</b>         | <b>1,28</b> | <b>1,01</b>         | <b>0,96</b> | <b>0,93</b>         | <b>0,76</b> | <b>0,76</b>         | <b>0,63</b> |
| 2500          |      | <b>1,71</b> | <b>0,92</b>         | <b>1,18</b> | <b>0,86</b>         | <b>0,89</b> | <b>0,80</b>         | <b>0,71</b> | <b>0,71</b>         | <b>0,58</b> | <b>0,58</b>         |             |
| 3000          |      | <b>1,59</b> | <b>0,80</b>         | <b>1,10</b> | <b>0,75</b>         | <b>0,83</b> | <b>0,70</b>         | <b>0,66</b> | <b>0,66</b>         | <b>0,54</b> | <b>0,54</b>         |             |
| 3500          |      | <b>1,48</b> | <b>0,70</b>         | <b>1,03</b> | <b>0,66</b>         | <b>0,78</b> | <b>0,63</b>         | <b>0,62</b> | <b>0,59</b>         | <b>0,51</b> | <b>0,51</b>         |             |

$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

For assembly with STA F 100 - 100/160 the loads have to be reduced by 10 % reduction ratio  $F_z$ .



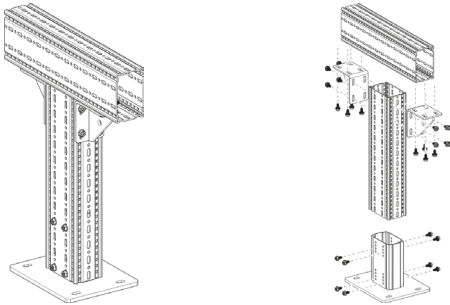
### Part List

- 1 x End Support WBD F 100/160
- 2 x Beam Section TP F 100/160
- 1 x End Support STA F 100 - 100/160
- 20 x Self-Forming-Screw FLS F

All illustrated structures are able to be installed standing as well.  
Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $H/100$ ;  $L/100$ .

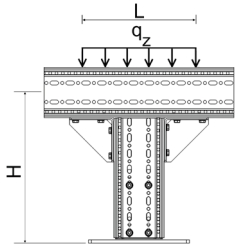
### Working loads in accordance with Eurocode 3

#### T-Support F 100/160

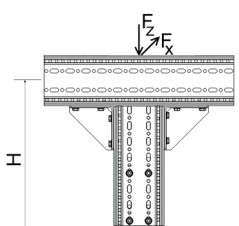


#### Part List

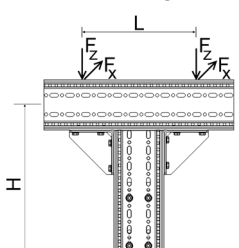
- 1 x End Support WBD F 100/160
- 2 x Beam Section TP F 100/160
- 2 x Corner Bracket WD F 100
- 24 x Self-Forming-Screw FLS F

| Distributed Load - symmetrical                                                     |  | $H_{max}$ | $q_{z, perm}$ | $F_z (q_{z, perm} * 1m)$ |
|------------------------------------------------------------------------------------|--|-----------|---------------|--------------------------|
|  |  | [mm]      | [kN/m]        | [kN]                     |
|                                                                                    |  | 2000      | <b>15,89</b>  | <b>15,89</b>             |
|                                                                                    |  | 2500      | <b>15,81</b>  | <b>15,81</b>             |
|                                                                                    |  | 3000      | <b>15,73</b>  | <b>15,73</b>             |
|                                                                                    |  | 3500      | <b>15,65</b>  | <b>15,65</b>             |
| $q_z$ [kN/m] as permanent load over L; $L_{max} = 1.100$ mm.                       |  |           |               |                          |

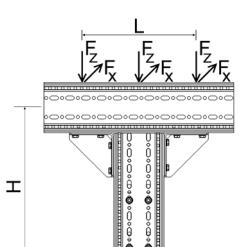
  

| Point Load - central                                                                                                              |  | $H_{max}$ | $F_{z, perm}$ for |                     |
|-----------------------------------------------------------------------------------------------------------------------------------|--|-----------|-------------------|---------------------|
|                                                |  | [mm]      | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                                                                                                                   |  | 2000      | [kN]              | [kN]                |
|                                                                                                                                   |  | 2500      | <b>15,27</b>      | <b>3,35</b>         |
|                                                                                                                                   |  | 3000      | <b>15,19</b>      | <b>2,52</b>         |
|                                                                                                                                   |  | 3500      | <b>15,11</b>      | <b>1,98</b>         |
|                                                                                                                                   |  | 3500      | <b>15,04</b>      | <b>1,61</b>         |
| $F_z$ [kN] as a permanent load; $F_x$ [kN] as a variable load;<br>Central load introduction for planned eccentricity $\pm 50$ mm. |  |           |                   |                     |

| 2 Point Loads - symmetrical                                                         |  | $H_{max}$ | $F_{z, perm}$ for |                     |
|-------------------------------------------------------------------------------------|--|-----------|-------------------|---------------------|
|  |  | [mm]      | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                                                                     |  | 2000      | [kN]              | [kN]                |
|                                                                                     |  | 2500      | <b>7,93</b>       | <b>1,75</b>         |
|                                                                                     |  | 3000      | <b>7,89</b>       | <b>1,30</b>         |
|                                                                                     |  | 3500      | <b>7,85</b>       | <b>1,02</b>         |
|                                                                                     |  | 3500      | <b>7,81</b>       | <b>0,82</b>         |
| $F_z$ [kN] as permanent loads; $F_x$ [kN] as variable loads; $L_{max} = 1.100$ mm.  |  |           |                   |                     |

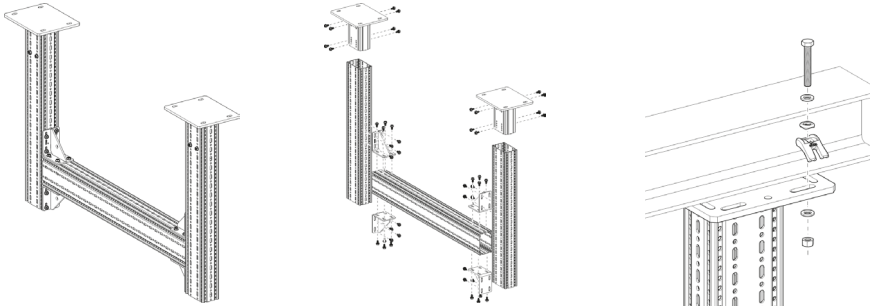
  

| 3 Point Loads - symmetrical                                                         |  | $H_{max}$ | $F_{z, perm}$ for |                     |
|-------------------------------------------------------------------------------------|--|-----------|-------------------|---------------------|
|  |  | [mm]      | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                                                                     |  | 2000      | [kN/m]            | [kN]                |
|                                                                                     |  | 2500      | <b>5,29</b>       | <b>1,17</b>         |
|                                                                                     |  | 3000      | <b>5,26</b>       | <b>0,87</b>         |
|                                                                                     |  | 3500      | <b>5,23</b>       | <b>0,68</b>         |
|                                                                                     |  | 3500      | <b>5,21</b>       | <b>0,55</b>         |
| $F_z$ [kN] as permanent loads; $F_x$ [kN] as variable loads; $L_{max} = 1.100$ mm.  |  |           |                   |                     |

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation  $H/150$ .

### Working loads in accordance with Eurocode 3

#### Frame F 100/160



**Part List**

- 2 x End Support WBD F 100/160
- 3 x Beam Section TP F 100/160
- 4 x Corner Bracket WD F 100
- 48 x Self-Forming-Screw FLS F

| Distributed Load | $L_{max}$ | 1500         |               | 2000            |               | 2500            |               | 3000            |               | 3500            |               | 4000            |               |                 |
|------------------|-----------|--------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
|                  |           | $H_{max}$    | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
|                  |           | [mm]         | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            |
|                  | 2000      | <b>26,71</b> | <b>32,58</b>  | <b>18,80</b>    | <b>32,34</b>  | <b>14,45</b>    | <b>32,07</b>  | <b>11,69</b>    | <b>31,79</b>  | <b>9,78</b>     | <b>31,50</b>  | <b>8,26</b>     | <b>30,72</b>  |                 |
|                  | 2500      | <b>26,49</b> | <b>32,31</b>  | <b>18,63</b>    | <b>32,04</b>  | <b>14,30</b>    | <b>31,74</b>  | <b>11,55</b>    | <b>31,42</b>  | <b>9,65</b>     | <b>31,09</b>  | <b>8,26</b>     | <b>30,74</b>  |                 |
|                  | 3000      | <b>26,29</b> | <b>32,07</b>  | <b>18,48</b>    | <b>31,78</b>  | <b>14,17</b>    | <b>31,45</b>  | <b>11,43</b>    | <b>31,10</b>  | <b>9,55</b>     | <b>30,74</b>  | <b>8,16</b>     | <b>30,36</b>  |                 |
|                  | 3500      | <b>26,11</b> | <b>31,85</b>  | <b>18,34</b>    | <b>31,54</b>  | <b>14,05</b>    | <b>31,19</b>  | <b>11,33</b>    | <b>30,82</b>  | <b>9,45</b>     | <b>30,43</b>  | <b>8,07</b>     | <b>30,03</b>  |                 |
|                  | 4000      | <b>25,94</b> | <b>31,64</b>  | <b>18,21</b>    | <b>31,32</b>  | <b>13,95</b>    | <b>30,96</b>  | <b>11,24</b>    | <b>30,58</b>  | <b>9,37</b>     | <b>30,18</b>  | <b>7,93</b>     | <b>29,51</b>  |                 |

$q_z$  [kN/m] as permanent load over L.

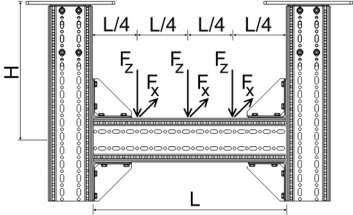
| Point Load | $L_{max}$ | 1500         |                                                   | 2000         |                                                   | 2500         |                                                   | 3000         |                                                   | 3500         |                                                   | 4000         |             |
|------------|-----------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|-------------|
|            |           | $H_{max}$    | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              |             |
|            |           | [mm]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]        |
|            | 2000      | <b>32,52</b> | <b>7,96</b>                                       | <b>32,21</b> | <b>7,93</b>                                       | <b>31,76</b> | <b>7,88</b>                                       | <b>27,97</b> | <b>7,83</b>                                       | <b>24,47</b> | <b>7,78</b>                                       | <b>21,81</b> | <b>7,57</b> |
|            | 2500      | <b>32,23</b> | <b>6,47</b>                                       | <b>31,89</b> | <b>6,44</b>                                       | <b>31,51</b> | <b>6,40</b>                                       | <b>27,81</b> | <b>6,36</b>                                       | <b>24,33</b> | <b>6,32</b>                                       | <b>21,67</b> | <b>6,22</b> |
|            | 3000      | <b>31,97</b> | <b>5,44</b>                                       | <b>31,61</b> | <b>5,42</b>                                       | <b>31,17</b> | <b>5,39</b>                                       | <b>27,65</b> | <b>5,37</b>                                       | <b>24,18</b> | <b>5,30</b>                                       | <b>21,54</b> | <b>5,17</b> |
|            | 3500      | <b>31,75</b> | <b>4,60</b>                                       | <b>31,36</b> | <b>4,58</b>                                       | <b>30,89</b> | <b>4,54</b>                                       | <b>27,49</b> | <b>4,49</b>                                       | <b>24,04</b> | <b>4,43</b>                                       | <b>21,42</b> | <b>4,35</b> |
|            | 4000      | <b>31,52</b> | <b>3,87</b>                                       | <b>31,11</b> | <b>3,85</b>                                       | <b>30,64</b> | <b>3,83</b>                                       | <b>27,33</b> | <b>3,80</b>                                       | <b>23,90</b> | <b>3,76</b>                                       | <b>21,29</b> | <b>3,69</b> |

$F_z$  [kN] as a permanent load at distance L/2;  $F_x$  [kN] as a variable load at distance L/2.

| 2 Point Loads | $L_{max}$ | 1500         |                                                   | 2000         |                                                   | 2500         |                                                   | 3000         |                                                   | 3500         |                                                   | 4000         |             |
|---------------|-----------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|---------------------------------------------------|--------------|-------------|
|               |           | $H_{max}$    | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              | $F_{z, perm}$ for $F_x = 0$   $F_x = \mu_0 * F_z$ |              |             |
|               |           | [mm]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]                                              | [kN]         | [kN]        |
|               | 2000      | <b>16,27</b> | <b>3,98</b>                                       | <b>16,13</b> | <b>3,97</b>                                       | <b>15,98</b> | <b>3,95</b>                                       | <b>15,81</b> | <b>3,93</b>                                       | <b>15,38</b> | <b>3,90</b>                                       | <b>13,71</b> | <b>3,88</b> |
|               | 2500      | <b>16,14</b> | <b>3,23</b>                                       | <b>15,98</b> | <b>3,22</b>                                       | <b>15,80</b> | <b>3,21</b>                                       | <b>15,61</b> | <b>3,19</b>                                       | <b>15,41</b> | <b>3,17</b>                                       | <b>13,49</b> | <b>3,15</b> |
|               | 3000      | <b>16,01</b> | <b>2,72</b>                                       | <b>15,84</b> | <b>2,71</b>                                       | <b>15,65</b> | <b>2,70</b>                                       | <b>15,44</b> | <b>2,69</b>                                       | <b>15,22</b> | <b>2,67</b>                                       | <b>13,29</b> | <b>2,61</b> |
|               | 3500      | <b>15,90</b> | <b>2,30</b>                                       | <b>15,72</b> | <b>2,29</b>                                       | <b>15,51</b> | <b>2,28</b>                                       | <b>15,29</b> | <b>2,26</b>                                       | <b>15,06</b> | <b>2,23</b>                                       | <b>13,10</b> | <b>2,19</b> |
|               | 4000      | <b>15,79</b> | <b>1,93</b>                                       | <b>15,60</b> | <b>1,93</b>                                       | <b>15,39</b> | <b>1,92</b>                                       | <b>15,16</b> | <b>1,91</b>                                       | <b>14,91</b> | <b>1,89</b>                                       | <b>12,92</b> | <b>1,87</b> |

$F_z$  [kN] as permanent loads at distance  $2L/3$  and  $L/3$ ;  $F_x$  [kN] as variable loads at distance  $2L/3$  and  $L/3$ .

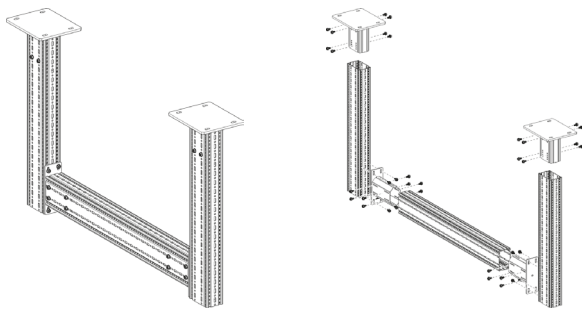
**3 Point Loads**



| H <sub>max</sub><br>[mm] | 1500                                                                                              |             | 2000                                                                                              |             | 2500                                                                                              |             | 3000                                                                                              |             | 3500                                                                                              |             | 4000                                                                                              |             |
|--------------------------|---------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------|-------------|
|                          | F <sub>z,perm</sub> for<br>F <sub>x</sub> = 0    F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |             | F <sub>z,perm</sub> for<br>F <sub>x</sub> = 0    F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |             | F <sub>z,perm</sub> for<br>F <sub>x</sub> = 0    F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |             | F <sub>z,perm</sub> for<br>F <sub>x</sub> = 0    F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |             | F <sub>z,perm</sub> for<br>F <sub>x</sub> = 0    F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |             | F <sub>z,perm</sub> for<br>F <sub>x</sub> = 0    F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |             |
| 2000                     | <b>10,85</b>                                                                                      | <b>2,66</b> | <b>10,76</b>                                                                                      | <b>2,64</b> | <b>10,66</b>                                                                                      | <b>2,63</b> | <b>10,53</b>                                                                                      | <b>2,62</b> | <b>10,44</b>                                                                                      | <b>2,61</b> | <b>9,52</b>                                                                                       | <b>2,59</b> |
| 2500                     | <b>10,76</b>                                                                                      | <b>2,16</b> | <b>10,66</b>                                                                                      | <b>2,15</b> | <b>10,55</b>                                                                                      | <b>2,14</b> | <b>10,43</b>                                                                                      | <b>2,13</b> | <b>10,30</b>                                                                                      | <b>2,12</b> | <b>9,64</b>                                                                                       | <b>2,10</b> |
| 3000                     | <b>10,68</b>                                                                                      | <b>1,82</b> | <b>10,57</b>                                                                                      | <b>1,81</b> | <b>10,45</b>                                                                                      | <b>1,80</b> | <b>10,32</b>                                                                                      | <b>1,79</b> | <b>10,18</b>                                                                                      | <b>1,78</b> | <b>9,49</b>                                                                                       | <b>1,75</b> |
| 3500                     | <b>10,61</b>                                                                                      | <b>1,53</b> | <b>10,49</b>                                                                                      | <b>1,53</b> | <b>10,36</b>                                                                                      | <b>1,52</b> | <b>10,22</b>                                                                                      | <b>1,51</b> | <b>10,07</b>                                                                                      | <b>1,49</b> | <b>9,35</b>                                                                                       | <b>1,47</b> |
| 4000                     | <b>10,54</b>                                                                                      | <b>1,29</b> | <b>10,41</b>                                                                                      | <b>1,29</b> | <b>10,28</b>                                                                                      | <b>1,28</b> | <b>10,13</b>                                                                                      | <b>1,27</b> | <b>9,97</b>                                                                                       | <b>1,26</b> | <b>9,22</b>                                                                                       | <b>1,25</b> |

F<sub>z</sub> [kN] as permanent loads at distance 3\*L/4, L/2 and L/4; F<sub>x</sub> [kN] as variable loads at distance 3\*L/4, L/2 and L/4.

For assembly with STA F 100 - 100/160 F<sub>z</sub> has to be reduced by the reduction ratio F<sub>a</sub>.



**Part List**

- 2 x End Support WBD F 100/160
- 3 x Beam Section TP F 100/160
- 2 x End Support STA F 100 - 100/160
- 24 x Self-Forming-Screw FLS F

| L (mm) | Reduction ratio F <sub>a</sub> [%] |                                       |
|--------|------------------------------------|---------------------------------------|
|        | F <sub>z,perm</sub> for            |                                       |
|        | F <sub>x</sub> = 0                 | F <sub>x</sub> = 0,2 * F <sub>z</sub> |
| 2000   | <b>-30%</b>                        | <b>0%</b>                             |
| 2500   | <b>-38%</b>                        | <b>0%</b>                             |
| 3000   | <b>-45%</b>                        | <b>0%</b>                             |
| 3500   | <b>-53%</b>                        | <b>0%</b>                             |
| 4000   | <b>-60%</b>                        | <b>0%</b>                             |

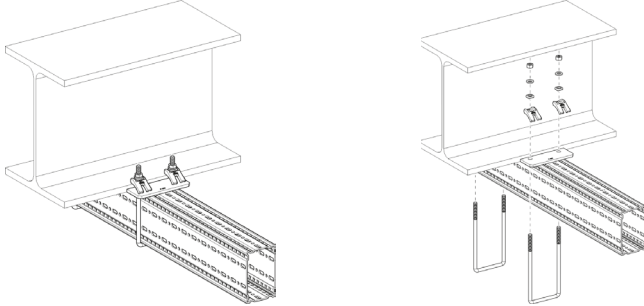
All illustrated structures are able to be installed standing as well.

Friction coefficient μ<sub>0</sub> = 0,2 for friction in longitudinal direction. Max. deviation H/100; L/200.



