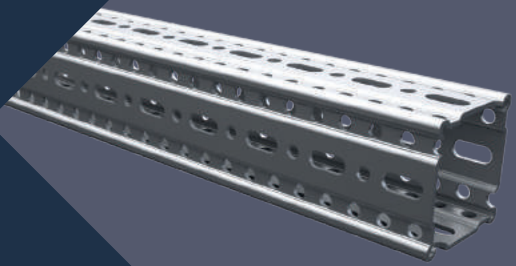
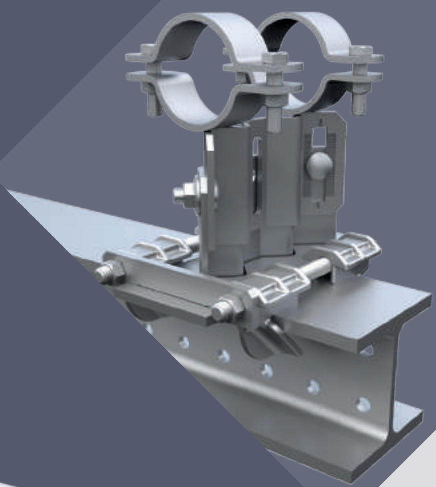
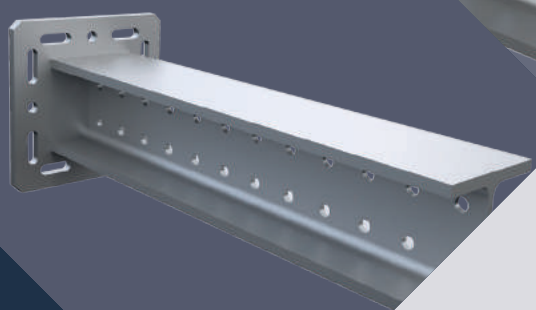






Modular Steelwork

Installation Guidelines 2016

Application

Sikla „Installation Guidelines“ is intended to provide guidance for supporting constructions within industrial pipework and plant engineering consisting of the Sikla Systems Framo 80, Framo 100, Beam System 100 and Beam System 120.
All Sikla Systems mentioned above are certified 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 $F_x = F_z * \mu_0$ 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 ≥ 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 ≥ 201 mm for End Support WBD F100 + 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.

Recyclebility 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.

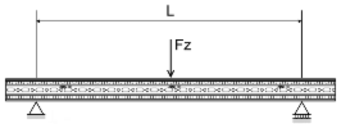
MPA STUTTGART Otto-Graf-Institut Materialprüfungsanstalt Universität Stuttgart; IPU Ingenieurgesellschaft Peil, Ummenhofer mbH Beratende Ingenieure Prüfingenieure für Baustatik; Breinlinger Ingenieure; KIT Karlsruher Institut für Technologie

Test Report numbers: 52140-901 0946 000; 52140-901 2896 000; 155204-2-a; 142 508 T1-3; K14-6005; H14-176;

01/2016

Working loads in accordance with Eurocode 3

Beam Section TP F 80

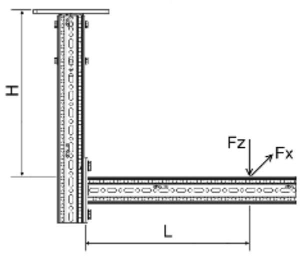


L_{max}	$F_{z,\,perm}$
[mm]	[kN]
1000	**13.9**
1500	**9.2**
2000	**7.0**
2500	**4.6**
3000	**3.2**

F_z as a dead load at L/2.
Max. bending L/200.

Part List
1 x Beam Section TP F 80

L- Construction F 80

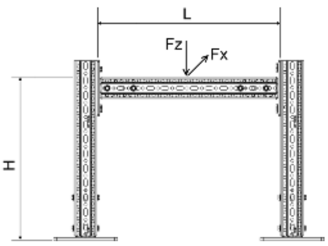


H_{max}	L_{max}	$F_{z,\,perm}$ for $F_x = 0$	$F_{z,\,perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	300	**2.5**	**2.5**
	500	**1.5**	**1.5**
	700	**1.0**	**1.0**
1000	300	**1.8**	**1.8**
	500	**1.1**	**1.1**
	700	**0.8**	**0.8**
1500	300	**1.4**	**1.4**
	500	**0.9**	**0.9**
	700	**0.6**	**0.6**

F_z as dead load at distance L; F_x as a variable load at distance L from pipe expansion/friction.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; L/100.