## Working loads in accordance with Eurocode 3

### Joining Beam Bracket F 100/160 horizontal



#### Part List

- 1 x Beam Section TP F 100/160
- 2 x U-Holder SB F 100/160-40

| Distributed Load |       | B         |               | 100             |               | 150             |               | 200             |               | 250             |               | 300             |               |
|------------------|-------|-----------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|
|                  |       | $L_{max}$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ |
|                  | [mm]  | [kN/m]    | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          | [kN/m]          | [kN]          |
| 300              | 14,39 | 4,32      | 20,42         | 6,13            | 24,82         | 7,45            | 28,17         | 8,45            | 30,81         | 9,24            |               |                 |               |
| 500              | 5,64  | 2,82      | 8,38          | 4,19            | 10,53         | 5,26            | 12,27         | 6,13            | 13,70         | 6,85            |               |                 |               |
| 700              | 3,02  | 2,12      | 4,62          | 3,23            | 5,93          | 4,15            | 7,03          | 4,92            | 7,96          | 5,58            |               |                 |               |
| 900              | 1,88  | 1,69      | 2,93          | 2,64            | 3,82          | 3,44            | 4,59          | 4,13            | 5,26          | 4,73            |               |                 |               |
| 1100             | 1,28  | 1,41      | 2,02          | 2,22            | 2,67          | 2,94            | 3,24          | 3,56            | 3,74          | 4,12            |               |                 |               |

$q_z$  [kN/m] as permanent load over L.

| Point Load |      | B         |                             | 100                                   |                             | 150                                   |                             | 200                                   |                             | 250                                   |                             | 300                                   |                             |
|------------|------|-----------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|
|            |      | $L_{max}$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ |
|            | [mm] | [kN]      | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        |
| 300        | 2,36 | 1,12      | 3,51                        | 1,67                                  | 4,43                        | 2,10                                  | 5,17                        | 2,45                                  | 5,79                        | 2,75                                  |                             |                                       |                             |
| 500        | 1,55 | 0,74      | 2,41                        | 1,14                                  | 3,14                        | 1,49                                  | 3,77                        | 1,79                                  | 4,32                        | 2,05                                  |                             |                                       |                             |
| 700        | 1,16 | 0,55      | 1,83                        | 0,87                                  | 2,43                        | 1,15                                  | 2,96                        | 1,41                                  | 3,44                        | 1,63                                  |                             |                                       |                             |
| 900        | 0,92 | 0,44      | 1,48                        | 0,70                                  | 1,98                        | 0,94                                  | 2,44                        | 1,16                                  | 2,86                        | 1,36                                  |                             |                                       |                             |
| 1100       | 0,77 | 0,36      | 1,24                        | 0,59                                  | 1,67                        | 0,79                                  | 2,08                        | 0,99                                  | 2,45                        | 1,16                                  |                             |                                       |                             |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads |      | B         |                             | 100                                   |                             | 150                                   |                             | 200                                   |                             | 250                                   |                             | 300                                   |                             |
|---------------|------|-----------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|
|               |      | $L_{max}$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ |
|               | [mm] | [kN]      | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        |
| 300           | 1,46 | 0,69      | 2,12                        | 1,01                                  | 2,62                        | 1,24                                  | 3,01                        | 1,43                                  | 3,32                        | 1,57                                  |                             |                                       |                             |
| 500           | 0,98 | 0,47      | 1,50                        | 0,71                                  | 1,92                        | 0,91                                  | 2,27                        | 1,08                                  | 2,57                        | 1,22                                  |                             |                                       |                             |
| 700           | 0,74 | 0,35      | 1,16                        | 0,55                                  | 1,51                        | 0,72                                  | 1,82                        | 0,86                                  | 2,09                        | 0,99                                  |                             |                                       |                             |
| 900           | 0,60 | 0,28      | 0,94                        | 0,45                                  | 1,25                        | 0,59                                  | 1,52                        | 0,72                                  | 1,76                        | 0,84                                  |                             |                                       |                             |
| 1100          | 0,50 | 0,24      | 0,79                        | 0,38                                  | 1,06                        | 0,50                                  | 1,30                        | 0,62                                  | 1,53                        | 0,72                                  |                             |                                       |                             |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

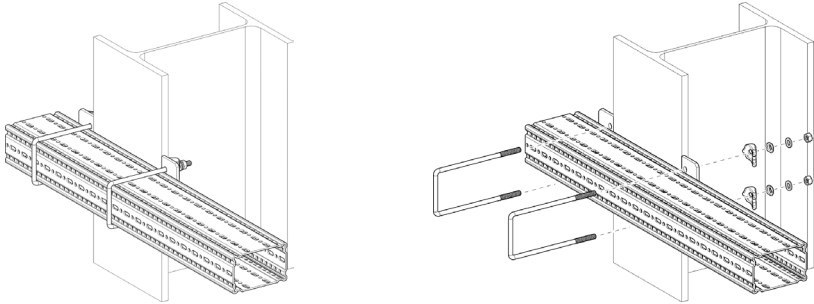
| 3 Point Loads |      | B         |                             | 100                                   |                             | 150                                   |                             | 200                                   |                             | 250                                   |                             | 300                                   |                             |
|---------------|------|-----------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|---------------------------------------|-----------------------------|
|               |      | $L_{max}$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ | $F_{z, perm}$ for $F_x = \mu_0 * F_z$ | $F_{z, perm}$ for $F_x = 0$ |
|               | [mm] | [kN]      | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        | [kN]                                  | [kN]                        |
| 300           | 1,06 | 0,50      | 1,52                        | 0,72                                  | 1,86                        | 0,88                                  | 2,12                        | 1,00                                  | 2,33                        | 1,10                                  |                             |                                       |                             |
| 500           | 0,72 | 0,34      | 1,08                        | 0,52                                  | 1,38                        | 0,65                                  | 1,62                        | 0,77                                  | 1,82                        | 0,87                                  |                             |                                       |                             |
| 700           | 0,55 | 0,26      | 0,84                        | 0,40                                  | 1,10                        | 0,52                                  | 1,31                        | 0,62                                  | 1,50                        | 0,71                                  |                             |                                       |                             |
| 900           | 0,44 | 0,21      | 0,69                        | 0,33                                  | 0,91                        | 0,43                                  | 1,10                        | 0,52                                  | 1,27                        | 0,61                                  |                             |                                       |                             |
| 1100          | 0,37 | 0,18      | 0,58                        | 0,28                                  | 0,78                        | 0,37                                  | 0,95                        | 0,45                                  | 1,11                        | 0,53                                  |                             |                                       |                             |

$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction. Max. deviation L/100.

## Working loads in accordance with Eurocode 3

### Joining Beam Bracket F 100/160 vertical



**Part List**  
 1 x Beam Section TP F 100/160  
 2 x U-Holder SB F 100/160-40

**Distributed Load**

| L <sub>max</sub> | 100                  |                                     | 150                  |                                     | 200                  |                                     | 250                  |                                     | 300                  |                                     |
|------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|
|                  | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) |
| 300              | 3,21                 | 0,96                                | 4,46                 | 1,34                                | 5,34                 | 1,60                                | 5,99                 | 1,80                                | 6,49                 | 1,95                                |
| 500              | 1,36                 | 0,68                                | 1,98                 | 0,99                                | 2,47                 | 1,23                                | 2,86                 | 1,43                                | 3,17                 | 1,58                                |
| 700              | 0,75                 | 0,52                                | 1,13                 | 0,79                                | 1,44                 | 1,00                                | 1,69                 | 1,18                                | 1,91                 | 1,34                                |
| 900              | 0,47                 | 0,43                                | 0,73                 | 0,65                                | 0,94                 | 0,85                                | 1,12                 | 1,01                                | 1,28                 | 1,15                                |
| 1100             | 0,33                 | 0,36                                | 0,51                 | 0,56                                | 0,67                 | 0,73                                | 0,80                 | 0,88                                | 0,92                 | 1,02                                |

q<sub>z</sub> [kN/m] as permanent load over L.

**Point Load**

| L <sub>max</sub> | 100                                         |                                                                           | 150                                         |                                                                           | 200                                         |                                                                           | 250                                         |                                                                           | 300                                         |                                                                           |
|------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|
|                  | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |
| 300              | 0,59                                        | 0,56                                                                      | 0,88                                        | 0,84                                                                      | 1,11                                        | 1,06                                                                      | 1,29                                        | 1,24                                                                      | 1,45                                        | 1,39                                                                      |
| 500              | 0,39                                        | 0,37                                                                      | 0,60                                        | 0,58                                                                      | 0,79                                        | 0,75                                                                      | 0,94                                        | 0,90                                                                      | 1,08                                        | 1,03                                                                      |
| 700              | 0,29                                        | 0,28                                                                      | 0,46                                        | 0,44                                                                      | 0,61                                        | 0,58                                                                      | 0,74                                        | 0,71                                                                      | 0,86                                        | 0,83                                                                      |
| 900              | 0,23                                        | 0,22                                                                      | 0,37                                        | 0,35                                                                      | 0,50                                        | 0,48                                                                      | 0,61                                        | 0,59                                                                      | 0,72                                        | 0,69                                                                      |
| 1100             | 0,19                                        | 0,18                                                                      | 0,31                                        | 0,30                                                                      | 0,42                                        | 0,40                                                                      | 0,52                                        | 0,50                                                                      | 0,61                                        | 0,59                                                                      |

F<sub>z</sub> [kN] as a permanent load at distance L; F<sub>x</sub> [kN] as a variable load at distance L.

**2 Point Loads**

| L <sub>max</sub> | 100                                         |                                                                           | 150                                         |                                                                           | 200                                         |                                                                           | 250                                         |                                                                           | 300                                         |                                                                           |
|------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|
|                  | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |
| 300              | 0,37                                        | 0,35                                                                      | 0,53                                        | 0,51                                                                      | 0,65                                        | 0,63                                                                      | 0,75                                        | 0,72                                                                      | 0,83                                        | 0,80                                                                      |
| 500              | 0,25                                        | 0,24                                                                      | 0,37                                        | 0,36                                                                      | 0,48                                        | 0,46                                                                      | 0,57                                        | 0,54                                                                      | 0,64                                        | 0,62                                                                      |
| 700              | 0,19                                        | 0,18                                                                      | 0,29                                        | 0,28                                                                      | 0,38                                        | 0,36                                                                      | 0,46                                        | 0,44                                                                      | 0,52                                        | 0,50                                                                      |
| 900              | 0,15                                        | 0,14                                                                      | 0,24                                        | 0,23                                                                      | 0,31                                        | 0,30                                                                      | 0,38                                        | 0,36                                                                      | 0,44                                        | 0,42                                                                      |
| 1100             | 0,13                                        | 0,12                                                                      | 0,20                                        | 0,19                                                                      | 0,27                                        | 0,26                                                                      | 0,33                                        | 0,31                                                                      | 0,38                                        | 0,37                                                                      |

F<sub>z</sub> [kN] as permanent loads at distance L and L/2; F<sub>x</sub> [kN] as variable loads at distance L and L/2.

**3 Point Loads**

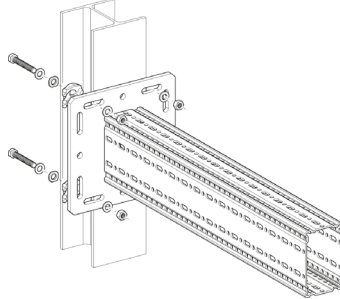
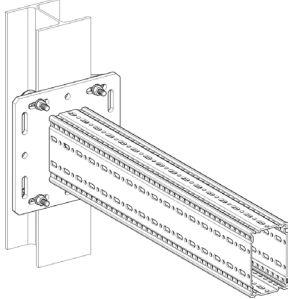
| L <sub>max</sub> | 100                                         |                                                                           | 150                                         |                                                                           | 200                                         |                                                                           | 250                                         |                                                                           | 300                                         |                                                                           |
|------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|
|                  | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>z, perm</sub> for F <sub>x</sub> = 0 | F <sub>z, perm</sub> for F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |
| 300              | 0,27                                        | 0,25                                                                      | 0,38                                        | 0,36                                                                      | 0,46                                        | 0,45                                                                      | 0,53                                        | 0,51                                                                      | 0,58                                        | 0,56                                                                      |
| 500              | 0,18                                        | 0,17                                                                      | 0,27                                        | 0,26                                                                      | 0,35                                        | 0,33                                                                      | 0,41                                        | 0,39                                                                      | 0,46                                        | 0,44                                                                      |
| 700              | 0,14                                        | 0,13                                                                      | 0,21                                        | 0,20                                                                      | 0,28                                        | 0,26                                                                      | 0,33                                        | 0,32                                                                      | 0,38                                        | 0,36                                                                      |
| 900              | 0,11                                        | 0,11                                                                      | 0,17                                        | 0,17                                                                      | 0,23                                        | 0,22                                                                      | 0,28                                        | 0,27                                                                      | 0,32                                        | 0,31                                                                      |
| 1100             | 0,09                                        | 0,09                                                                      | 0,15                                        | 0,14                                                                      | 0,20                                        | 0,19                                                                      | 0,24                                        | 0,23                                                                      | 0,28                                        | 0,27                                                                      |

F<sub>z</sub> [kN] as permanent loads at distance L, 2\*L/3 and L/3; F<sub>x</sub> [kN] as variable loads at distance L, 2\*L/3 and L/3.

Friction coefficient μ<sub>0</sub> = 0,2 for friction in longitudinal direction; Max. deviation L/100.

### Working loads in accordance with Eurocode 3

#### Beam Bracket F 100/160 - Variante a) clamped



#### Part List

- 1 x Beam Bracket TKO F 100/160
- 1 x Assembly Set MS 5P M12 S

| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
|------------------|-----------|---------------|-----------------|
|                  | [mm]      | [kN/m]        | [kN]            |
|                  | 300       | <b>47,89</b>  | <b>14,37</b>    |
|                  | 500       | <b>36,39</b>  | <b>18,20</b>    |
|                  | 700       | <b>18,57</b>  | <b>13,00</b>    |
|                  | 900       | <b>11,23</b>  | <b>10,11</b>    |
|                  | 1100      | <b>7,52</b>   | <b>8,27</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$   | $F_{z, perm}$ for |                     |
|------------|-------------|-------------------|---------------------|
|            |             | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|            | [mm]        | [kN]              | [kN]                |
|            | 300         | <b>15,16</b>      | <b>9,35</b>         |
|            | 500         | <b>9,10</b>       | <b>5,61</b>         |
|            | 700         | <b>6,50</b>       | <b>4,01</b>         |
|            | 900         | <b>5,05</b>       | <b>3,12</b>         |
| 1100       | <b>4,14</b> | <b>2,55</b>       |                     |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads | $L_{max}$   | $F_{z, perm}$ for |                     |
|---------------|-------------|-------------------|---------------------|
|               |             | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]        | [kN]              | [kN]                |
|               | 300         | <b>9,41</b>       | <b>6,23</b>         |
|               | 500         | <b>6,07</b>       | <b>3,74</b>         |
|               | 700         | <b>4,33</b>       | <b>2,67</b>         |
|               | 900         | <b>3,37</b>       | <b>2,08</b>         |
| 1100          | <b>2,76</b> | <b>1,70</b>       |                     |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

| 3 Point Loads | $L_{max}$   | $F_{z, perm}$ for |                     |
|---------------|-------------|-------------------|---------------------|
|               |             | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]        | [kN]              | [kN]                |
|               | 300         | <b>5,69</b>       | <b>4,67</b>         |
|               | 500         | <b>4,55</b>       | <b>2,80</b>         |
|               | 700         | <b>3,25</b>       | <b>2,00</b>         |
|               | 900         | <b>2,53</b>       | <b>1,56</b>         |
| 1100          | <b>2,07</b> | <b>1,27</b>       |                     |

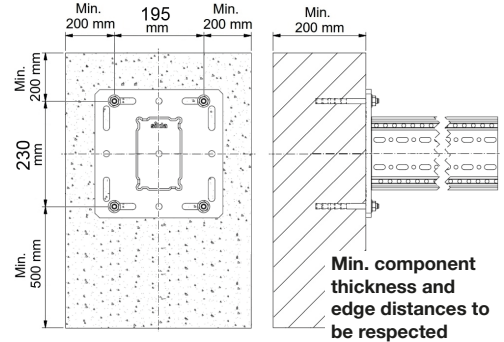
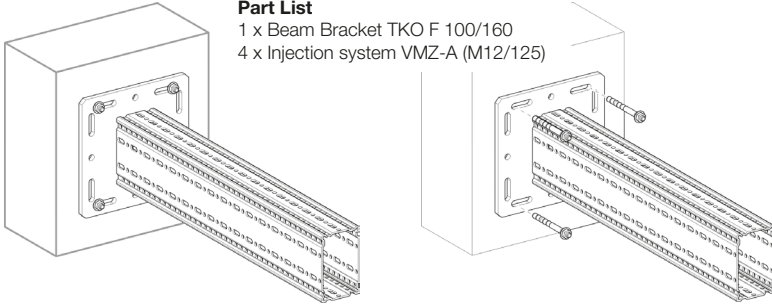
$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/3.

## Working loads in accordance with Eurocode 3

### Beam Bracket F 100/160 - Variante b) anchored

**Part List**

- 1 x Beam Bracket TKO F 100/160
- 4 x Injection system VMZ-A (M12/125)



| Distributed Load | $L_{max}$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
|------------------|-----------|---------------|-----------------|
|                  | [mm]      | [kN/m]        | [kN]            |
|                  | 300       | <b>49,07</b>  | <b>14,72</b>    |
|                  | 500       | <b>26,18</b>  | <b>13,09</b>    |
|                  | 700       | <b>16,83</b>  | <b>11,78</b>    |
|                  | 900       | <b>11,90</b>  | <b>10,71</b>    |
|                  | 1100      | <b>8,93</b>   | <b>9,82</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load | $L_{max}$ | $F_{z, perm}$ for |                     |
|------------|-----------|-------------------|---------------------|
|            |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|            | [mm]      | [kN]              | [kN]                |
|            | 300       | <b>12,40</b>      | <b>12,40</b>        |
|            | 500       | <b>10,25</b>      | <b>10,25</b>        |
|            | 700       | <b>8,73</b>       | <b>8,73</b>         |
|            | 900       | <b>7,07</b>       | <b>7,07</b>         |
|            | 1100      | <b>5,78</b>       | <b>5,78</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]      | [kN]              | [kN]                |
|               | 300       | <b>6,73</b>       | <b>6,73</b>         |
|               | 500       | <b>5,75</b>       | <b>5,75</b>         |
|               | 700       | <b>5,01</b>       | <b>5,01</b>         |
|               | 900       | <b>4,45</b>       | <b>4,45</b>         |
|               | 1100      | <b>3,86</b>       | <b>3,86</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

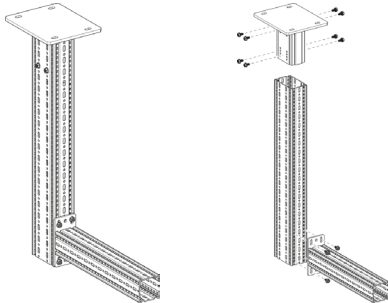
| 3 Point Loads | $L_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]      | [kN/m]            | [kN]                |
|               | 300       | <b>4,62</b>       | <b>4,62</b>         |
|               | 500       | <b>3,99</b>       | <b>3,99</b>         |
|               | 700       | <b>3,52</b>       | <b>3,52</b>         |
|               | 900       | <b>3,14</b>       | <b>3,14</b>         |
|               | 1100      | <b>2,84</b>       | <b>2,84</b>         |

$F_z$  [kN] as permanent loads at distance L, 2L/3 and L/3;  $F_x$  [kN] as variable loads at distance L, 2L/3 and L/3.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction; Max. deviation L/100.

## Working loads in accordance with Eurocode 3

### L-Construction F 100/160 - 100



#### Part List

- 1 x End Support WBD F 100/160
- 1 x Beam Section TP F 100/160
- 1 x Cantilever Bracket AK F 100
- 12 x Self-Forming-Screw FLS F

| Distributed Load |      | 300           |                 | 500           |                 | 700           |                 | 900           |                 | 1100          |                 |
|------------------|------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
|                  |      | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ | $q_{z, perm}$ | $F_z (q_z * L)$ |
| $H_{max}$        | [mm] | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            | [kN/m]        | [kN]            |
|                  | 2000 | <b>22,46</b>  | <b>6,74</b>     | <b>9,69</b>   | <b>4,84</b>     | <b>5,26</b>   | <b>3,68</b>     | <b>3,25</b>   | <b>2,92</b>     | <b>2,18</b>   | <b>2,39</b>     |
|                  | 2500 | <b>20,64</b>  | <b>6,19</b>     | <b>8,95</b>   | <b>4,48</b>     | <b>4,87</b>   | <b>3,41</b>     | <b>3,02</b>   | <b>2,71</b>     | <b>2,02</b>   | <b>2,23</b>     |
|                  | 3000 | <b>19,10</b>  | <b>5,73</b>     | <b>8,32</b>   | <b>4,16</b>     | <b>4,54</b>   | <b>3,18</b>     | <b>2,81</b>   | <b>2,53</b>     | <b>1,89</b>   | <b>2,08</b>     |
|                  | 3500 | <b>17,76</b>  | <b>5,33</b>     | <b>7,77</b>   | <b>3,88</b>     | <b>4,25</b>   | <b>2,98</b>     | <b>2,64</b>   | <b>2,37</b>     | <b>1,77</b>   | <b>1,95</b>     |

$q_z$  [kN/m] as permanent load over L.

| Point Load |      | 300         |                     | 500         |                     | 700         |                     | 900         |                     | 1100        |                     |
|------------|------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|
|            |      | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ |
| $H_{max}$  | [mm] | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                |
|            | 2000 | <b>4,00</b> | <b>3,39</b>         | <b>2,65</b> | <b>2,49</b>         | <b>1,94</b> | <b>1,94</b>         | <b>1,50</b> | <b>1,50</b>         | <b>1,21</b> | <b>1,21</b>         |
|            | 2500 | <b>3,70</b> | <b>3,16</b>         | <b>2,46</b> | <b>2,36</b>         | <b>1,80</b> | <b>1,80</b>         | <b>1,40</b> | <b>1,40</b>         | <b>1,13</b> | <b>1,13</b>         |
|            | 3000 | <b>3,44</b> | <b>2,88</b>         | <b>2,30</b> | <b>2,25</b>         | <b>1,69</b> | <b>1,69</b>         | <b>1,31</b> | <b>1,31</b>         | <b>1,06</b> | <b>1,06</b>         |
|            | 3500 | <b>3,21</b> | <b>2,36</b>         | <b>2,15</b> | <b>2,14</b>         | <b>1,58</b> | <b>1,58</b>         | <b>1,23</b> | <b>1,23</b>         | <b>0,99</b> | <b>0,99</b>         |

$F_z$  [kN] as a permanent load at distance L;  $F_x$  [kN] as a variable load at distance L.

| 2 Point Loads |      | 300         |                     | 500         |                     | 700         |                     | 900         |                     | 1100        |                     |
|---------------|------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|
|               |      | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ |
| $H_{max}$     | [mm] | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                |
|               | 2000 | <b>2,57</b> | <b>1,95</b>         | <b>1,74</b> | <b>1,49</b>         | <b>1,29</b> | <b>1,20</b>         | <b>1,01</b> | <b>1,00</b>         | <b>0,82</b> | <b>0,82</b>         |
|               | 2500 | <b>2,37</b> | <b>1,80</b>         | <b>1,61</b> | <b>1,40</b>         | <b>1,20</b> | <b>1,14</b>         | <b>0,94</b> | <b>0,94</b>         | <b>0,76</b> | <b>0,76</b>         |
|               | 3000 | <b>2,20</b> | <b>1,44</b>         | <b>1,50</b> | <b>1,32</b>         | <b>1,12</b> | <b>1,08</b>         | <b>0,88</b> | <b>0,88</b>         | <b>0,71</b> | <b>0,71</b>         |
|               | 3500 | <b>2,05</b> | <b>1,18</b>         | <b>1,40</b> | <b>1,18</b>         | <b>1,05</b> | <b>1,03</b>         | <b>0,82</b> | <b>0,82</b>         | <b>0,67</b> | <b>0,67</b>         |

$F_z$  [kN] as permanent loads at distance L and L/2;  $F_x$  [kN] as variable loads at distance L and L/2.

| 3 Point Loads |      | 300         |                     | 500         |                     | 700         |                     | 900         |                     | 1100        |                     |
|---------------|------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|
|               |      | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ | $F_x = 0$   | $F_x = \mu_0 * F_z$ |
| $H_{max}$     | [mm] | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                | [kN]        | [kN]                |
|               | 2000 | <b>1,87</b> | <b>1,37</b>         | <b>1,28</b> | <b>1,06</b>         | <b>0,95</b> | <b>0,86</b>         | <b>0,74</b> | <b>0,72</b>         | <b>0,60</b> | <b>0,60</b>         |
|               | 2500 | <b>1,72</b> | <b>1,20</b>         | <b>1,18</b> | <b>0,99</b>         | <b>0,88</b> | <b>0,81</b>         | <b>0,69</b> | <b>0,69</b>         | <b>0,56</b> | <b>0,56</b>         |
|               | 3000 | <b>1,60</b> | <b>0,96</b>         | <b>1,10</b> | <b>0,93</b>         | <b>0,82</b> | <b>0,77</b>         | <b>0,65</b> | <b>0,65</b>         | <b>0,53</b> | <b>0,53</b>         |
|               | 3500 | <b>1,49</b> | <b>0,79</b>         | <b>1,03</b> | <b>0,79</b>         | <b>0,77</b> | <b>0,73</b>         | <b>0,61</b> | <b>0,61</b>         | <b>0,49</b> | <b>0,49</b>         |

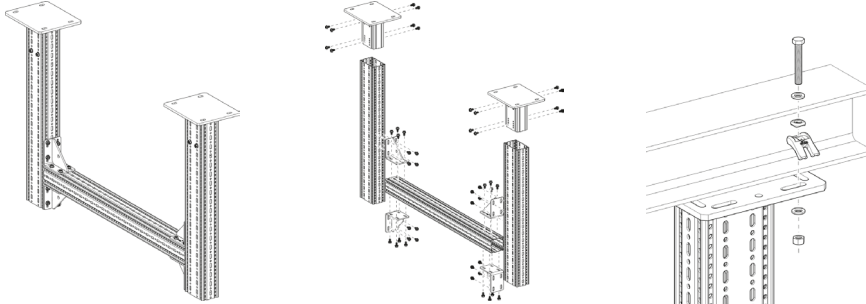
$F_z$  [kN] as permanent loads at distance L, 2\*L/3 and L/2;  $F_x$  [kN] as variable loads at distance L, 2\*L/3 and L/2.

All illustrated structures are able to be installed standing as well.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction; Max. deviation H/100; L/100.

## Working loads in accordance with Eurocode 3

### Frame F 100/160 - 100



- Part List**  
 2 x End Support WBD F 100/160  
 2 x Beam Section TP F 100/160  
 1 x Beam Section TP F 100  
 4 x Corner Bracket WD F 100  
 48 x Self-Forming-Screw FLS F

| Distributed Load | L <sub>max</sub><br>H <sub>max</sub><br>[mm] | 1500                 |                                     | 2000                 |                                     | 2500                 |                                     | 3000                 |                                     | 3500                 |                                     | 4000                 |                                     |
|------------------|----------------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|----------------------|-------------------------------------|
|                  |                                              | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) | q <sub>z, perm</sub> | F <sub>z</sub> (q <sub>z</sub> * L) |
|                  |                                              | [kN/m]               | [kN]                                | [kN/m]               | [kN]                                | [kN/m]               | [kN]                                | [kN/m]               | [kN]                                | [kN/m]               | [kN]                                | [kN/m]               | [kN]                                |
|                  | 1500                                         | 22,07                | 26,92                               | 16,39                | 28,20                               | 12,90                | 28,63                               | 9,64                 | 26,22                               | 6,61                 | 21,28                               | 4,67                 | 17,37                               |
|                  | 2000                                         | 22,07                | 26,92                               | 16,39                | 28,20                               | 12,90                | 28,63                               | 9,60                 | 26,12                               | 6,48                 | 20,87                               | 4,58                 | 17,04                               |
|                  | 2500                                         | 22,07                | 26,92                               | 16,39                | 28,20                               | 12,90                | 28,63                               | 9,41                 | 25,60                               | 6,35                 | 20,46                               | 4,49                 | 16,72                               |
|                  | 3000                                         | 21,95                | 26,78                               | 16,27                | 27,98                               | 12,89                | 28,62                               | 9,23                 | 25,11                               | 6,24                 | 20,08                               | 4,41                 | 16,42                               |
|                  | 3500                                         | 21,87                | 26,68                               | 16,22                | 27,90                               | 12,81                | 28,43                               | 9,06                 | 24,65                               | 6,12                 | 19,72                               | 4,34                 | 16,13                               |

q<sub>z</sub> [kN/m] as permanent load over L.

| Point Load | L <sub>max</sub><br>H <sub>max</sub><br>[mm] | 1500                     |                                                  | 2000                     |                                                  | 2500                     |                                                  | 3000                     |                                                  | 3500                     |                                                  | 4000                     |                                                  |
|------------|----------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|
|            |                                              | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  |
|            |                                              | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |
|            | 1500                                         | 29,43                    | 9,89                                             | 23,20                    | 9,82                                             | 19,25                    | 9,75                                             | 16,51                    | 9,68                                             | 13,39                    | 8,88                                             | 10,73                    | 7,91                                             |
|            | 2000                                         | 29,20                    | 7,57                                             | 23,03                    | 7,51                                             | 19,12                    | 7,45                                             | 16,41                    | 7,39                                             | 13,15                    | 7,29                                             | 10,55                    | 6,76                                             |
|            | 2500                                         | 28,96                    | 6,13                                             | 22,85                    | 6,09                                             | 18,98                    | 6,04                                             | 16,29                    | 5,99                                             | 12,91                    | 5,94                                             | 10,37                    | 5,68                                             |
|            | 3000                                         | 28,72                    | 5,16                                             | 22,67                    | 5,12                                             | 18,83                    | 5,09                                             | 16,17                    | 5,04                                             | 12,69                    | 4,95                                             | 10,19                    | 4,77                                             |
|            | 3500                                         | 28,49                    | 4,40                                             | 22,49                    | 4,37                                             | 18,69                    | 4,32                                             | 16,00                    | 4,25                                             | 12,48                    | 4,16                                             | 10,03                    | 4,05                                             |

F<sub>z</sub> [kN] as a permanent load at distance L/2; F<sub>x</sub> [kN] as a variable load at distance L/2.

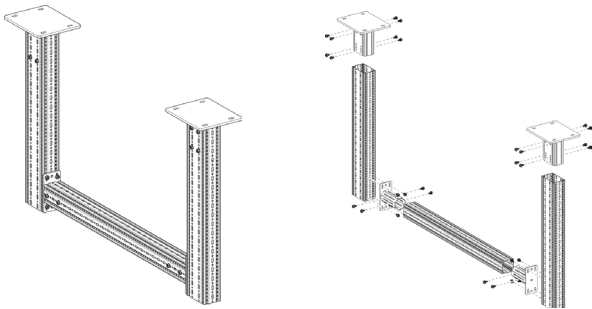
| 2 Point Loads | L <sub>max</sub><br>H <sub>max</sub><br>[mm] | 1500                     |                                                  | 2000                     |                                                  | 2500                     |                                                  | 3000                     |                                                  | 3500                     |                                                  | 4000                     |                                                  |
|---------------|----------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|--------------------------|--------------------------------------------------|
|               |                                              | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  | F <sub>z, perm</sub> for |                                                  |
|               |                                              | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> | F <sub>x</sub> = 0       | F <sub>x</sub> = μ <sub>0</sub> * F <sub>z</sub> |
|               | 1500                                         | 16,45                    | 4,95                                             | 16,24                    | 4,92                                             | 13,53                    | 4,89                                             | 10,17                    | 4,86                                             | 7,95                     | 4,57                                             | 6,39                     | 4,11                                             |
|               | 2000                                         | 16,45                    | 3,79                                             | 16,24                    | 3,76                                             | 13,25                    | 3,74                                             | 9,98                     | 3,72                                             | 7,80                     | 3,69                                             | 6,27                     | 3,46                                             |
|               | 2500                                         | 16,45                    | 3,07                                             | 16,24                    | 3,05                                             | 12,99                    | 3,03                                             | 9,79                     | 3,01                                             | 7,65                     | 2,99                                             | 6,16                     | 2,88                                             |
|               | 3000                                         | 16,38                    | 2,58                                             | 16,09                    | 2,57                                             | 12,74                    | 2,55                                             | 9,61                     | 2,53                                             | 7,52                     | 2,49                                             | 6,05                     | 2,41                                             |
|               | 3500                                         | 16,31                    | 2,20                                             | 16,02                    | 2,18                                             | 12,51                    | 2,16                                             | 9,44                     | 2,13                                             | 7,39                     | 2,09                                             | 5,95                     | 2,04                                             |

F<sub>z</sub> [kN] as permanent loads at distance 2\*L/3 and L/3; F<sub>x</sub> [kN] as variable loads at distance 2\*L/3 and L/3.

| 3 Point Loads |      | $L_{max}$ | 1500                |           | 2000                |           | 2500                |           | 3000                |           | 3500                |           | 4000                |      |
|---------------|------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|------|
|               |      |           | $F_{z, perm}$ for   |           | $F_{z, perm}$ for   |           | $F_{z, perm}$ for   |           | $F_{z, perm}$ for   |           | $F_{z, perm}$ for   |           | $F_{z, perm}$ for   |      |
| $H_{max}$     | [mm] | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ | $F_x = 0$ | $F_x = \mu_0 * F_z$ |      |
|               |      |           |                     | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN]      | [kN]                | [kN] |
|               | 1500 | 10,99     | 3,30                | 10,86     | 3,28                | 9,80      | 3,26                | 7,58      | 3,25                | 5,93      | 3,08                | 4,77      | 2,79                |      |
|               | 2000 | 10,99     | 2,53                | 10,86     | 2,51                | 9,80      | 2,49                | 7,43      | 2,48                | 5,82      | 2,46                | 4,69      | 2,33                |      |
|               | 2500 | 10,99     | 2,05                | 10,85     | 2,03                | 9,64      | 2,02                | 7,29      | 2,01                | 5,71      | 1,99                | 4,60      | 1,93                |      |
|               | 3000 | 10,92     | 1,72                | 10,76     | 1,71                | 9,45      | 1,70                | 7,15      | 1,69                | 5,61      | 1,67                | 4,52      | 1,62                |      |
|               | 3500 | 10,87     | 1,47                | 10,71     | 1,46                | 9,28      | 1,44                | 7,02      | 1,42                | 5,51      | 1,40                | 4,44      | 1,36                |      |

$F_z$  [kN] as permanent loads at distance  $3*L/4$ ,  $L/2$  and  $L/4$ ;  $F_x$  [kN] as variable loads at distance  $3*L/4$ ,  $L/4$  and  $L/4$ .

For assembly with STA F 100 - 100/160  $F_z$  has to be reduced by the reduction ratio  $F_a$ .



### Part List

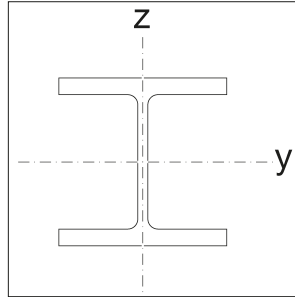
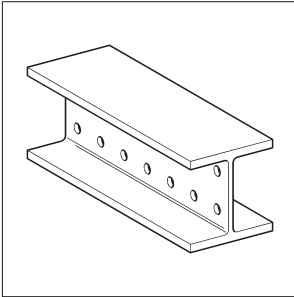
- 2 x End Support WBD F 100/160
- 2 x Beam Section TP F 100/160
- 1 x Beam Section TP F 100
- 2 x End Support STA F 100
- 32 x Self-Forming-Screw FLS F

| L (mm) | Reduction ratio $F_a$ [%] |                   |
|--------|---------------------------|-------------------|
|        | $F_x = 0$                 | $F_x = 0,2 * F_z$ |
| 1500   | -15%                      | 0%                |
| 2000   | -25%                      | 0%                |
| 2500   | -30%                      | 0%                |
| 3000   | -30%                      | 0%                |
| 3500   | -35%                      | -5%               |

All illustrated structures are able to be installed standing as well.

Friction coefficient  $\mu_0 = 0,2$  for friction in longitudinal direction; Max. deviation  $H/100$ ; Max. bending  $L/200$ .

## Section data Simotec Beam System 100 / 120



| Type    | Moment of Inertia [cm <sup>4</sup> ] |            | Section Modulus [cm <sup>3</sup> ] |             | Radius of Inertia [cm] |             | Torsional Moment [cm <sup>4</sup> ] | Cross Section [cm <sup>2</sup> ]<br>A | Weight [kg/m]<br>G |
|---------|--------------------------------------|------------|------------------------------------|-------------|------------------------|-------------|-------------------------------------|---------------------------------------|--------------------|
|         | $I_y$                                | $I_z$      | $W_y$                              | $W_z$       | $i_y$                  | $i_z$       |                                     |                                       |                    |
| H 100   | <b>341</b>                           | <b>133</b> | <b>71,0</b>                        | <b>26,7</b> | <b>4,14</b>            | <b>2,59</b> | <b>5,15</b>                         | <b>19,9</b>                           | <b>16,40</b>       |
| HEA 100 | 349                                  | 134        | 72,8                               | 26,8        | 4,06                   | 2,51        | 5,26                                | 21,2                                  | 16,70              |
| H 120   | <b>853</b>                           | <b>317</b> | <b>142,0</b>                       | <b>52,8</b> | <b>5,13</b>            | <b>3,13</b> | <b>13,66</b>                        | <b>32,3</b>                           | <b>26,50</b>       |
| HEB 120 | 864                                  | 318        | 144,0                              | 52,9        | 5,04                   | 3,06        | 13,90                               | 34,0                                  | 26,70              |

### Remarks

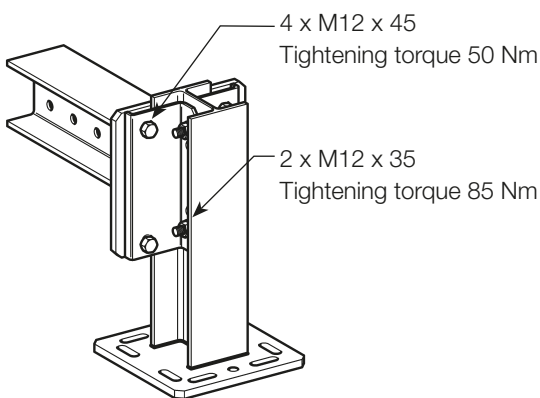
HEA 100 = IPBI 100 as per DIN 1025 Part 3: 1994-03: B100; H 96; Flange 8; Web 5 (EN 53)

HEB 120 = IPB 120 as per DIN 1025 Part 2: 1995-11: B120; H120; Flange11; Web 6,5 (EN 53)

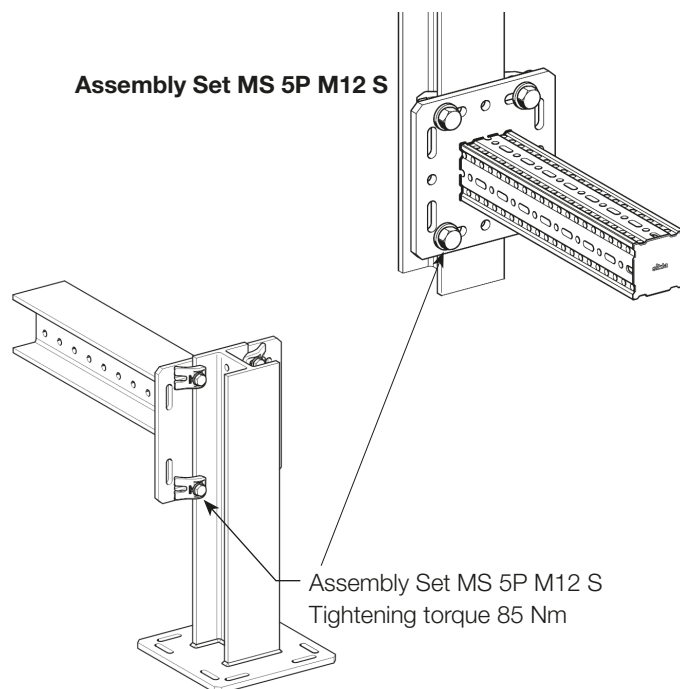
Sikla Beam Sections H 100 und H 120 are hot-dipped-galvanized as per DIN 50976 / DIN EN ISO 1461.

## Tightening torque for typical connections

### Bracket Plates FV 100/120



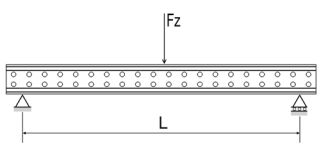
### Assembly Set MS 5P M12 S





## Working loads in accordance with Eurocode 3

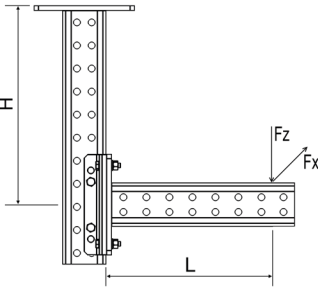
| Beam Section 100 | $L_{max}$ | $F_{z, perm}$ |
|------------------|-----------|---------------|
|                  | [mm]      | [kN]          |
|                  | 1000      | <b>50,0</b>   |
|                  | 1600      | <b>31,0</b>   |
|                  | 2000      | <b>24,5</b>   |
|                  | 3000      | <b>15,0</b>   |
|                  | 4000      | <b>10,5</b>   |
|                  | 5000      | <b>7,8</b>    |
|                  | 6000      | <b>5,9</b>    |



**Part List**  
Sikla-Beam Section H100

$F_z$  [kN] as a permanent load at L/2; Max. bending L/150.

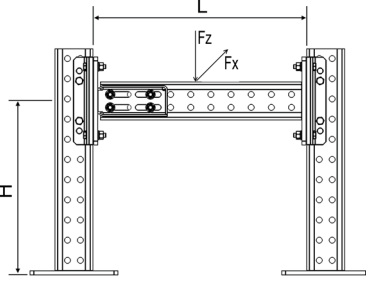
| L-Construction 100 | $L_{max}$ | 200               |                     | 600               |                     | 1000              |                     |
|--------------------|-----------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|                    |           | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     |
|                    |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| $H_{max}$          | [mm]      | [kN]              | [kN]                | [kN]              | [kN]                | [kN]              | [kN]                |
|                    | 500       | <b>4,35</b>       | <b>1,73</b>         | <b>1,56</b>       | <b>0,64</b>         | <b>0,93</b>       | <b>0,38</b>         |
|                    | 1000      | <b>4,35</b>       | <b>0,75</b>         | <b>1,56</b>       | <b>0,31</b>         | <b>0,90</b>       | <b>0,18</b>         |
|                    | 1500      | <b>4,35</b>       | <b>0,40</b>         | <b>1,36</b>       | <b>0,18</b>         | <b>0,80</b>       | <b>0,11</b>         |



**Part List**  
2 x Beam Bracket TKO 100  
1 x Bracket Plates FV 100/120

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, max. deviation H/150; L/150; Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

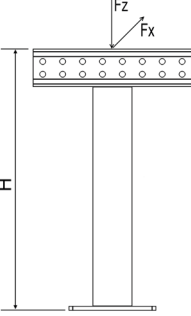
| Frame 100 | $L_{max}$ | 500               |                     | 1000              |                     | 2000              |                     |
|-----------|-----------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|           |           | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     |
|           |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| $H_{max}$ | [mm]      | [kN]              | [kN]                | [kN]              | [kN]                | [kN]              | [kN]                |
|           | 500       | <b>16,5</b>       | <b>15,1</b>         | <b>16,4</b>       | <b>15,0</b>         | <b>16,3</b>       | <b>9,9</b>          |
|           | 1000      | <b>16,5</b>       | <b>15,1</b>         | <b>16,4</b>       | <b>15,0</b>         | <b>16,3</b>       | <b>9,9</b>          |
|           | 1500      | <b>16,5</b>       | <b>15,1</b>         | <b>16,4</b>       | <b>15,0</b>         | <b>16,3</b>       | <b>9,9</b>          |



**Part List**  
3 x Beam Bracket TKO 100  
1 x End Support STA 100  
1 x Bracket Plates FV 100/120

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load; Max. bending L/150, max. deviation H/150; Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

| T-Support 100 | $H_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               |           | [kN]              | [kN]                |
|               | 200       | <b>13,0</b>       | <b>13,0</b>         |
|               | 600       | <b>13,0</b>       | <b>13,0</b>         |
|               | 1000      | <b>13,0</b>       | <b>13,0</b>         |
|               | 1400      | <b>13,0</b>       | <b>13,0</b>         |
|               | 2000      | <b>13,0</b>       | <b>9,5</b>          |

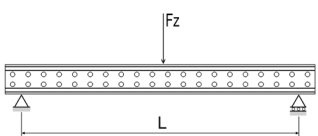


**Part List**  
1 x Beam Bracket TKO  
1 x T-Adapter TA 100

$F_z$  [kN] as a permanent load;  $F_x$  [kN] as a variable load, max. deviation H/150; central load introduction for planned eccentricity  $\pm 50$  mm; Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

## Working loads in accordance with Eurocode 3

### Beam Section 100

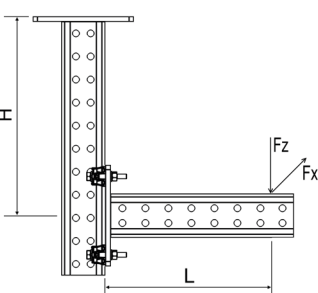


**Part List**  
Sikla-Beam Section H100

| $L_{max}$<br>[mm] | $F_{z, perm}$<br>[kN] |
|-------------------|-----------------------|
| 1000              | <b>50,0</b>           |
| 1600              | <b>31,0</b>           |
| 2000              | <b>24,5</b>           |
| 3000              | <b>15,0</b>           |
| 4000              | <b>10,5</b>           |
| 5000              | <b>7,8</b>            |
| 6000              | <b>5,9</b>            |

$F_z$  [kN] as a permanent load at L/2, Max. bending L/150.