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

Frame F 80

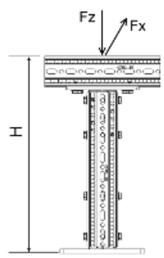


H_{max}	L_{max}	$F_{z,\,perm}$ for $F_x = 0$	$F_{z,\,perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
1000	1000	**20.0**	**17.2**
	1500	**14.5**	**11.6**
	2000	**11.0**	**8.7**
1500	1000	**20.0**	**9.2**
	1500	**14.5**	**8.9**
	2000	**11.0**	**8.6**

F_z as dead load at distance L/2; F_x as a variable load at distance L/2 from pipe expansion/friction.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; max. bending L/200.

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

T- Support F 80



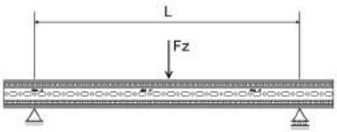
H_{max}	$F_{z,\,perm}$ for $F_x = 0$	$F_{z,\,perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
500	**10.0**	**10.0**
1000	**10.0**	**4.0**
1500	**10.0**	**2.3**

F_z as dead load; F_x as a variable load from pipe expansion/friction.
Central load introduction for planned eccentricity ± 50 mm off-centre.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100.

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

Working loads in accordance with Eurocode 3

Beam Section TP F 100

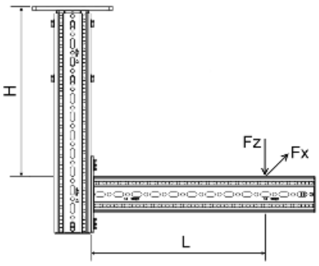


L_{max}	$F_{z, perm}$
[mm]	[kN]
1000	**35.3**
2000	**17.5**
3000	**10.1**
4000	**5.7**
5000	**3.6**
6000	**2.5**

F_z as a dead load at L/2.
Max. bending L/200.

Part List
1 x Beam Section TP F 100

L- Construction F 100

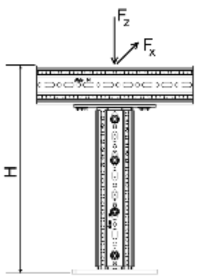


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
1000	300	**3.20**	**3.20**
	500	**2.05**	**2.05**
	700	**1.48**	**1.48**
	900	**1.14**	**1.14**
	1100	**0.91**	**0.91**
1500	300	**2.72**	**2.72**
	500	**1.75**	**1.75**
	700	**1.27**	**1.27**
	900	**0.98**	**0.98**
	1100	**0.78**	**0.78**
2000	300	**2.37**	**2.37**
	500	**1.53**	**1.53**
	700	**1.11**	**1.11**
	900	**0.85**	**0.85**
	1100	**0.68**	**0.68**
2500	300	**2.10**	**2.10**
	500	**1.36**	**1.36**
	700	**0.98**	**0.98**
	900	**0.76**	**0.76**
	1100	**0.60**	**0.60**

F_z as dead load at distance L; F_x as a variable load at distance L from pipe expansion/friction.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; L/100.

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

T- Support F 100



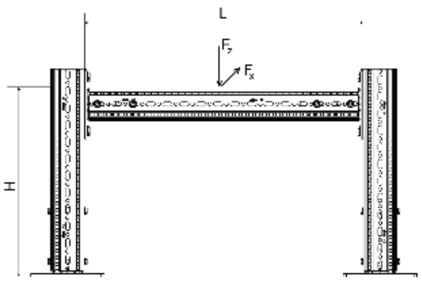
H_{max}	$F_{z, perm}$ $F_x = 0$	$F_{z, perm}$ $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
1500	**12.8**	**4.5**
2000	**12.7**	**3.1**
2500	**12.7**	**2.2**
3000	**12.6**	**1.7**

F_z as dead load; F_x as a variable load from pipe expansion/friction.
Central load introduction for planned eccentricity ± 50 mm off-centre.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/150.