### L-Construction 100

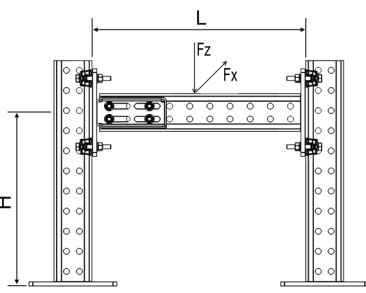


**Part List**  
2 x Beam Bracket TKO 100  
1 x Assembly Set MS 5P M12 S

| $L_{max}$<br>$H_{max}$<br>[mm] | $F_{z, perm}$ for |                             | $F_{z, perm}$ for |                             | $F_{z, perm}$ for |                             |
|--------------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
|                                | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
| 500                            | <b>3,51</b>       | <b>3,22</b>                 | <b>2,67</b>       | <b>1,54</b>                 | <b>2,13</b>       | <b>0,95</b>                 |
| 1000                           | <b>3,51</b>       | <b>0,96</b>                 | <b>2,67</b>       | <b>0,43</b>                 | <b>2,13</b>       | <b>0,27</b>                 |
| 1500                           | <b>3,51</b>       | <b>0,46</b>                 | <b>2,59</b>       | <b>0,22</b>                 | <b>1,79</b>       | <b>0,14</b>                 |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load; max. deviation H/150; L/150;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

### Frame 100

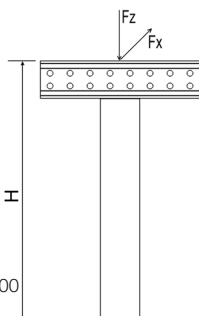


**Part List**  
3 x Beam Bracket TKO 100  
1 x End Support STA 100  
2 x Assembly Set MS 5P M12 S

| $L_{max}$<br>$H_{max}$<br>[mm] | $F_{z, perm}$ for |                             | $F_{z, perm}$ for |                             | $F_{z, perm}$ for |                             |
|--------------------------------|-------------------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
|                                | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
| 500                            | <b>8,2</b>        | <b>8,0</b>                  | <b>8,1</b>        | <b>7,9</b>                  | <b>8,0</b>        | <b>7,8</b>                  |
| 1000                           | <b>8,2</b>        | <b>8,0</b>                  | <b>8,1</b>        | <b>7,9</b>                  | <b>8,0</b>        | <b>7,8</b>                  |
| 1500                           | <b>8,2</b>        | <b>8,0</b>                  | <b>8,1</b>        | <b>7,9</b>                  | <b>8,0</b>        | <b>7,8</b>                  |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load;  
Max. bending L/150, max. deviation H/150;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

### T-Support 100



**Part List**  
1 x Beam Bracket TKO 100  
1 x T-Adapter TA 100

| $H_{max}$<br>[mm] | $F_{z, perm}$ for |                             |
|-------------------|-------------------|-----------------------------|
|                   | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
| 200               | <b>13,0</b>       | <b>13,0</b>                 |
| 600               | <b>13,0</b>       | <b>13,0</b>                 |
| 1000              | <b>13,0</b>       | <b>13,0</b>                 |
| 1400              | <b>13,0</b>       | <b>13,0</b>                 |
| 2000              | <b>13,0</b>       | <b>9,5</b>                  |

$F_z$  [kN] as a permanent load;  $F_x$  [kN] as a variable load, max. deviation H/150;  
central load introduction for planned eccentricity  $\pm 50$  mm;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

## Working loads in accordance with Eurocode 3

**Beam Bracket 100**

**Part List**  
1 Beam Bracket TKO 120

| $L_{max}$<br>[mm]                        | $F_{z, perm}$ for |                             |
|------------------------------------------|-------------------|-----------------------------|
|                                          | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
| Connection with Assembly Set MS 5P M12 S |                   |                             |
| 200                                      | <b>3,51</b>       | <b>3,22</b>                 |
| 400                                      | <b>3,03</b>       | <b>2,62</b>                 |
| 600                                      | <b>2,67</b>       | <b>2,21</b>                 |
| 800                                      | <b>2,37</b>       | <b>1,90</b>                 |
| 1000                                     | <b>2,13</b>       | <b>1,67</b>                 |
| 1400                                     | <b>1,76</b>       | <b>1,33</b>                 |
| 2000                                     | <b>1,36</b>       | <b>0,99</b>                 |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load; Max. bending  $L/150$ .

**Joining Beam Bracket 100**

**Part List**  
1 x Joining Beam Bracket QKOq

| $L_{max}$<br>[mm]                                | $F_{z, perm}$ for |                             |
|--------------------------------------------------|-------------------|-----------------------------|
|                                                  | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
| Connection with Assembly Set MS 5P M12 S / M16 S |                   |                             |
| 300                                              | <b>0,62</b>       | <b>0,61</b>                 |
| 500                                              | <b>0,37</b>       | <b>0,36</b>                 |
| 700                                              | <b>0,24</b>       | <b>0,24</b>                 |
| Connection with Bracket Plates                   |                   |                             |
| 300                                              | <b>1,48</b>       | <b>1,48</b>                 |
| 500                                              | <b>0,93</b>       | <b>0,93</b>                 |
| 700                                              | <b>0,66</b>       | <b>0,66</b>                 |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, max. deviation  $L/150$ ;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

**Angled Beam Bracket 100**

**Part List**  
1 x Beam Bracket TKO 100  
1 x Angled Beam Bracket SKO 100  
2 x Assembly Set MS 5P M12 S  
1 x Bracket Plates FV 100/120

| $L_{max}$<br>[mm]                           | $F_{z, perm}$ for |                             |
|---------------------------------------------|-------------------|-----------------------------|
|                                             | $F_x = 0$<br>[kN] | $F_x = \mu_0 * F_z$<br>[kN] |
| Inclined to the horizontal Bracket with 30° |                   |                             |
| 1000                                        | <b>2,70</b>       | <b>2,70</b>                 |
| 678                                         | <b>4,00</b>       | <b>4,00</b>                 |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, Max. bending  $L/150$ ;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

## Working loads in accordance with Eurocode 3

### Beam Section 120

**Part List**  
Sikla-Beam Section H120

| $L_{max}$<br>[mm] | $F_{z, perm}$<br>[kN] |
|-------------------|-----------------------|
| 1000              | <b>98,5</b>           |
| 1600              | <b>61,5</b>           |
| 2000              | <b>49,5</b>           |
| 3000              | <b>31,5</b>           |
| 4000              | <b>22,3</b>           |
| 5000              | <b>16,8</b>           |
| 6000              | <b>13,0</b>           |

$F_z$  [kN] as a permanent load at L/2; Max. bending L/150.

### L-Construction 120

**Part List**  
2 x Beam Bracket TKO 120  
1 x Bracket Plates FV 100/120

| $L_{max}$<br>$H_{max}$<br>[mm] | 200               |                     | 600               |                     | 1000              |                     |
|--------------------------------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|                                | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     |
|                                | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| 500                            | <b>4,35</b>       | <b>2,43</b>         | <b>1,59</b>       | <b>0,85</b>         | <b>0,96</b>       | <b>0,50</b>         |
| 1000                           | <b>4,35</b>       | <b>1,45</b>         | <b>1,59</b>       | <b>0,57</b>         | <b>0,96</b>       | <b>0,34</b>         |
| 1500                           | <b>4,35</b>       | <b>0,88</b>         | <b>1,59</b>       | <b>0,40</b>         | <b>0,96</b>       | <b>0,24</b>         |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, max. deviation H/150; L/150;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

### Frame 120

**Part List**  
3 x Beam Bracket TKO 120  
1 x End Support STA 120  
1 x Bracket Plates FV 100/120

| $L_{max}$<br>$H_{max}$<br>[mm] | 500               |                     | 1000              |                     | 2000              |                     |
|--------------------------------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|                                | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     |
|                                | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| 500                            | <b>16,5</b>       | <b>15,1</b>         | <b>16,3</b>       | <b>14,9</b>         | <b>16,1</b>       | <b>14,7</b>         |
| 1000                           | <b>16,5</b>       | <b>15,1</b>         | <b>16,3</b>       | <b>14,9</b>         | <b>16,1</b>       | <b>14,7</b>         |
| 1500                           | <b>16,5</b>       | <b>15,1</b>         | <b>16,3</b>       | <b>14,9</b>         | <b>16,1</b>       | <b>14,7</b>         |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load;  
Max. bending L/150, max. deviation H/150;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

### T-Support 120

**Part List**  
1 x Beam Bracket TKO 120  
1 x T-Adapter TA 120

| $H_{max}$<br>[mm] | $F_{z, perm}$ for |                     |
|-------------------|-------------------|---------------------|
|                   | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
| 200               | <b>23,6</b>       | <b>23,6</b>         |
| 600               | <b>23,6</b>       | <b>23,6</b>         |
| 1000              | <b>23,6</b>       | <b>23,6</b>         |
| 1400              | <b>23,6</b>       | <b>21,6</b>         |
| 2000              | <b>23,6</b>       | <b>15,9</b>         |

$F_z$  [kN] as a permanent load;  $F_x$  [kN] as a variable load, max. deviation H/150;  
central load introduction for planned eccentricity  $\pm 50$  mm;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

## Working loads in accordance with Eurocode 3

| Beam Section 120 | $L_{max}$   | $F_{z, perm}$ |
|------------------|-------------|---------------|
|                  | [mm]        | [kN]          |
|                  | 1000        | <b>98,5</b>   |
|                  | 1600        | <b>61,5</b>   |
|                  | 2000        | <b>49,5</b>   |
|                  | 3000        | <b>31,5</b>   |
|                  | 4000        | <b>22,3</b>   |
|                  | 5000        | <b>16,8</b>   |
| 6000             | <b>13,0</b> |               |

**Part List**  
Sikla-Beam Section H120

$F_z$  [kN] as a permanent load at L/2; Max. bending L/150.

| L-Construction 120 | $L_{max}$   | 200               |                     | 600               |                     | 1000              |                     |
|--------------------|-------------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|                    |             | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     |
|                    |             | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                    | $H_{max}$   | [kN]              | [kN]                | [kN]              | [kN]                | [kN]              | [kN]                |
|                    | [mm]        | [kN]              | [kN]                | [kN]              | [kN]                | [kN]              | [kN]                |
|                    | 500         | <b>3,61</b>       | <b>3,35</b>         | <b>2,86</b>       | <b>2,41</b>         | <b>2,34</b>       | <b>1,86</b>         |
|                    | 1000        | <b>3,61</b>       | <b>2,59</b>         | <b>2,86</b>       | <b>1,23</b>         | <b>2,34</b>       | <b>0,78</b>         |
| 1500               | <b>3,61</b> | <b>1,18</b>       | <b>2,86</b>         | <b>0,62</b>       | <b>2,34</b>         | <b>0,39</b>       |                     |

**Part List**  
2 x Beam Bracket TKO 120  
1 x Assembly Set MS 5P M12 S

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, max. deviation H/150; L/150;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

| Frame 120 | $L_{max}$  | 500               |                     | 1000              |                     | 2000              |                     |
|-----------|------------|-------------------|---------------------|-------------------|---------------------|-------------------|---------------------|
|           |            | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     | $F_{z, perm}$ for |                     |
|           |            | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|           | $H_{max}$  | [kN]              | [kN]                | [kN]              | [kN]                | [kN]              | [kN]                |
|           | [mm]       | [kN]              | [kN]                | [kN]              | [kN]                | [kN]              | [kN]                |
|           | 500        | <b>8,2</b>        | <b>8,0</b>          | <b>8,0</b>        | <b>7,8</b>          | <b>7,8</b>        | <b>7,6</b>          |
|           | 1000       | <b>8,2</b>        | <b>8,0</b>          | <b>8,0</b>        | <b>7,8</b>          | <b>7,8</b>        | <b>7,6</b>          |
| 1500      | <b>8,2</b> | <b>8,0</b>        | <b>8,0</b>          | <b>7,8</b>        | <b>7,8</b>          | <b>7,6</b>        |                     |

**Part List**  
3 x Beam Bracket TKO 120  
1 x End Support STA 120  
2 x Assembly Set MS 5P M12 S

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load;  
Max. bending L/150, max. deviation H/150;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

| T-Support 120 | $H_{max}$ | $F_{z, perm}$ for |                     |
|---------------|-----------|-------------------|---------------------|
|               |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|               | [mm]      | [kN]              | [kN]                |
|               | 200       | <b>23,6</b>       | <b>23,6</b>         |
|               | 600       | <b>23,6</b>       | <b>23,6</b>         |
|               | 1000      | <b>23,6</b>       | <b>23,6</b>         |
|               | 1400      | <b>23,6</b>       | <b>21,6</b>         |
|               | 2000      | <b>23,6</b>       | <b>15,9</b>         |

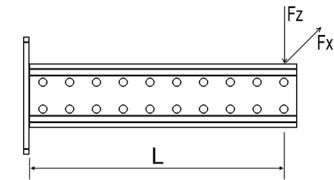
**Part List**  
1 x Beam Bracket TKO 120  
1 x T-Adapter TA 120

$F_z$  [kN] as a permanent load;  $F_x$  [kN] as a variable load, max. deviation H/150;  
central load introduction for planned eccentricity  $\pm 50$  mm;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).

Working loads in accordance with Eurocode 3

| Beam Bracket 120                         | $L_{max}$ | $F_{z, perm}$ for |                     |
|------------------------------------------|-----------|-------------------|---------------------|
|                                          |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                          | [mm]      | [kN]              | [kN]                |
| Connection with Assembly Set MS 5P M12 S |           |                   |                     |
|                                          | 200       | <b>3,61</b>       | <b>3,35</b>         |
|                                          | 400       | <b>3,20</b>       | <b>2,81</b>         |
|                                          | 600       | <b>2,86</b>       | <b>2,41</b>         |
|                                          | 800       | <b>2,57</b>       | <b>2,10</b>         |
|                                          | 1000      | <b>2,34</b>       | <b>1,86</b>         |
|                                          | 1400      | <b>1,95</b>       | <b>1,49</b>         |
|                                          | 2000      | <b>1,52</b>       | <b>1,12</b>         |

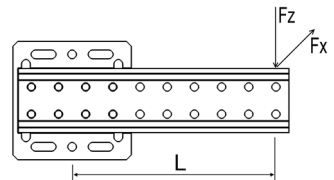
$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, Max. bending  $L/150$ .



**Part List**  
1 Beam Bracket TKO 120

| Joining Beam Bracket 120                         | $L_{max}$ | $F_{z, perm}$ for |                     |
|--------------------------------------------------|-----------|-------------------|---------------------|
|                                                  |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                                  | [mm]      | [kN]              | [kN]                |
| Connection with Assembly Set MS 5P M12 S / M16 S |           |                   |                     |
|                                                  | 300       | <b>0,72</b>       | <b>0,69</b>         |
|                                                  | 500       | <b>0,44</b>       | <b>0,40</b>         |
|                                                  | 700       | <b>0,29</b>       | <b>0,25</b>         |
| Connection with Bracket Plates                   |           |                   |                     |
|                                                  | 300       | <b>1,46</b>       | <b>1,46</b>         |
|                                                  | 500       | <b>0,90</b>       | <b>0,90</b>         |
|                                                  | 700       | <b>0,62</b>       | <b>0,62</b>         |

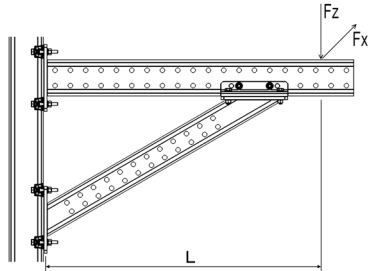
$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, max. deviation  $L/150$ ;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).



**Part List**  
1 x Joining Beam Bracket QKOq

| Angled Beam Bracket 120                     | $L_{max}$ | $F_{z, perm}$ for |                     |
|---------------------------------------------|-----------|-------------------|---------------------|
|                                             |           | $F_x = 0$         | $F_x = \mu_0 * F_z$ |
|                                             | [mm]      | [kN]              | [kN]                |
| Inclined to the horizontal Bracket with 30° |           |                   |                     |
|                                             | 1000      | <b>2,70</b>       | <b>2,70</b>         |
|                                             | 678       | <b>4,00</b>       | <b>4,00</b>         |

$F_z$  [kN] as a permanent load,  $F_x$  [kN] as a variable load, Max. bending  $L/150$ ;  
Friction coefficient  $\mu_0 = 0,2$  (for friction in longitudinal direction).



**Part List**  
1 x Beam Bracket TKO 120  
1 x Angled Beam Bracket SKO 100  
2 x Assembly Set MS 5P M12 S  
1 x Bracket Plates FV 100/120

### Supports (Pipe Shoes)

#### Application

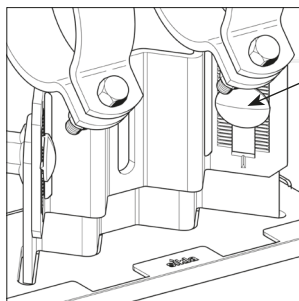
The Sikla height- adjustable Supports (Pipe Shoes; HV 90, HV 150, HV 200) can be used as a Skid, a Guide or as a Fixed Point. The testing process of the individual Support types and the determination of the direction dependent permissible loads was carried out by the independent testing house TÜV Rheinland (Report No. 69617494/01).

#### Conformity

The Sikla Simotec Supports (Pipe Shoes) therefore fulfill DIN EN 13480-3 : 2012-11, where particularly in section 13.3.6.1 it is highlighted that the design of Pipe Support components is in accordance with DIN EN 1993.

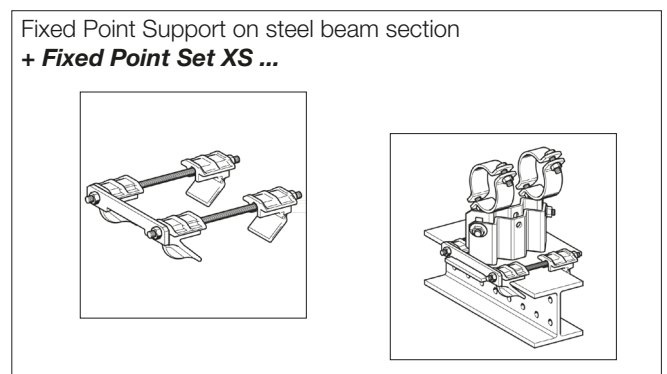
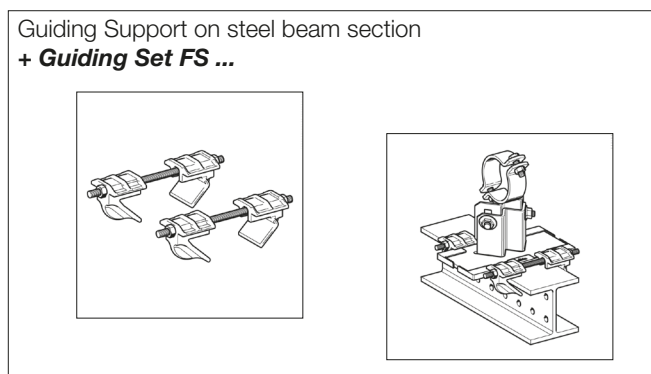
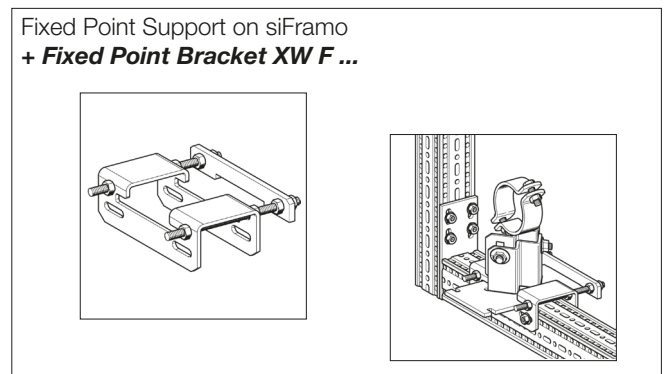
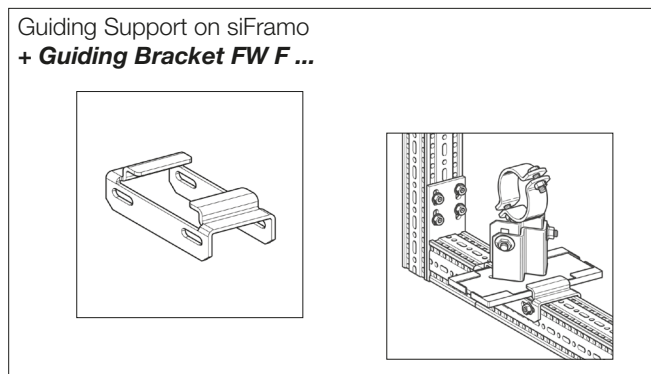
For every Pipe Support type (incl. required connection kit) a declaration of conformity could be issued in accordance with ISO / IEC 17050.

#### Installation



Special bolts for height- adjustable connection of lower and upper Pipe Shoe components.  
Tightening torque: 80 Nm

By combining **Pipe Shoe LA or LC** with the steel supporting structure and connecting parts below, it is possible to create a guided pipe shoe or a fixed point pipe shoe:



The dimension of the existing steel beam determines the required type of connection kit.  
Can be installed on steel beams with flange width  $\leq 300$  mm and flange thickness  $\leq 30$  mm.

## Notes on the following working load tables

The load values apply to pipe shoes from the HCP range as well as to the high temperature pipe shoes.  
The load values are based on room temperature.

For higher temperatures, the corresponding temperature correction values according to the attached table must be taken into account.

Axial fixed point forces  $F_x$  can only be attained by the professional use of anti-slip protections (e.g. cleats, stoppers). Those have to be planned during the design of the piping and are on the responsibility of the piping manufacturer. To use our fixed point sets, fixed point angles and axial stops, it is necessary to dismantle the sliding plate, so a friction value of  $\mu = 0.3$  should be taken into account for the pipe static consideration.

The tests for lifting forces -  $F_z$  were performed using a combination of a pipe shoe LA - HV and a guiding or fixed points sets.  
This results in the values for -  $F_z$  in the following combinations:

- beam connection with the **FS** guiding set or the **XS** fixed point set.
- cell Connection to siFramo with the guiding bracket **FW F** or the fixed point bracket **XW F**

Further statical product datas are available on request.



### Design temperatures of pipe support components

The media temperature  $t_f$  has an influence on the system of the pipe support components. Acc. to DIN EN 13480-3 „all components of the pipe support have to be designed based on a range of temperature from 0°C to 80°C. If the operational temperatures of the piping system are outside of this range, the corresponding values have to be specified.“

During the design of pipe supports, components are basically assigned into 2 groups: inside and outside of insulation.

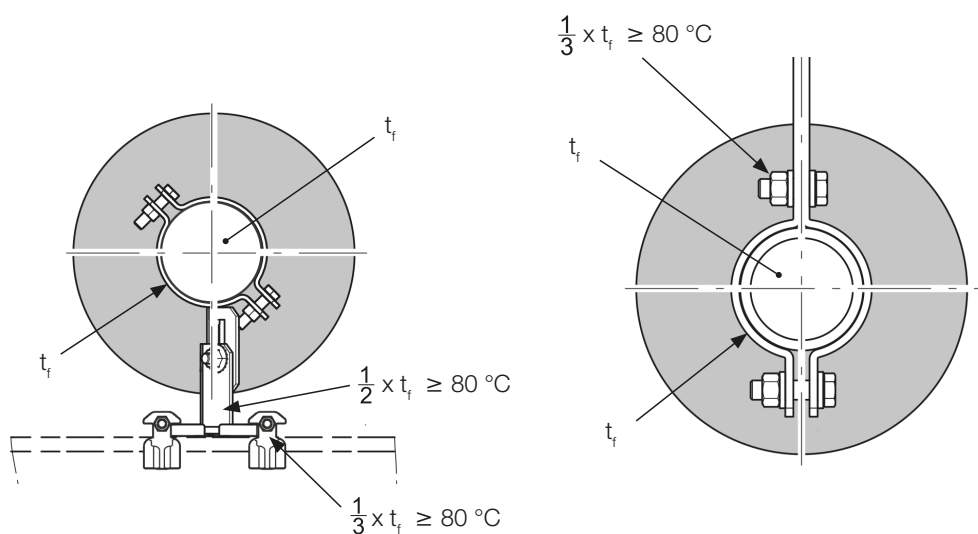
For all components being placed inside of an insulation the following values apply<sup>2</sup>:

| Kind of component                                                                     | Design temperature $t$ of the pipe support (depending on the media temperature $t_f$ ) |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Straps, pipe clamps and welded components with extensive contact to the piping system | $t = t_f$                                                                              |
| Components not in contact with the piping system                                      | $t = t_f - 20 \text{ °C}$                                                              |
| Bolts, nuts, etc.                                                                     | $t = t_f - 30 \text{ °C}$                                                              |

For all components being placed outside of the insulation the following values apply<sup>3</sup>:

| Kind of component                          | Media temperature $t_f$  | Design temperature $t$ of the pipe support  |
|--------------------------------------------|--------------------------|---------------------------------------------|
| Components in direct contact with the pipe | $t_f > 80 \text{ °C}$    | $t = \frac{1}{2} \times t_f$<br>(min. 80°C) |
|                                            | $t_f \leq 80 \text{ °C}$ | $t = 80 \text{ °C}$                         |
| Bolts, nuts, etc.                          | $t_f > 80 \text{ °C}$    | $t = \frac{1}{3} \times t_f$<br>(min. 80°C) |
|                                            | $t_f \leq 80 \text{ °C}$ | $t = 80 \text{ °C}$                         |

For clarification of the tables see the graphical illustration<sup>4</sup>:



<sup>1</sup> Compare EN 13480-3:2014-12, Table 13.3.1

<sup>2</sup> Compare EN 13480-3:2014-12, Chapter 13.3.2.2-1

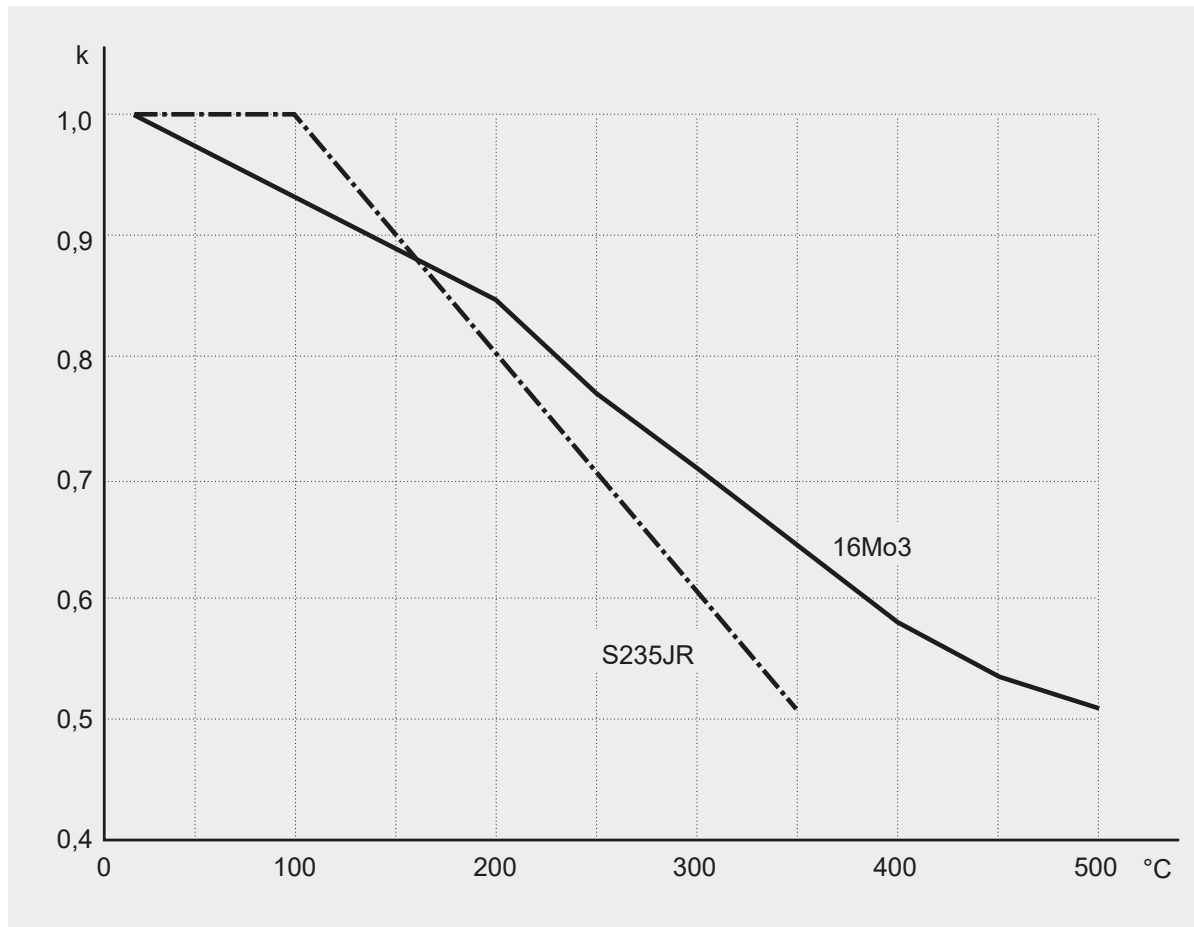
<sup>3</sup> Compare EN 13480-3:2014-12, Table 13.3.2-2

<sup>4</sup> Compare EN 13480-3:2014-12, Image 13.3.2-1

### Correction values for pipe support components

The working loads of the SIKLA pipe shoes LA, LC and LD as well as for the rod hangers are valid for component temperatures up to 80°C. If components are getting warmer than 80 °C in service, the stated working loads have to be added with the correction value k to reduce the working loads. Because SIKLA pipe support components are manufactured with steel grade S235JR (or higher), the appropriate correction value has to be applied.

Correction val k depending on the temperature:



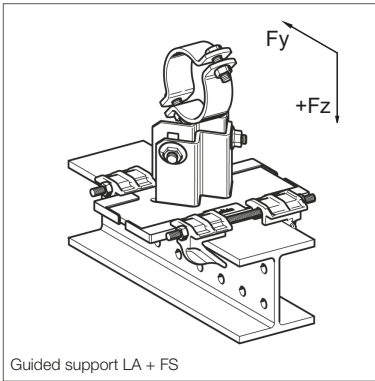
### Correction values and practical application

$$F_{perm} \geq F_{exist}$$

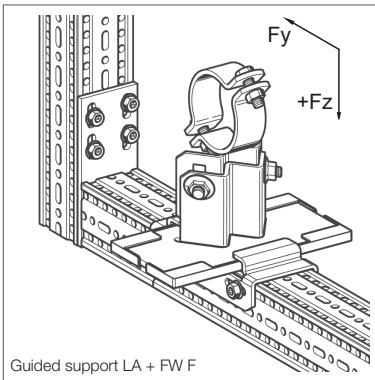
$$(F_{R,20°C} * k) \geq F_{exist}$$

- $F_{perm}$  permissible load of Sikla pipe shoe at temperature  $t_x$  [°C]
- $F_{exist}$  pipe load according to structural analysis
- $F_{R,20°C}$  permissible load of Sikla pipe shoe at 20 °C
- k correction value

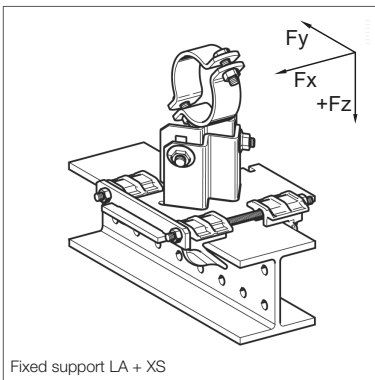
| Temperature t [°C] | Correction value k |        |
|--------------------|--------------------|--------|
|                    | 16Mo3              | S235JR |
| 20                 | 1.00               | 1.00   |
| 80                 | 0.95               | 1.00   |
| 100                | 0.93               | 1.00   |
| 150                | 0.89               | 0.90   |
| 200                | 0.85               | 0.81   |
| 250                | 0.77               | 0.71   |
| 300                | 0.71               | 0.61   |
| 350                | 0.64               | 0.52   |
| 400                | 0.58               | -      |
| 450                | 0.53               | -      |
| 500                | 0.51               | -      |



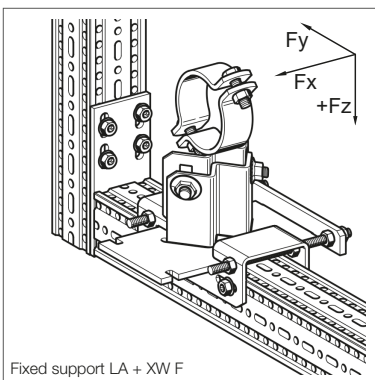
Guided support LA + FS



Guided support LA + FW F



Fixed support LA + XS



Fixed support LA + XW F

### Working loads for Pipe Shoes LA, LC and LD - HV / DN sizes

Pipe Shoe LA - HV + Guiding Set FS resp. Fixed Point Set XS

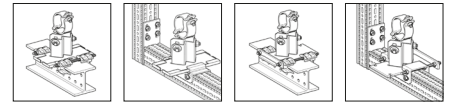
Pipe Shoe LA - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.

Please note the information on page 46 about the working loads.

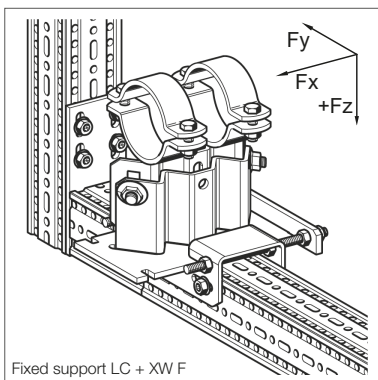
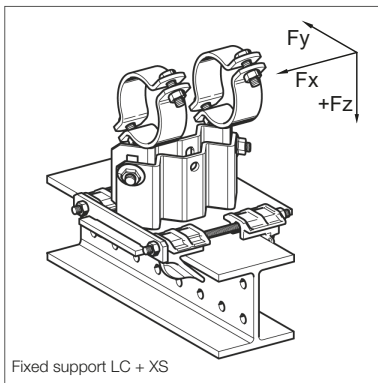
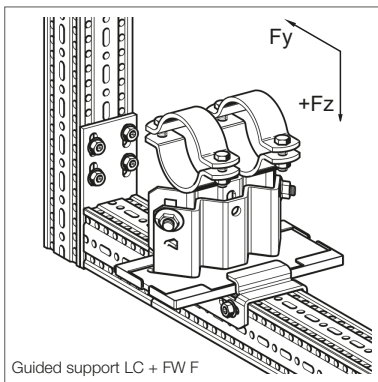
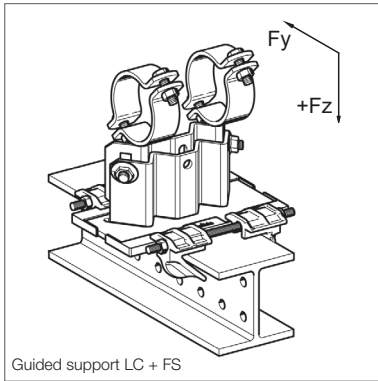
#### DN sizes

\* only for fixed supports



| LA - HV | DN   | $F_x^*$ [kN] | $F_y$ [kN] | $+F_z$ [kN] | $-F_z$ FS 80/120 [kN] | $-F_z$ FW F [kN] | $-F_z$ XS 80/120 [kN] | $-F_z$ XW F [kN] |
|---------|------|--------------|------------|-------------|-----------------------|------------------|-----------------------|------------------|
| 90      | ≤ 25 | 9.7          | 7.4        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 32   | 9.4          | 7.1        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 40   | 9.2          | 7          | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 50   | 8.8          | 6.7        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 65   | 8.3          | 6.2        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 80   | 7.9          | 5.9        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 100  | 7.1          | 5.1        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 125  | 6.3          | 4.4        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 90      | 150  | 5.4          | 3.6        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | ≤ 25 | 8.1          | 5.4        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 32   | 8            | 5.2        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 40   | 7.9          | 5.1        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 50   | 7.7          | 4.8        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 65   | 7.4          | 4.5        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 80   | 7.3          | 4.3        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 100  | 6.9          | 3.7        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 125  | 6.5          | 3.2        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 150     | 150  | 6.1          | 2.6        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | ≤ 25 | 6.6          | 4.9        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 32   | 6.4          | 4.7        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 40   | 6.4          | 4.7        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 50   | 6.3          | 4.5        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 65   | 6.1          | 4.2        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 80   | 6            | 4.1        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 100  | 5.7          | 3.7        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 125  | 5.4          | 3.3        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |
| 200     | 150  | 5.1          | 2.8        | 15.4        | 14                    | 6.1              | 15.4                  | 15.4             |



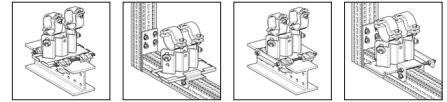


**Pipe Shoe LC - HV + Guiding Set FS resp. Fixed Point Set XS**  
**Pipe Shoe LC - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F**

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
 Please note the information on page 46 about the working loads.

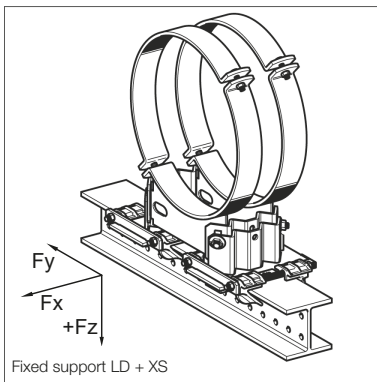
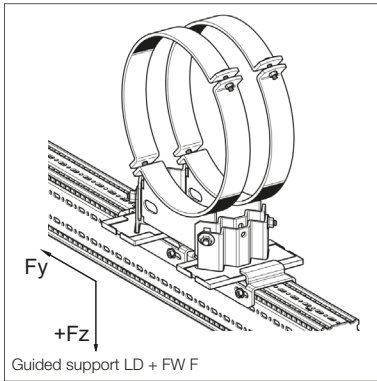
**DN sizes**

\* only for fixed supports



| LC - HV | DN   | $F_x^*$<br>[kN] | $F_y$<br>[kN] | $+F_z$<br>[kN] | $-F_z$<br>FS 80/120<br>[kN] | $-F_z$<br>FW F<br>[kN] | $-F_z$<br>XS 80/120<br>[kN] | $-F_z$<br>XW F<br>[kN] |
|---------|------|-----------------|---------------|----------------|-----------------------------|------------------------|-----------------------------|------------------------|
| 90      | ≤ 25 | 11.4            | 6.4           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 32   | 11.3            | 6.2           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 40   | 11.3            | 6.1           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 50   | 11.2            | 5.9           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 65   | 11.1            | 5.6           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 80   | 11.1            | 5.4           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 100  | 10.9            | 5             | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 125  | 10.8            | 4.6           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 150  | 10.6            | 4             | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 200  | 10.3            | 3.1           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 250  | 9.9             | 2.2           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 90      | 300  | 9.6             | 1.4           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | ≤ 25 | 8.6             | 4.7           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 32   | 8.6             | 4.6           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 40   | 8.6             | 4.6           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 50   | 8.5             | 4.4           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 65   | 8.5             | 4.2           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 80   | 8.5             | 4.1           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 100  | 8.4             | 3.8           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 125  | 8.3             | 3.5           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 150  | 8.3             | 3.2           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 200  | 8.1             | 2.7           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 250  | 8               | 2.1           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 150     | 300  | 7.9             | 1.5           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | ≤ 25 | 7.4             | 5             | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 32   | 7.4             | 4.9           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 40   | 7.4             | 4.8           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 50   | 7.4             | 4.7           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 65   | 7.3             | 4.5           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 80   | 7.3             | 4.4           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 100  | 7.3             | 4.1           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 125  | 7.2             | 3.8           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 150  | 7.2             | 3.5           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 200  | 7.1             | 2.9           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 250  | 7               | 2.3           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |
| 200     | 300  | 7               | 1.7           | 17.0           | 14                          | 6.1                    | 17                          | 17                     |





### Pipe Shoe LD - HV + 2 x Guiding Set FS resp. 2 x Fixed Point Set XS

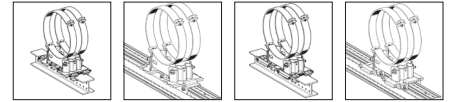
### Pipe Shoe LD - HV + 2 x Guiding Bracket FW F resp. 2 x Fixed Point Bracket XW F

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.

Please note the information on page 46 about the working loads.