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

Working loads in accordance with Eurocode 3

Frame F 100



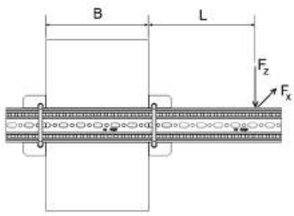
H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
1500	1000	**27.09**	**12.59**
	1500	**25.28**	**12.26**
	2000	**19.48**	**11.85**
	2500	**15.83**	**11.10**
	3000	**12.00**	**10.22**
	3500	**9.26**	**8.70**
	4000	**7.38**	**6.94**
2000	1000	**27.09**	**8.83**
	1500	**25.30**	**8.70**
	2000	**19.49**	**8.51**
	2500	**15.85**	**8.21**
	3000	**11.90**	**7.83**
	3500	**9.16**	**7.37**
	4000	**7.30**	**6.83**
2500	1000	**27.09**	**6.56**
	1500	**25.31**	**6.51**
	2000	**19.19**	**6.42**
	2500	**15.86**	**6.30**
	3000	**11.81**	**6.11**
	3500	**9.07**	**5.88**
	4000	**7.22**	**5.58**
3000	1000	**27.09**	**5.11**
	1500	**24.79**	**5.08**
	2000	**19.19**	**5.04**
	2500	**15.65**	**4.97**
	3000	**11.90**	**4.87**
	3500	**9.02**	**4.73**
	4000	**7.17**	**4.58**
3500	1000	**27.09**	**4.10**
	1500	**24.80**	**4.08**
	2000	**19.20**	**4.06**
	2500	**15.66**	**4.02**
	3000	**11.63**	**3.96**
	3500	**9.11**	**3.89**
	4000	**7.12**	**3.79**
4000	1000	**27.09**	**3.37**
	1500	**24.80**	**3.36**
	2000	**19.20**	**3.34**
	2500	**15.63**	**3.32**
	3000	**11.90**	**3.28**
	3500	**8.88**	**3.24**
	4000	**7.19**	**3.18**

F_z as dead load at distance L/2; F_x as a variable load at distance L/2 from pipe expansion/friction.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; max. bending L/200.

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

Working loads in accordance with Eurocode 3

Joining Beam Bracket F 100 vertical



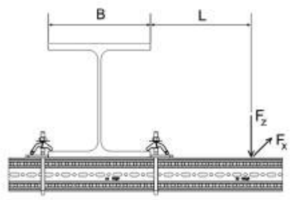
L_{max}	B	$F_{z,\,perm}$ for $F_x = 0$	$F_{z,\,perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
300	100	**0.59**	**0.56**
	150	**0.88**	**0.84**
	200	**1.11**	**1.06**
	250	**1.29**	**1.24**
	300	**1.45**	**1.39**
500	100	**0.39**	**0.37**
	150	**0.60**	**0.58**
	200	**0.79**	**0.75**
	250	**0.94**	**0.90**
	300	**1.08**	**1.03**
700	100	**0.29**	**0.28**
	150	**0.46**	**0.44**
	200	**0.61**	**0.58**
	250	**0.74**	**0.71**
	300	**0.86**	**0.83**
900	100	**0.23**	**0.22**
	150	**0.37**	**0.35**
	200	**0.50**	**0.48**
	250	**0.61**	**0.59**
	300	**0.72**	**0.69**
1100	100	**0.19**	**0.18**
	150	**0.31**	**0.30**
	200	**0.42**	**0.40**
	250	**0.52**	**0.50**
	300	**0.61**	**0.59**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.

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

Working loads in accordance with Eurocode 3

Joining Beam Bracket F 100 horizontal



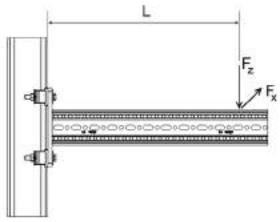
L_{max}	B	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
300	100	**2.36**	**1.12**
	150	**3.51**	**1.67**
	200	**4.43**	**2.10**
	250	**5.17**	**2.45**
	300	**5.79**	**2.75**
500	100	**1.55**	**0.74**
	150	**2.41**	**1.14**
	200	**3.14**	**1.49**
	250	**3.77**	**1.79**
	300	**4.32**	**2.05**
700	100	**1.16**	**0.55**
	150	**1.83**	**0.87**
	200	**2.43**	**1.15**
	250	**2.96**	**1.41**
	300	**3.44**	**1.63**
900	100	**0.92**	**0.44**
	150	**1.48**	**0.70**
	200	**1.98**	**0.94**
	250	**2.44**	**1.16**
	300	**2.86**	**1.36**
1100	100	**0.77**	**0.36**
	150	**1.24**	**0.59**
	200	**1.67**	**0.79**
	250	**2.08**	**0.99**
	300	**2.45**	**1.16**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.

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

Working loads in accordance with Eurocode 3

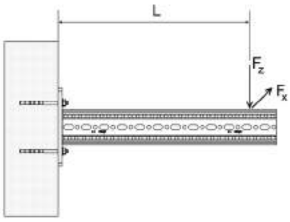
Beam Bracket F 100



Variant a) clamped

L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
300	**10.86**	**6.74**
500	**6.52**	**4.05**
700	**4.66**	**2.89**
900	**3.62**	**2.25**
1100	**2.96**	**1.84**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.



Variant b) anchored

L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
300	**6.17**	**6.17**
500	**4.74**	**4.74**
700	**3.85**	**3.85**
900	**3.09**	**3.09**
1100	**2.53**	**2.53**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.