#### DN sizes

\* only for fixed supports



| LD - HV | DN  | $F_x^*$<br>[kN] | $F_y$<br>[kN] | $+F_z$<br>[kN] | $-F_z$<br>FS 80/120<br>[kN] | $-F_z$<br>FW F<br>[kN] | $-F_z$<br>XS 80/120<br>[kN] | $-F_z$<br>XW F<br>[kN] |
|---------|-----|-----------------|---------------|----------------|-----------------------------|------------------------|-----------------------------|------------------------|
| 90      | 200 | 37,2            | 12,9          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 90      | 250 | 37,2            | 12,9          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 90      | 300 | 37,2            | 12,9          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 90      | 350 | 37,2            | 13,1          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 90      | 400 | 31,6            | 11,9          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 90      | 500 | 20,8            | 9,4           | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 90      | 600 | 9,5             | 7,2           | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 150     | 200 | 30,8            | 12,7          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 150     | 250 | 30,8            | 12,7          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 150     | 300 | 30,8            | 12,7          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 150     | 350 | 30,8            | 12,9          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 150     | 400 | 26,3            | 11,5          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 150     | 500 | 17,3            | 8,8           | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 150     | 600 | 8,1             | 6,3           | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 200     | 200 | 24,6            | 11,1          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 200     | 250 | 24,6            | 11,1          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 200     | 300 | 24,6            | 11,1          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 200     | 350 | 25              | 11,3          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 200     | 400 | 21,6            | 10,2          | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 200     | 500 | 15,7            | 8,1           | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |
| 200     | 600 | 9,5             | 6,1           | 32,8           | 28                          | 12,2                   | 32,8                        | 32,8                   |

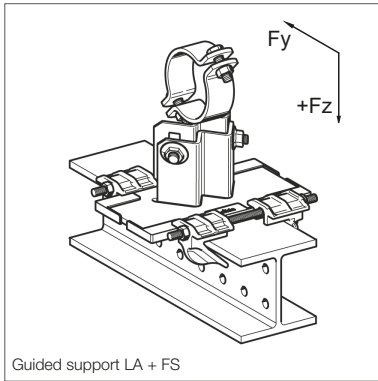
### Working loads for Pipe Shoes LA, LC and LD - HV

Pipe Shoe LA - HV + Guiding Set FS resp. Fixed Point Set XS

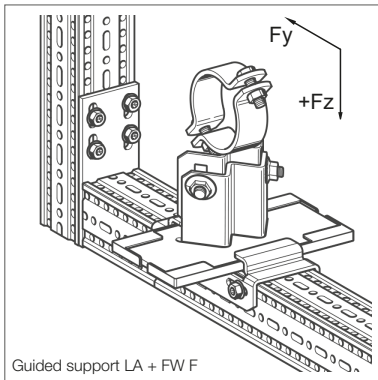
Pipe Shoe LA - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.

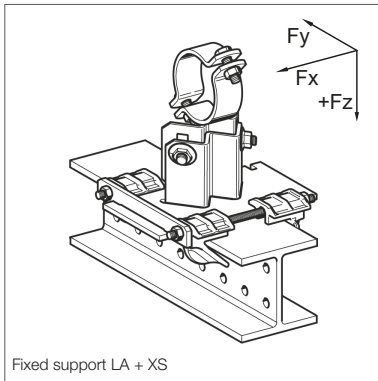
Please note the information on page 46 about the working loads.



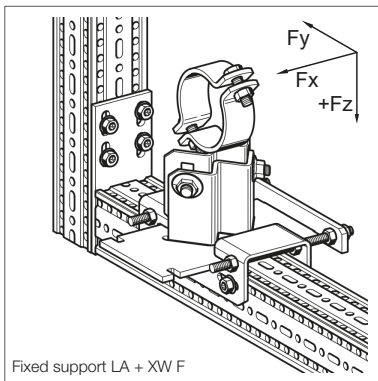
Guided support LA + FS



Guided support LA + FW F

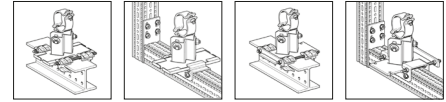


Fixed support LA + XS



Fixed support LA + XW F

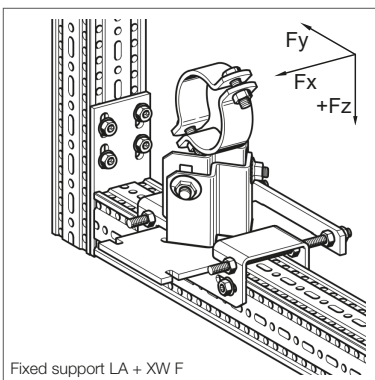
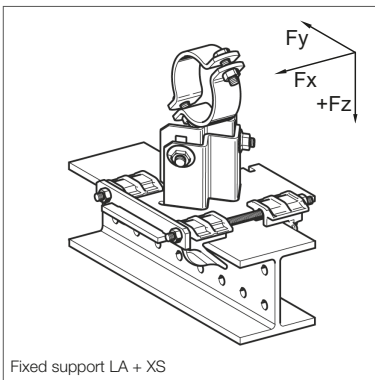
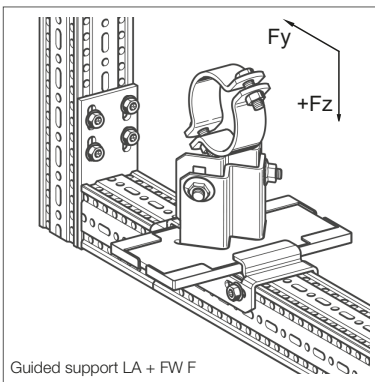
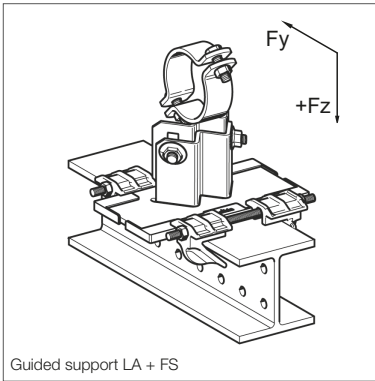
\* only for fixed supports



| LA - HV | D (pipe) [mm] | $F_x^*$ [kN] | $F_y$ [kN] | $+F_z$ [kN] | $-F_z$ FS 80/120 [kN] | $-F_z$ FW F 80 [kN] | $-F_z$ XS 80/120 [kN] | $-F_z$ XW F 80 [kN] |
|---------|---------------|--------------|------------|-------------|-----------------------|---------------------|-----------------------|---------------------|
| 90      | 14-18         | 9.7          | 7.4        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 18-22         | 9.7          | 7.4        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 23-27         | 9.7          | 7.4        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 26-30         | 9.7          | 7.4        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 30-34         | 9.7          | 7.4        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 35-39         | 9.5          | 7.3        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 40-44         | 9.4          | 7.1        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 45-49         | 9.2          | 7          | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 50-54         | 9.1          | 6.9        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 55-59         | 8.9          | 6.7        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 57-61         | 8.8          | 6.7        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 62-66         | 8.7          | 6.5        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 67-71         | 8.5          | 6.4        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 72-77         | 8.3          | 6.2        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 78-83         | 8.1          | 6          | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 84-89         | 7.9          | 5.9        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 89-95         | 7.7          | 5.7        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 96-102        | 7.5          | 5.5        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 102-109       | 7.3          | 5.3        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 109-115       | 7.1          | 5.1        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 115-122       | 6.9          | 4.9        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 122-128       | 6.7          | 4.8        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 128-134       | 6.5          | 4.6        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 134-140       | 6.3          | 4.4        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 140-146       | 6.1          | 4.3        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 146-152       | 5.9          | 4.1        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 152-158       | 5.7          | 3.9        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 157-163       | 5.5          | 3.8        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |
| 90      | 163-169       | 5.4          | 3.6        | 15.4        | 14                    | 6.1                 | 15.4                  | 15.4                |



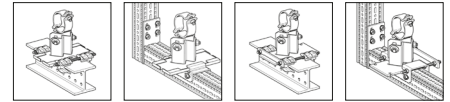
## Supports (Pipe Shoes)



### Pipe Shoe LA - HV + Guiding Set FS resp. Fixed Point Set XS Pipe Shoe LA - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F

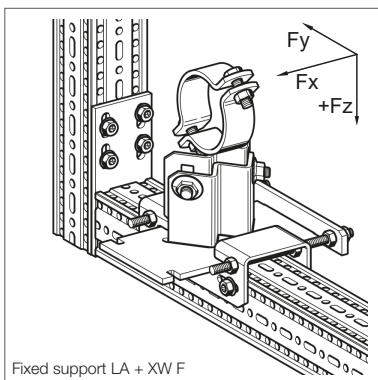
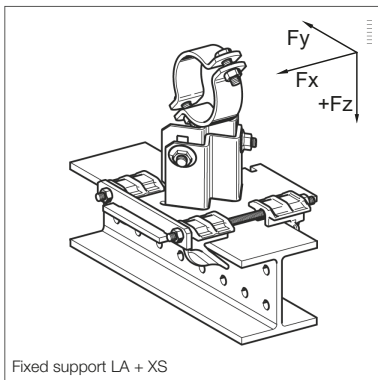
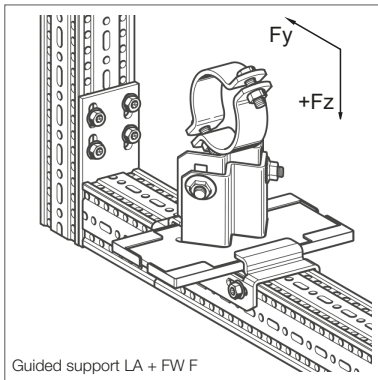
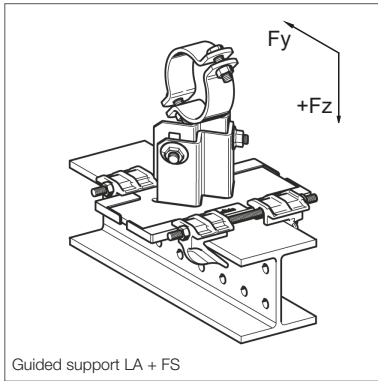
Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
Please note the information on page 46 about the working loads.

\* only for fixed supports



| LA - HV | D (pipe) [mm] | F <sub>x</sub> * [kN] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] | - F <sub>z</sub> FS 80/120 [kN] | - F <sub>z</sub> FW F 80 [kN] | - F <sub>z</sub> XS 80/120 [kN] | - F <sub>z</sub> XW F 80 [kN] |
|---------|---------------|-----------------------|---------------------|-----------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 150     | 14-18         | 8.1                   | 5.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 18-22         | 8.1                   | 5.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 23-27         | 8.1                   | 5.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 26-30         | 8.1                   | 5.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 30-34         | 8.1                   | 5.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 35-39         | 8.1                   | 5.3                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 40-44         | 8                     | 5.2                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 45-49         | 7.9                   | 5.1                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 50-54         | 7.8                   | 5                   | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 55-59         | 7.7                   | 4.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 57-61         | 7.7                   | 4.8                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 62-66         | 7.6                   | 4.7                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 67-71         | 7.5                   | 4.6                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 72-77         | 7.4                   | 4.5                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 78-83         | 7.4                   | 4.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 84-89         | 7.3                   | 4.3                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 89-95         | 7.2                   | 4.1                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 96-102        | 7.1                   | 4                   | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 102-109       | 6.9                   | 3.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 109-115       | 6.9                   | 3.7                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 115-122       | 6.7                   | 3.6                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 122-128       | 6.6                   | 3.5                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 128-134       | 6.5                   | 3.3                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 134-140       | 6.5                   | 3.2                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 140-146       | 6.4                   | 3.1                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 146-152       | 6.3                   | 3                   | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 152-158       | 6.2                   | 2.8                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 157-163       | 6.1                   | 2.7                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 150     | 163-169       | 6.1                   | 2.6                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |

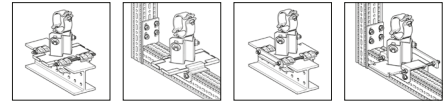




**Pipe Shoe LA - HV + Guiding Set FS resp. Fixed Point Set XS**  
**Pipe Shoe LA - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F**

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
 Please note the information on page 46 about the working loads.

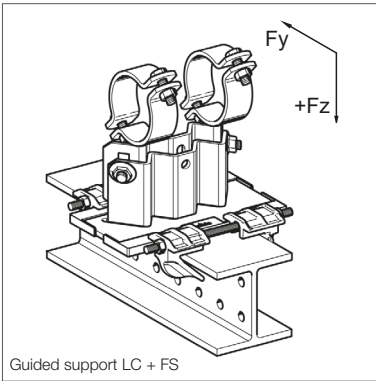
\* only for fixed supports



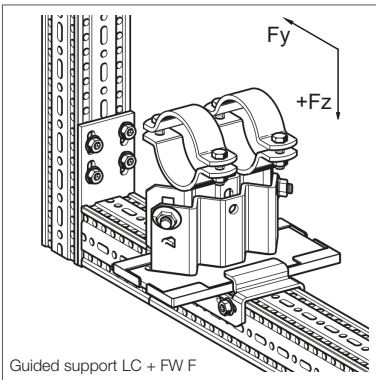
| LA - HV | D (pipe) [mm] | F <sub>x</sub> * [kN] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] | - F <sub>z</sub> FS 80/120 [kN] | - F <sub>z</sub> FW F 80 [kN] | - F <sub>z</sub> XS 80/120 [kN] | - F <sub>z</sub> XW F 80 [kN] |
|---------|---------------|-----------------------|---------------------|-----------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 200     | 14-18         | 6.6                   | 4.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 18-22         | 6.6                   | 4.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 23-27         | 6.6                   | 4.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 26-30         | 6.6                   | 4.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 30-34         | 6.6                   | 4.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 35-39         | 6.5                   | 4.8                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 40-44         | 6.4                   | 4.7                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 45-49         | 6.4                   | 4.7                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 50-54         | 6.3                   | 4.6                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 55-59         | 6.3                   | 4.5                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 57-61         | 6.3                   | 4.5                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 62-66         | 6.2                   | 4.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 67-71         | 6.2                   | 4.3                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 72-77         | 6.1                   | 4.2                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 78-83         | 6.0                   | 4.1                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 84-89         | 6.0                   | 4.1                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 89-95         | 5.9                   | 4.0                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 96-102        | 5.8                   | 3.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 102-109       | 5.7                   | 3.7                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 109-115       | 5.7                   | 3.7                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 115-122       | 5.6                   | 3.5                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 122-128       | 5.5                   | 3.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 128-134       | 5.5                   | 3.4                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 134-140       | 5.4                   | 3.3                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 140-146       | 5.3                   | 3.2                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 146-152       | 5.3                   | 3.1                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 152-158       | 5.2                   | 3.0                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 157-163       | 5.2                   | 2.9                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |
| 200     | 163-169       | 5.1                   | 2.8                 | 15.4                  | 14                              | 6.1                           | 15.4                            | 15.4                          |



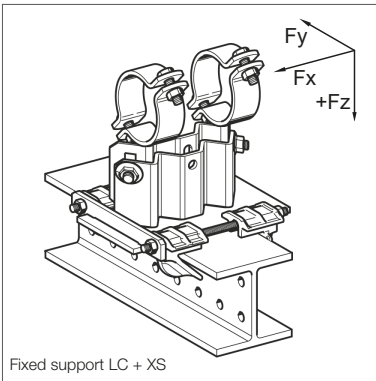




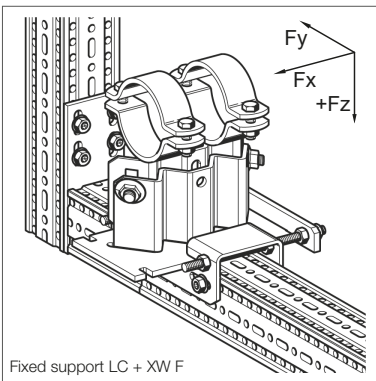
Guided support LC + FS



Guided support LC + FW F



Fixed support LC + XS

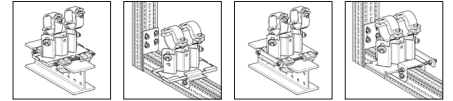


Fixed support LC + XW F

**Pipe Shoe LC - HV + Guiding Set FS resp. Fixed Point Set XS**  
**Pipe Shoe LC - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F**

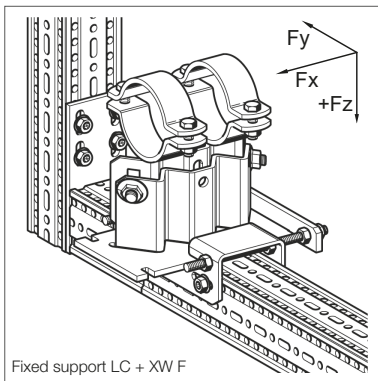
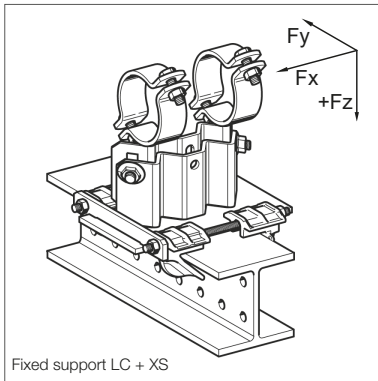
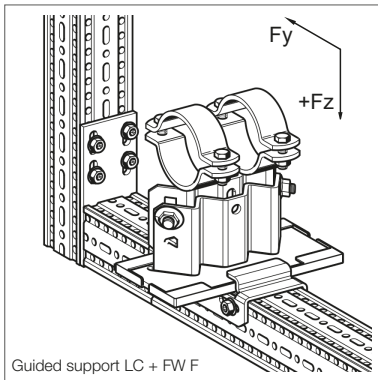
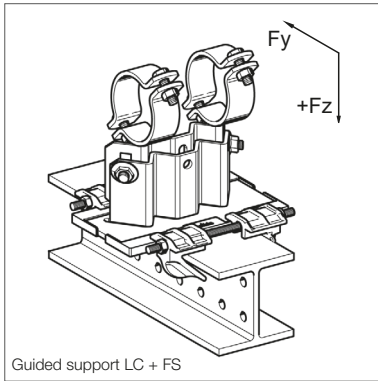
Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
 Please note the information on page 46 about the working loads.

\* only for fixed supports



| LC - HV | D (pipe) [mm] | F <sub>x</sub> * [kN] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] | - F <sub>z</sub> FS 80/120 [kN] | - F <sub>z</sub> FW F 80 [kN] | - F <sub>z</sub> XS 80/120 [kN] | - F <sub>z</sub> XW F 80 [kN] |
|---------|---------------|-----------------------|---------------------|-----------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 90      | 14-18         | 11.4                  | 6.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 18-22         | 11.4                  | 6.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 23-27         | 11.4                  | 6.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 26-30         | 11.4                  | 6.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 30-34         | 11.4                  | 6.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 35-39         | 11.4                  | 6.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 40-44         | 11.3                  | 6.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 45-49         | 11.3                  | 6.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 50-54         | 11.3                  | 6.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 55-59         | 11.2                  | 6.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 57-61         | 11.2                  | 5.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 62-66         | 11.2                  | 5.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 67-71         | 11.2                  | 5.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 72-77         | 11.1                  | 5.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 78-83         | 11.1                  | 5.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 84-89         | 11.1                  | 5.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 89-95         | 11.0                  | 5.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 96-102        | 11.0                  | 5.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 102-109       | 10.9                  | 5.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 109-115       | 10.9                  | 5.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 115-122       | 10.9                  | 4.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 122-128       | 10.8                  | 4.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 128-134       | 10.8                  | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 134-140       | 10.8                  | 4.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 140-146       | 10.7                  | 4.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 146-152       | 10.7                  | 4.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 152-158       | 10.6                  | 4.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 157-163       | 10.6                  | 4.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 163-169       | 10.6                  | 4.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 168-174       | 10.5                  | 4.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 174-180       | 10.5                  | 3.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 181-187       | 10.5                  | 3.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 188-194       | 10.4                  | 3.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 194-200       | 10.4                  | 3.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 201-207       | 10.3                  | 3.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 208-214       | 10.3                  | 3.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 215-221       | 10.3                  | 3.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 222-229       | 10.2                  | 3.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 230-237       | 10.2                  | 2.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 238-245       | 10.1                  | 2.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 246-254       | 10.1                  | 2.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 255-262       | 10.0                  | 2.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 259-266       | 10.0                  | 2.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 266-273       | 9.9                   | 2.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 274-282       | 9.9                   | 2.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 283-291       | 9.8                   | 1.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 292-300       | 9.8                   | 1.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 301-309       | 9.7                   | 1.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 310-317       | 9.7                   | 1.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 90      | 317-324       | 9.6                   | 1.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |

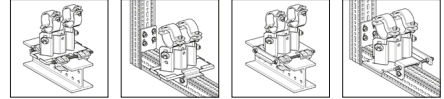




**Pipe Shoe LC - HV + Guiding Set FS resp. Fixed Point Set XS**  
**Pipe Shoe LC - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F**

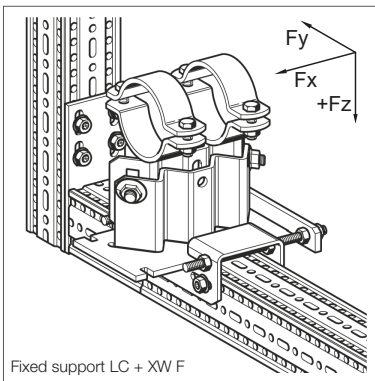
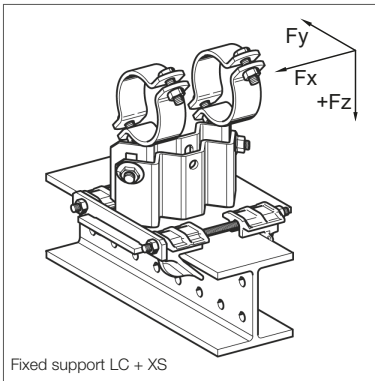
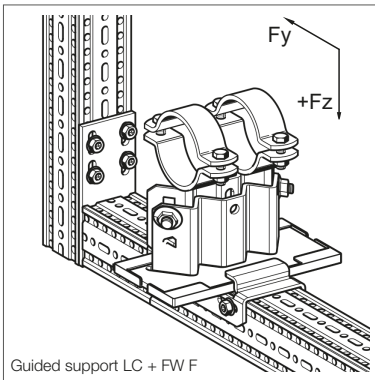
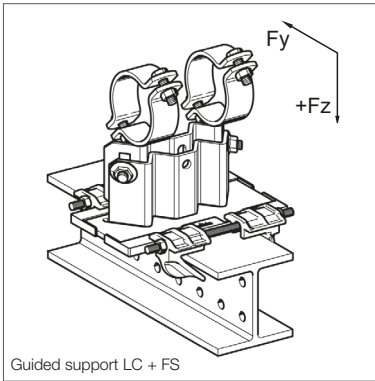
Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
 Please note the information on page 46 about the working loads.

\* only for fixed supports



| LC - HV | D (pipe) [mm] | F <sub>x</sub> * [kN] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] | - F <sub>z</sub> FS 80/120 [kN] | - F <sub>z</sub> FW F 80 [kN] | - F <sub>z</sub> XS 80/120 [kN] | - F <sub>z</sub> XW F 80 [kN] |
|---------|---------------|-----------------------|---------------------|-----------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 150     | 14-18         | 8.6                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 18-22         | 8.6                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 23-27         | 8.6                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 26-30         | 8.6                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 30-34         | 8.6                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 35-39         | 8.6                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 40-44         | 8.6                   | 4.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 45-49         | 8.6                   | 4.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 50-54         | 8.5                   | 4.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 55-59         | 8.5                   | 4.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 57-61         | 8.5                   | 4.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 62-66         | 8.5                   | 4.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 67-71         | 8.5                   | 4.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 72-77         | 8.5                   | 4.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 78-83         | 8.5                   | 4.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 84-89         | 8.5                   | 4.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 89-95         | 8.4                   | 4.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 96-102        | 8.4                   | 4.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 102-109       | 8.4                   | 3.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 109-115       | 8.4                   | 3.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 115-122       | 8.4                   | 3.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 122-128       | 8.4                   | 3.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 128-134       | 8.3                   | 3.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 134-140       | 8.3                   | 3.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 140-146       | 8.3                   | 3.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 146-152       | 8.3                   | 3.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 152-158       | 8.3                   | 3.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 157-163       | 8.3                   | 3.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 163-169       | 8.3                   | 3.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 168-174       | 8.2                   | 3.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 174-180       | 8.2                   | 3.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 181-187       | 8.2                   | 3.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 188-194       | 8.2                   | 3.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 194-200       | 8.2                   | 2.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 201-207       | 8.2                   | 2.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 208-214       | 8.2                   | 2.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 215-221       | 8.1                   | 2.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 222-229       | 8.1                   | 2.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 230-237       | 8.1                   | 2.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 238-245       | 8.1                   | 2.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 246-254       | 8.1                   | 2.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 255-262       | 8.0                   | 2.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 259-266       | 8.0                   | 2.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 266-273       | 8.0                   | 2.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 274-282       | 8.0                   | 2.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 283-291       | 8.0                   | 1.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 292-300       | 7.9                   | 1.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 301-309       | 7.9                   | 1.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 310-317       | 7.9                   | 1.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 150     | 317-324       | 7.9                   | 1.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |

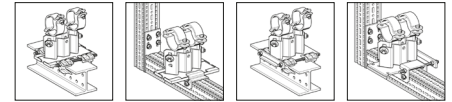




### Pipe Shoe LC - HV + Guiding Set FS resp. Fixed Point Set XS Pipe Shoe LC - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
Please note the information on page 46 about the working loads.

\* only for fixed supports

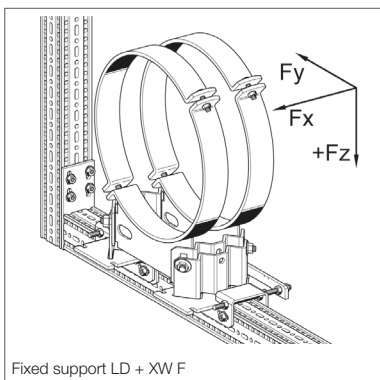
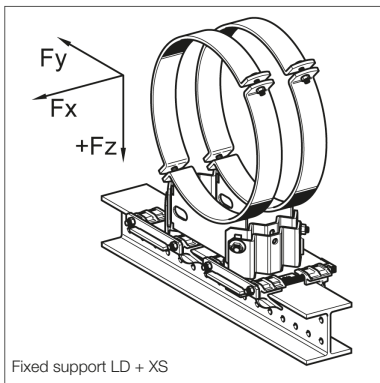
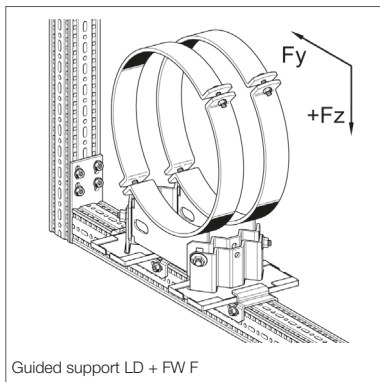
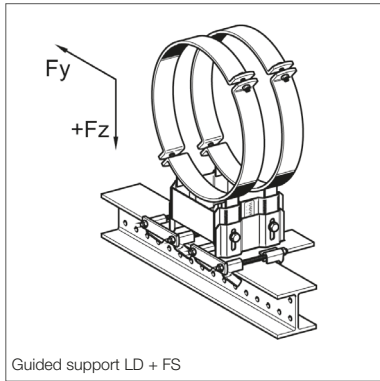


| LC - HV | D (pipe) [mm] | F <sub>x</sub> * [kN] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] | - F <sub>z</sub> FS 80/120 [kN] | - F <sub>z</sub> FW F 80 [kN] | - F <sub>z</sub> XS 80/120 [kN] | - F <sub>z</sub> XW F 80 [kN] |
|---------|---------------|-----------------------|---------------------|-----------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 200     | 14-18         | 7.4                   | 5.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 18-22         | 7.4                   | 5.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 23-27         | 7.4                   | 5.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 26-30         | 7.4                   | 5.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 30-34         | 7.4                   | 5.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 35-39         | 7.4                   | 4.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 40-44         | 7.4                   | 4.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 45-49         | 7.4                   | 4.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 50-54         | 7.4                   | 4.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 55-59         | 7.4                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 57-61         | 7.4                   | 4.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 62-66         | 7.3                   | 4.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 67-71         | 7.3                   | 4.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 72-77         | 7.3                   | 4.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 78-83         | 7.3                   | 4.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 84-89         | 7.3                   | 4.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 89-95         | 7.3                   | 4.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 96-102        | 7.3                   | 4.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 102-109       | 7.3                   | 4.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 109-115       | 7.3                   | 4.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 115-122       | 7.3                   | 4.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 122-128       | 7.3                   | 3.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 128-134       | 7.2                   | 3.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 134-140       | 7.2                   | 3.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 140-146       | 7.2                   | 3.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 146-152       | 7.2                   | 3.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 152-158       | 7.2                   | 3.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 157-163       | 7.2                   | 3.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 163-169       | 7.2                   | 3.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 168-174       | 7.2                   | 3.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 174-180       | 7.2                   | 3.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 181-187       | 7.2                   | 3.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 188-194       | 7.2                   | 3.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 194-200       | 7.1                   | 3.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 201-207       | 7.1                   | 3.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 208-214       | 7.1                   | 2.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 215-221       | 7.1                   | 2.9                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 222-229       | 7.1                   | 2.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 230-237       | 7.1                   | 2.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 238-245       | 7.1                   | 2.6                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 246-254       | 7.1                   | 2.5                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 255-262       | 7.0                   | 2.4                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 259-266       | 7.0                   | 2.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 266-273       | 7.0                   | 2.3                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 274-282       | 7.0                   | 2.2                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 283-291       | 7.0                   | 2.1                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 292-300       | 7.0                   | 2.0                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 301-309       | 7.0                   | 1.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 310-317       | 7.0                   | 1.8                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |
| 200     | 317-324       | 7.0                   | 1.7                 | 17                    | 14                              | 6.1                           | 17                              | 17                            |

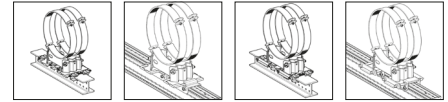


**Pipe Shoe LD - HV + 2 x Guiding Set FS resp. 2 x Fixed Point Set XS**  
**Pipe Shoe LD - HV + 2 x Guiding Bracket FW F resp. 2 x Fixed Point Bracket XW F**

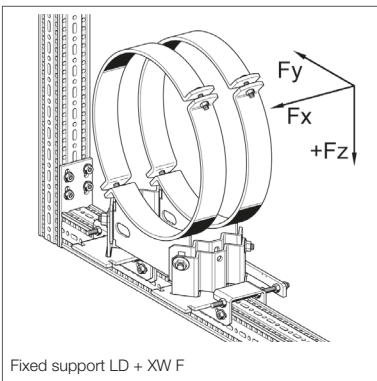
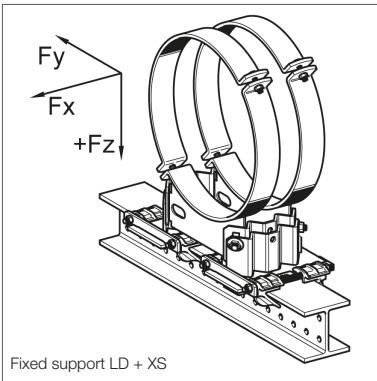
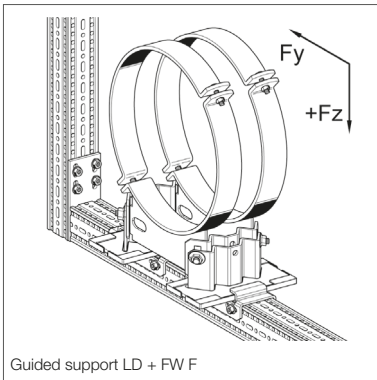
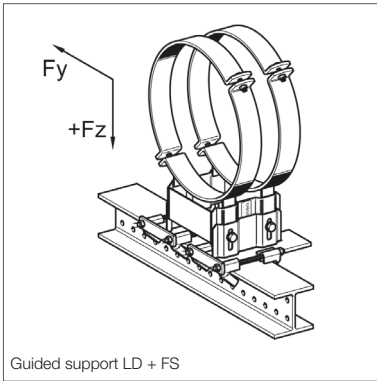
Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
 Please note the information on page 46 about the working loads.



\* only for fixed supports



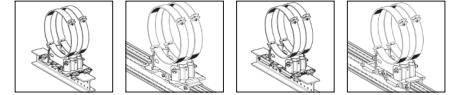
| LD - HV | D (pipe) [mm] | F <sub>x</sub> * [kN] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] | - F <sub>z</sub> FS 80/120 [kN] | - F <sub>z</sub> FW F 80 [kN] | - F <sub>z</sub> XS 80/120 [kN] | - F <sub>z</sub> XW F 80 [kN] |
|---------|---------------|-----------------------|---------------------|-----------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 90      | 215-221       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 222-229       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 230-237       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 238-245       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 246-254       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 255-262       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 259-266       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 266-273       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 274-282       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 283-291       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 292-300       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 301-309       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 310-317       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 317-324       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 325-333       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 334-342       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 343-350       | 37.2                  | 12.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 349-356       | 37.2                  | 13.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 358-365       | 36.2                  | 12.7                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 366-374       | 35.2                  | 12.5                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 375-382       | 34.3                  | 12.3                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 381-388       | 33.7                  | 12.2                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 389-396       | 32.8                  | 12.0                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 397-407       | 31.6                  | 11.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 408-418       | 30.4                  | 11.5                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 419-429       | 29.2                  | 11.2                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 430-440       | 28.0                  | 11.0                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 441-451       | 26.8                  | 10.7                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 447-457       | 26.2                  | 10.6                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 458-468       | 25.0                  | 10.3                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 467-477       | 24.0                  | 10.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 477-487       | 22.9                  | 9.9                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 488-498       | 21.7                  | 9.6                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 498-508       | 20.8                  | 9.4                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 509-519       | 19.4                  | 9.1                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 520-530       | 18.2                  | 8.9                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 531-541       | 17.0                  | 8.6                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 542-552       | 15.8                  | 8.3                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 553-563       | 14.6                  | 8.1                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 564-574       | 13.4                  | 7.8                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 575-585       | 12.2                  | 7.6                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 586-596       | 11.1                  | 7.3                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 594-604       | 10.2                  | 7.1                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 90      | 600-610       | 9.5                   | 7.2                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |



**Pipe Shoe LD - HV + 2 x Guiding Set FS resp. 2 x Fixed Point Set XS**  
**Pipe Shoe LD - HV + 2 x Guiding Bracket FW F resp. 2 x Fixed Point Bracket XW F**

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
 Please note the information on page 46 about the working loads.

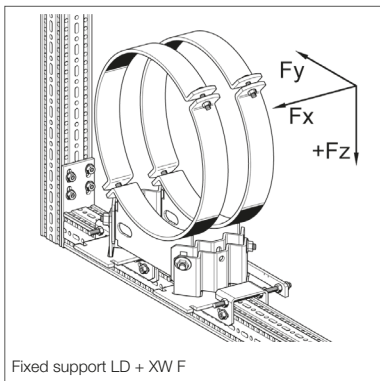
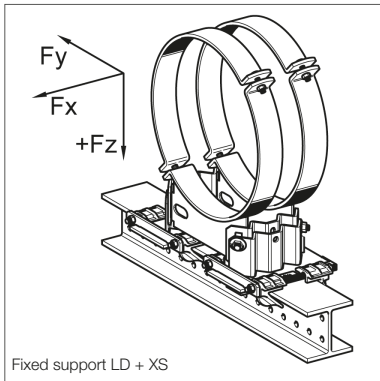
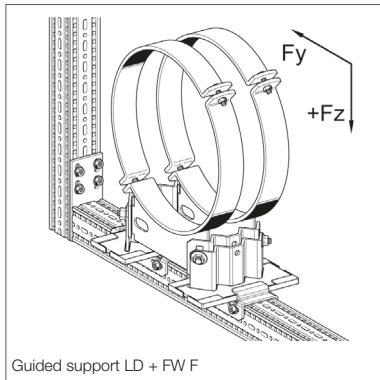
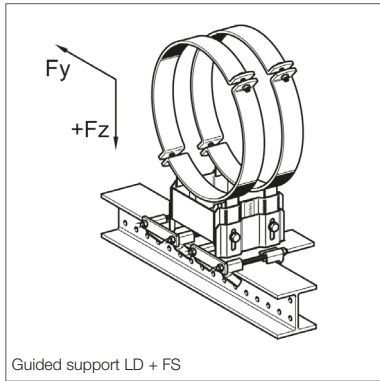
\* only for fixed supports



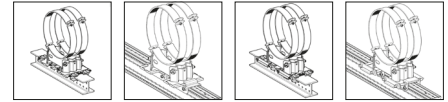
| LD - HV | D (pipe) [mm] | $F_x^*$ [kN] | $F_y$ [kN] | $+F_z$ [kN] | $-F_z$ FS 80/120 [kN] | $-F_z$ FW F 80 [kN] | $-F_z$ XS 80/120 [kN] | $-F_z$ XW F 80 [kN] |
|---------|---------------|--------------|------------|-------------|-----------------------|---------------------|-----------------------|---------------------|
| 150     | 215-221       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 222-229       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 230-237       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 238-245       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 246-254       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 255-262       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 259-266       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 266-273       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 274-282       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 283-291       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 292-300       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 301-309       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 310-317       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 317-324       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 325-333       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 334-342       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 343-350       | 30.8         | 12.7       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 349-356       | 30.8         | 12.9       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 358-365       | 30.8         | 12.4       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 366-374       | 29.2         | 12.2       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 375-382       | 28.5         | 12.0       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 381-388       | 28.0         | 11.8       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 389-396       | 27.2         | 11.6       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 397-407       | 26.3         | 11.5       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 408-418       | 25.3         | 11.1       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 419-429       | 24.3         | 10.8       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 430-440       | 23.3         | 10.5       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 441-451       | 22.3         | 10.2       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 447-457       | 21.8         | 10.0       | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 458-468       | 20.8         | 9.8        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 467-477       | 20.0         | 9.5        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 477-487       | 19.1         | 9.3        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 488-498       | 18.1         | 9.0        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 498-508       | 17.3         | 8.8        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 509-519       | 16.2         | 8.4        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 520-530       | 15.2         | 8.1        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 531-541       | 14.3         | 7.9        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 542-552       | 13.3         | 7.6        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 553-563       | 12.3         | 7.3        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 564-574       | 11.3         | 7.0        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 575-585       | 10.3         | 6.7        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 586-596       | 9.3          | 6.4        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 594-604       | 8.6          | 6.2        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |
| 150     | 600-610       | 8.1          | 6.3        | 32.8        | 28                    | 12.2                | 32.8                  | 32.8                |

**Pipe Shoe LD - HV + 2 x Guiding Set FS resp. 2 x Fixed Point Set XS**  
**Pipe Shoe LD - HV + 2 x Guiding Bracket FW F resp. 2 x Fixed Point Bracket XW F**

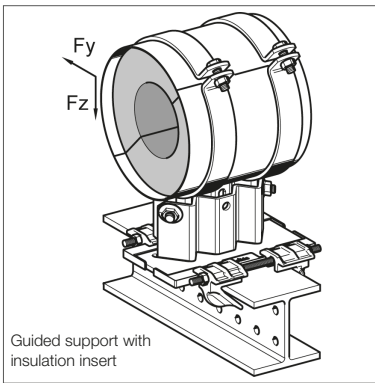
Basis of assessment EC 3, working loads for Pipe Shoes as delivered.  
 Please note the information on page 46 about the working loads.



\* only for fixed supports



| LD - HV | D (pipe) [mm] | F <sub>x</sub> * [kN] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] | - F <sub>z</sub> FS 80/120 [kN] | - F <sub>z</sub> FW F 80 [kN] | - F <sub>z</sub> XS 80/120 [kN] | - F <sub>z</sub> XW F 80 [kN] |
|---------|---------------|-----------------------|---------------------|-----------------------|---------------------------------|-------------------------------|---------------------------------|-------------------------------|
| 200     | 215-221       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 222-229       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 230-237       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 238-245       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 246-254       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 255-262       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 259-266       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 266-273       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 274-282       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 283-291       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 292-300       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 301-309       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 310-317       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 317-324       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 325-333       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 334-342       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 343-350       | 24.6                  | 11.1                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 349-356       | 25.0                  | 11.3                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 358-365       | 24.1                  | 10.9                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 366-374       | 23.5                  | 10.8                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 375-382       | 23.1                  | 10.6                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 381-388       | 22.7                  | 10.5                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 389-396       | 22.2                  | 10.3                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 397-407       | 21.6                  | 10.2                | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 408-418       | 20.9                  | 9.8                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 419-429       | 20.3                  | 9.6                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 430-440       | 19.6                  | 9.4                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 441-451       | 19.0                  | 9.2                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 447-457       | 18.6                  | 9.0                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 458-468       | 17.9                  | 8.8                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 467-477       | 17.4                  | 8.6                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 477-487       | 16.8                  | 8.4                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 488-498       | 16.1                  | 8.2                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 498-508       | 15.7                  | 8.1                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 509-519       | 14.9                  | 7.8                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 520-530       | 14.2                  | 7.5                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 531-541       | 13.6                  | 7.3                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 542-552       | 12.9                  | 7.1                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 553-563       | 12.3                  | 6.9                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 564-574       | 11.6                  | 6.6                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 575-585       | 11.0                  | 6.4                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 586-596       | 10.3                  | 6.2                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 594-604       | 9.8                   | 6.0                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |
| 200     | 600-610       | 9.5                   | 6.1                 | 32.8                  | 28                              | 12.2                          | 32.8                            | 32.8                          |



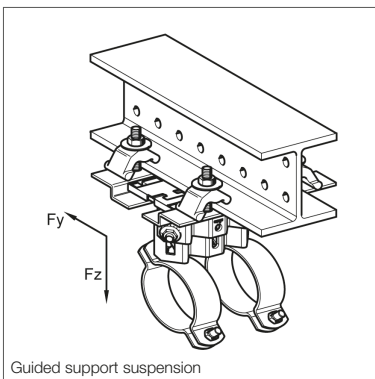
### Working loads for Supports with insulation insert and suspension

#### Pipe Shoe LK - HV + Guiding Set FS 80/120

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.

Please note the information on page 46 about the working loads.

| LK - HV | D (pipe) [mm] | $F_y$ [kN] | + $F_z$ [kN] |
|---------|---------------|------------|--------------|
| 150     | 33,7          | 3.1        | 3.1          |
| 150     | 42,4          | 3.8        | 3.8          |
| 150     | 48,3          | 4.3        | 4.3          |
| 150     | 60,3          | 4.0        | 3.9          |
| 150     | 76,1          | 2.8        | 2.8          |
| 150     | 88,9          | 2.5        | 2.4          |
| 150     | 114,3         | 4.5        | 14.0         |
| 150     | 139,7         | 4.1        | 14.0         |
| 150     | 168,3         | 3.6        | 14.0         |
| 150     | 219,1         | 2.8        | 14.0         |
| 150     | 273,0         | 1.9        | 14.0         |
| 150     | 323,9         | 0.4        | 14.0         |



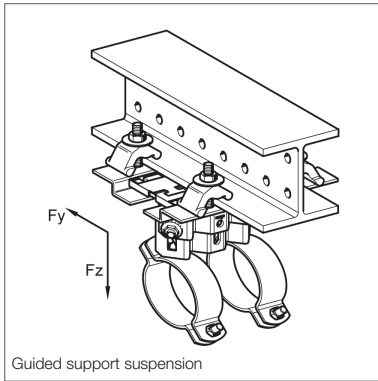
#### Pipe Shoe LA / LC / LD - HV 90 + Guiding Set FS Z 80/120

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.

Please note the information on page 46 about the working loads.

| LA / LC / LD - HV | D (pipe) [mm] | $F_y$ [kN] | + $F_z$ [kN] |
|-------------------|---------------|------------|--------------|
| 90                | 14-18         | 5.0        | 10.0         |
| 90                | 18-22         | 4.9        | 10.0         |
| 90                | 23-27         | 4.9        | 10.0         |
| 90                | 26-30         | 4.8        | 10.0         |
| 90                | 30-34         | 4.8        | 10.0         |
| 90                | 35-39         | 4.7        | 10.0         |
| 90                | 40-44         | 4.7        | 10.0         |
| 90                | 45-49         | 4.6        | 10.0         |
| 90                | 50-54         | 4.5        | 10.0         |
| 90                | 55-59         | 4.5        | 10.0         |
| 90                | 57-61         | 4.5        | 10.0         |
| 90                | 62-66         | 4.4        | 10.0         |
| 90                | 67-71         | 4.3        | 10.0         |
| 90                | 72-77         | 4.3        | 10.0         |
| 90                | 78-83         | 4.2        | 10.0         |
| 90                | 84-89         | 4.1        | 10.0         |
| 90                | 89-95         | 4.1        | 10.0         |
| 90                | 96-102        | 4.0        | 10.0         |
| 90                | 102-109       | 3.9        | 10.0         |
| 90                | 109-115       | 3.8        | 10.0         |
| 90                | 115-122       | 3.8        | 10.0         |
| 90                | 122-128       | 3.7        | 10.0         |
| 90                | 128-134       | 3.6        | 10.0         |
| 90                | 134-140       | 3.5        | 10.0         |
| 90                | 140-146       | 3.5        | 10.0         |

| LA / LC / LD - HV | D (pipe) [mm] | $F_y$ [kN] | + $F_z$ [kN] |
|-------------------|---------------|------------|--------------|
| 90                | 146-152       | 3.4        | 10.0         |
| 90                | 152-158       | 3.3        | 10.0         |
| 90                | 157-163       | 3.3        | 10.0         |
| 90                | 163-169       | 3.2        | 10.0         |
| 90                | 168-174       | 3.2        | 10.0         |
| 90                | 174-180       | 3.1        | 10.0         |
| 90                | 181-187       | 3.0        | 10.0         |
| 90                | 188-194       | 2.9        | 10.0         |
| 90                | 194-200       | 2.9        | 10.0         |
| 90                | 201-207       | 2.8        | 10.0         |
| 90                | 208-214       | 2.7        | 10.0         |
| 90                | 215-221       | 2.6        | 10.0         |
| 90                | 222-229       | 2.5        | 10.0         |
| 90                | 230-237       | 2.4        | 10.0         |
| 90                | 238-245       | 2.3        | 10.0         |
| 90                | 246-254       | 2.2        | 10.0         |
| 90                | 255-262       | 2.1        | 10.0         |
| 90                | 259-266       | 2.1        | 10.0         |
| 90                | 266-273       | 2.0        | 10.0         |
| 90                | 274-282       | 1.9        | 10.0         |
| 90                | 283-291       | 1.8        | 10.0         |
| 90                | 292-300       | 1.7        | 10.0         |
| 90                | 301-309       | 1.6        | 10.0         |
| 90                | 310-317       | 1.5        | 10.0         |
| 90                | 317-324       | 1.4        | 10.0         |



### Working loads for Supports with insulation insert and suspension

#### Pipe Shoe LA / LC / LD - HV 150 + Guiding Set FS Z 80/120

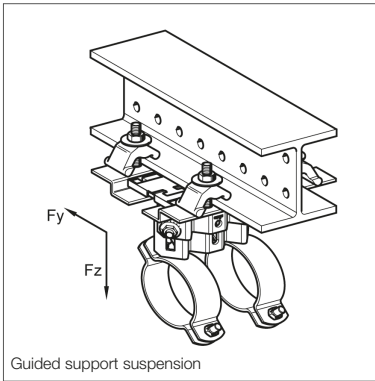
Basis of assessment EC 3, working loads for Pipe Shoes as delivered.

Please note the information on page 46 about the working loads.

| LA / LC / LD<br>- HV | D (pipe)<br>[mm] | F <sub>y</sub><br>[kN] | + F <sub>z</sub><br>[kN] |
|----------------------|------------------|------------------------|--------------------------|
| 150                  | 14-18            | 3.3                    | 10.0                     |
| 150                  | 18-22            | 3.2                    | 10.0                     |
| 150                  | 23-27            | 3.2                    | 10.0                     |
| 150                  | 26-30            | 3.2                    | 10.0                     |
| 150                  | 30-34            | 3.1                    | 10.0                     |
| 150                  | 35-39            | 3.1                    | 10.0                     |
| 150                  | 40-44            | 3.1                    | 10.0                     |
| 150                  | 45-49            | 3.1                    | 10.0                     |
| 150                  | 50-54            | 3.0                    | 10.0                     |
| 150                  | 55-59            | 3.0                    | 10.0                     |
| 150                  | 57-61            | 3.0                    | 10.0                     |
| 150                  | 62-66            | 2.9                    | 10.0                     |
| 150                  | 67-71            | 2.9                    | 10.0                     |
| 150                  | 72-77            | 2.9                    | 10.0                     |
| 150                  | 78-83            | 2.8                    | 10.0                     |
| 150                  | 84-89            | 2.8                    | 10.0                     |
| 150                  | 89-95            | 2.8                    | 10.0                     |
| 150                  | 96-102           | 2.7                    | 10.0                     |
| 150                  | 102-109          | 2.7                    | 10.0                     |
| 150                  | 109-115          | 2.6                    | 10.0                     |
| 150                  | 115-122          | 2.6                    | 10.0                     |
| 150                  | 122-128          | 2.6                    | 10.0                     |
| 150                  | 128-134          | 2.5                    | 10.0                     |
| 150                  | 134-140          | 2.5                    | 10.0                     |
| 150                  | 140-146          | 2.4                    | 10.0                     |

| LA / LC / LD<br>- HV | D (pipe)<br>[mm] | F <sub>y</sub><br>[kN] | + F <sub>z</sub><br>[kN] |
|----------------------|------------------|------------------------|--------------------------|
| 150                  | 146-152          | 2.4                    | 10.0                     |
| 150                  | 152-158          | 2.4                    | 10.0                     |
| 150                  | 157-163          | 2.3                    | 10.0                     |
| 150                  | 163-169          | 2.3                    | 10.0                     |
| 150                  | 168-174          | 2.3                    | 10.0                     |
| 150                  | 174-180          | 2.2                    | 10.0                     |
| 150                  | 181-187          | 2.2                    | 10.0                     |
| 150                  | 188-194          | 2.1                    | 10.0                     |
| 150                  | 194-200          | 2.1                    | 10.0                     |
| 150                  | 201-207          | 2.1                    | 10.0                     |
| 150                  | 208-214          | 2.0                    | 10.0                     |
| 150                  | 215-221          | 2.0                    | 10.0                     |
| 150                  | 222-229          | 1.9                    | 10.0                     |
| 150                  | 230-237          | 1.9                    | 10.0                     |
| 150                  | 238-245          | 1.8                    | 10.0                     |
| 150                  | 246-254          | 1.8                    | 10.0                     |
| 150                  | 255-262          | 1.7                    | 10.0                     |
| 150                  | 259-266          | 1.7                    | 10.0                     |
| 150                  | 266-273          | 1.6                    | 10.0                     |
| 150                  | 274-282          | 1.6                    | 10.0                     |
| 150                  | 283-291          | 1.5                    | 10.0                     |
| 150                  | 292-300          | 1.5                    | 10.0                     |
| 150                  | 301-309          | 1.4                    | 10.0                     |
| 150                  | 310-317          | 1.4                    | 10.0                     |
| 150                  | 317-324          | 1.3                    | 10.0                     |





### Working loads for Supports with insulation insert and suspension

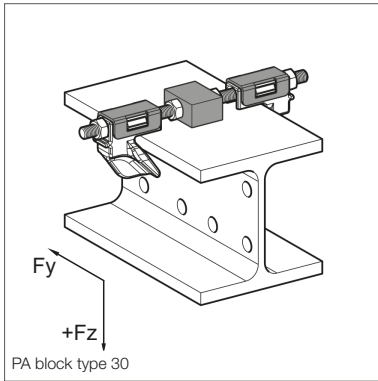
#### Pipe Shoe LA / LC / LD - HV 200 + Guiding Set FS Z 80/120

Basis of assessment EC 3, working loads for Pipe Shoes as delivered.

Please note the information on page 46 about the working loads.

| LA / LC / LD - HV | D (pipe) [mm] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] |
|-------------------|---------------|---------------------|-----------------------|
| 200               | 14-18         | 2.5                 | 10.0                  |
| 200               | 18-22         | 2.5                 | 10.0                  |
| 200               | 23-27         | 2.5                 | 10.0                  |
| 200               | 26-30         | 2.5                 | 10.0                  |
| 200               | 30-34         | 2.5                 | 10.0                  |
| 200               | 35-39         | 2.4                 | 10.0                  |
| 200               | 40-44         | 2.4                 | 10.0                  |
| 200               | 45-49         | 2.4                 | 10.0                  |
| 200               | 50-54         | 2.4                 | 10.0                  |
| 200               | 55-59         | 2.3                 | 10.0                  |
| 200               | 57-61         | 2.3                 | 10.0                  |
| 200               | 62-66         | 2.3                 | 10.0                  |
| 200               | 67-71         | 2.3                 | 10.0                  |
| 200               | 72-77         | 2.3                 | 10.0                  |
| 200               | 78-83         | 2.2                 | 10.0                  |
| 200               | 84-89         | 2.2                 | 10.0                  |
| 200               | 89-95         | 2.2                 | 10.0                  |
| 200               | 96-102        | 2.2                 | 10.0                  |
| 200               | 102-109       | 2.1                 | 10.0                  |
| 200               | 109-115       | 2.1                 | 10.0                  |
| 200               | 115-122       | 2.1                 | 10.0                  |
| 200               | 122-128       | 2.0                 | 10.0                  |
| 200               | 128-134       | 2.0                 | 10.0                  |
| 200               | 134-140       | 2.0                 | 10.0                  |
| 200               | 140-146       | 2.0                 | 10.0                  |

| LA / LC / LD - HV | D (pipe) [mm] | F <sub>y</sub> [kN] | + F <sub>z</sub> [kN] |
|-------------------|---------------|---------------------|-----------------------|
| 200               | 146-152       | 1.9                 | 10.0                  |
| 200               | 152-158       | 1.9                 | 10.0                  |
| 200               | 157-163       | 1.9                 | 10.0                  |
| 200               | 163-169       | 1.9                 | 10.0                  |
| 200               | 168-174       | 1.9                 | 10.0                  |
| 200               | 174-180       | 1.8                 | 10.0                  |
| 200               | 181-187       | 1.8                 | 10.0                  |
| 200               | 188-194       | 1.8                 | 10.0                  |
| 200               | 194-200       | 1.7                 | 10.0                  |
| 200               | 201-207       | 1.7                 | 10.0                  |
| 200               | 208-214       | 1.7                 | 10.0                  |
| 200               | 215-221       | 1.6                 | 10.0                  |
| 200               | 222-229       | 1.6                 | 10.0                  |
| 200               | 230-237       | 1.6                 | 10.0                  |
| 200               | 238-245       | 1.5                 | 10.0                  |
| 200               | 246-254       | 1.5                 | 10.0                  |
| 200               | 255-262       | 1.5                 | 10.0                  |
| 200               | 259-266       | 1.5                 | 10.0                  |
| 200               | 266-273       | 1.4                 | 10.0                  |
| 200               | 274-282       | 1.4                 | 10.0                  |
| 200               | 283-291       | 1.3                 | 10.0                  |
| 200               | 292-300       | 1.3                 | 10.0                  |
| 200               | 301-309       | 1.3                 | 10.0                  |
| 200               | 310-317       | 1.2                 | 10.0                  |
| 200               | 317-324       | 1.2                 | 10.0                  |

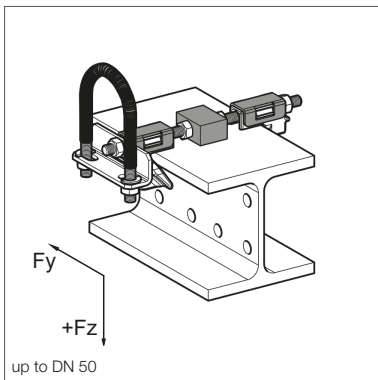
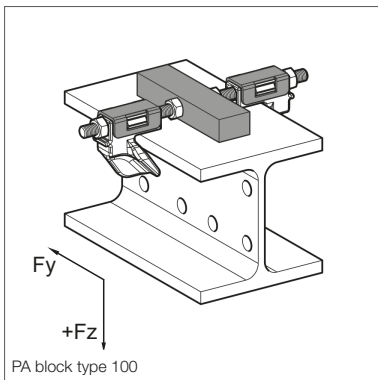


### Working loads for sliding supports LR - H 20, guided supports FR - H 20 and fixed points XR - H 20

Design according to EN 13480-3 Annex J

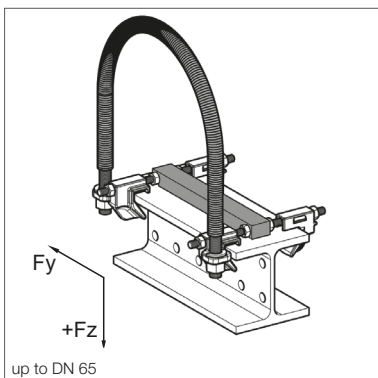
#### Sliding support LR - 20 with slide bar type 30 and type 100

| DN  | + F <sub>z</sub><br>[kN] |
|-----|--------------------------|
| 15  | 4,5                      |
| 20  | 4,5                      |
| 25  | 4,5                      |
| 32  | 4,5                      |
| 40  | 4,5                      |
| 50  | 4,5                      |
| 65  | 9,0                      |
| 80  | 9,0                      |
| 100 | 9,0                      |
| 125 | 9,0                      |
| 150 | 9,0                      |
| 175 | 9,0                      |
| 200 | 9,0                      |
| 225 | 9,0                      |
| 250 | 9,0                      |
| 300 | 9,0                      |

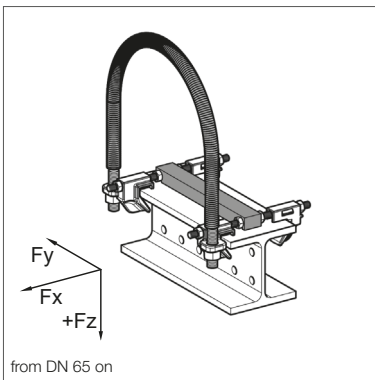
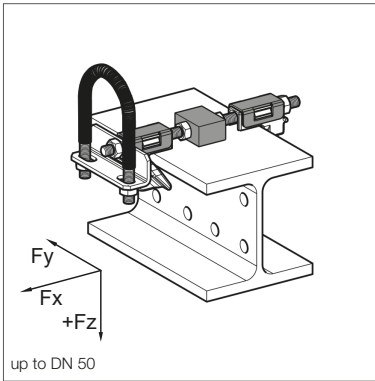


#### Guided support FR - H 20

| DN  | F <sub>y</sub><br>[kN] | + F <sub>z</sub><br>[kN] | - F <sub>z</sub><br>[kN] |
|-----|------------------------|--------------------------|--------------------------|
| 15  | 0,2                    | 4,5                      | 0,2                      |
| 20  | 0,2                    | 4,5                      | 0,2                      |
| 25  | 0,2                    | 4,5                      | 0,2                      |
| 32  | 0,2                    | 4,5                      | 0,2                      |
| 40  | 0,2                    | 4,5                      | 0,2                      |
| 50  | 0,2                    | 4,5                      | 0,2                      |
| 65  | 0,9                    | 9,0                      | 1,1                      |
| 80  | 0,9                    | 9,0                      | 1,1                      |
| 100 | 0,9                    | 9,0                      | 1,1                      |
| 125 | 0,9                    | 9,0                      | 1,1                      |
| 150 | 0,9                    | 9,0                      | 1,1                      |
| 175 | 0,9                    | 9,0                      | 1,1                      |
| 200 | 0,9                    | 9,0                      | 1,1                      |
| 225 | 0,9                    | 9,0                      | 1,1                      |
| 250 | 0,9                    | 9,0                      | 1,1                      |
| 300 | 0,9                    | 9,0                      | 1,1                      |

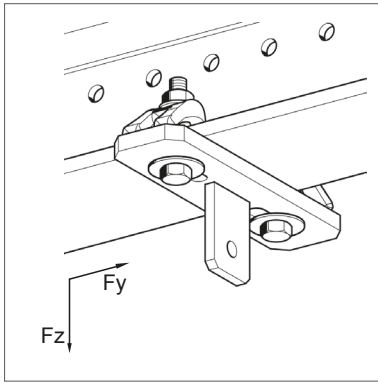


## U-Bolt Supports



### Fixed points XR - H 20

| DN  | $F_x$<br>[kN] | $F_y$<br>[kN] | $+F_z$<br>[kN] | $-F_z$<br>[kN] |
|-----|---------------|---------------|----------------|----------------|
| 15  | 0,5           | 0,2           | 4,5            | 0,2            |
| 20  | 0,5           | 0,2           | 4,5            | 0,2            |
| 25  | 0,5           | 0,2           | 4,5            | 0,2            |
| 32  | 0,5           | 0,2           | 4,5            | 0,2            |
| 40  | 0,5           | 0,2           | 4,5            | 0,2            |
| 50  | 0,5           | 0,2           | 4,5            | 0,2            |
| 65  | 0,3           | 0,9           | 9,0            | 1,1            |
| 80  | 0,3           | 0,9           | 9,0            | 1,1            |
| 100 | 0,3           | 0,9           | 9,0            | 1,1            |
| 125 | 0,3           | 0,9           | 9,0            | 1,1            |
| 150 | 0,3           | 0,9           | 9,0            | 1,1            |
| 175 | 0,3           | 0,9           | 9,0            | 1,1            |
| 200 | 0,3           | 0,9           | 9,0            | 1,1            |
| 225 | 0,3           | 0,9           | 9,0            | 1,1            |
| 250 | 0,3           | 0,9           | 9,0            | 1,1            |
| 300 | 0,3           | 0,9           | 9,0            | 1,1            |



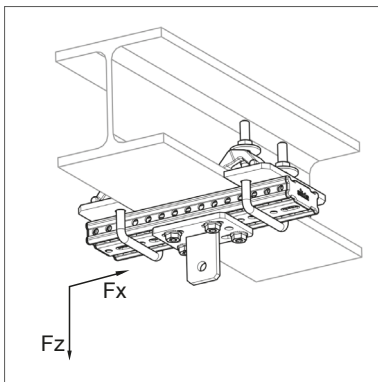
### Working loads for Rod Hangers

Design according to EN 13480-3 Annex J

Working loads valid for up to 4 degrees Load Chain inclination.

#### Beam system Eye-Plate HP 80/99

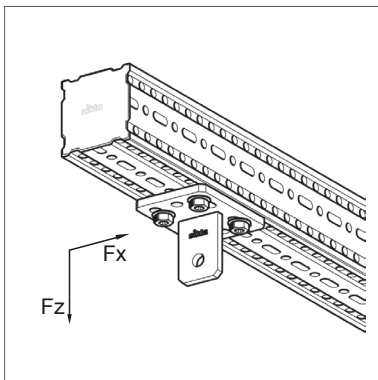
| Type | $F_z$<br>[kN] |
|------|---------------|
| M10  | 11,2          |
| M12  | 12,1          |
| M16  | 12,5          |



#### Rod hanger beam connection LKA

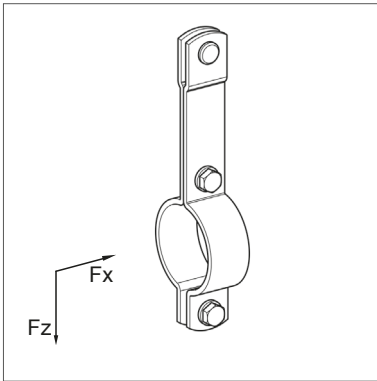
| Trägerbreite<br>100-199 mm |               |
|----------------------------|---------------|
| Type                       | $F_z$<br>[kN] |
| M10                        | 10,9          |
| M12                        | 11,5          |
| M16                        | 12,1          |

| Trägerbreite<br>200-310 mm |               |
|----------------------------|---------------|
| Type                       | $F_z$<br>[kN] |
| M10                        | 10,8          |
| M12                        | 11,3          |
| M16                        | 11,9          |



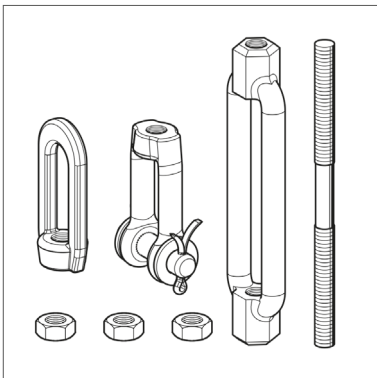
#### siFramo Eye-Plate HP F 80 siFramo Eye-Plate HP F 100

| Type | $F_z$<br>[kN] |
|------|---------------|
| M10  | 11,2          |
| M12  | 12,1          |
| M16  | 12,5          |



### Pipe Clamp Stabil Form C LK

| Beam width<br>100-199 mm |               |
|--------------------------|---------------|
| DN                       | $F_z$<br>[kN] |
| 15                       | 4,0           |
| 20                       | 4,0           |
| 25                       | 4,0           |
| 32                       | 4,0           |
| 40                       | 4,0           |
| 50                       | 4,0           |
| 65                       | 4,0           |
| 80                       | 4,0           |
| 100                      | 4,0           |
| 125                      | 5,4           |
| 150                      | 5,4           |
| 175                      | 5,4           |
| 200                      | 9,3           |
| 250                      | 9,3           |
| 300                      | 9,3           |



### Rod Hanger Load Chain Assembly LKV

| Type | $F_z$<br>[kN] |
|------|---------------|
| M10  | 11,2          |
| M12  | 12,1          |
| M16  | 14,0          |