Variant c) infinitely rigid

L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
300	**27.33**	**24.42**
500	**17.02**	**16.47**
700	**10.57**	**10.57**
900	**7.27**	**7.27**
1100	**5.33**	**5.33**

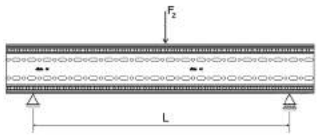
F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.

Part List
1 x Beam Bracket TKO F 100

and variable
a) 1 x Assembly Set P2 S
b) 4 x Injection system VMZ-A (M12/100)
c) infinitely rigid

Working loads in accordance with Eurocode 3

Beam Section TP F 100/160

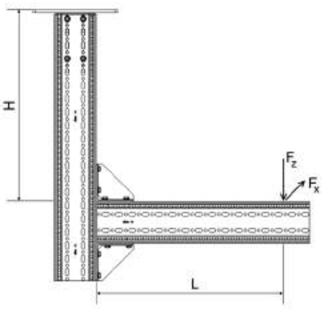


L_{max}	$F_{z, perm}$
[mm]	[kN]
1000	**72.1**
2000	**35.9**
3000	**23.8**
4000	**17.6**
5000	**11.3**
6000	**7.8**

F_z as dead load at distance L/2.
Max. deflection L/200.

Part List
1 x Beam Section TP F 100/160

L- Construction F 100/160



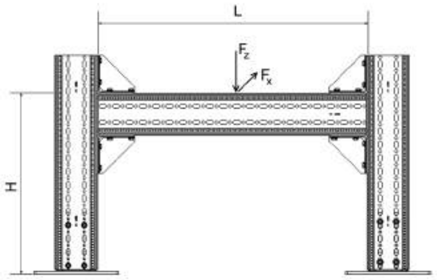
H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
1000	300	**4.84**	**4.84**
	500	**3.22**	**3.22**
	700	**2.38**	**2.38**
	900	**1.87**	**1.87**
	1100	**1.53**	**1.53**
1500	300	**4.40**	**4.40**
	500	**2.94**	**2.94**
	700	**2.18**	**2.18**
	900	**1.71**	**1.71**
	1100	**1.40**	**1.40**
2000	300	**4.04**	**4.03**
	500	**2.71**	**2.71**
	700	**2.01**	**2.01**
	900	**1.58**	**1.58**
	1100	**1.29**	**1.29**
2500	300	**3.72**	**3.72**
	500	**2.51**	**2.51**
	700	**1.87**	**1.87**
	900	**1.47**	**1.47**
	1100	**1.20**	**1.20**
3000	300	**3.46**	**3.46**
	500	**2.34**	**2.34**
	700	**1.74**	**1.74**
	900	**1.37**	**1.37**
	1100	**1.12**	**1.12**
3500	300	**3.23**	**3.23**
	500	**2.19**	**2.19**
	700	**1.63**	**1.63**
	900	**1.28**	**1.28**
	1100	**1.04**	**1.04**
4000	300	**3.02**	**3.02**
	500	**2.05**	**2.05**
	700	**1.53**	**1.53**
	900	**1.20**	**1.20**
	1100	**0.98**	**0.98**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; L/100.

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

Working loads in accordance with Eurocode 3

Frame F 100/160



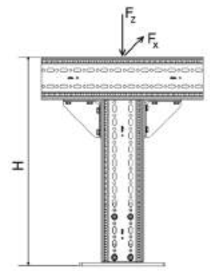
H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
1500	1000	**33.47**	**9.46**
	1500	**33.25**	**9.46**
	2000	**33.05**	**9.33**
	2500	**32.73**	**9.33**
	3000	**27.83**	**9.33**
	3500	**24.20**	**9.33**
	4000	**21.58**	**9.19**
2000	1000	**33.60**	**7.42**
	1500	**33.15**	**7.33**
	2000	**33.15**	**7.33**
	2500	**32.33**	**7.33**
	3000	**27.55**	**7.33**
	3500	**24.23**	**7.25**
	4000	**21.45**	**7.25**
2500	1000	**33.60**	**5.95**
	1500	**33.15**	**5.89**
	2000	**33.15**	**5.89**
	2500	**32.37**	**5.89**
	3000	**27.57**	**5.84**
	3500	**24.03**	**5.84**
	4000	**21.47**	**5.79**
3000	1000	**33.17**	**5.03**
	1500	**33.15**	**5.03**
	2000	**33.15**	**5.03**
	2500	**32.37**	**4.99**
	3000	**27.30**	**4.99**
	3500	**24.05**	**4.99**
	4000	**21.30**	**4.95**
3500	1000	**33.15**	**4.31**
	1500	**33.15**	**4.31**
	2000	**33.15**	**4.31**
	2500	**31.97**	**4.28**
	3000	**27.30**	**4.28**
	3500	**23.83**	**4.25**
	4000	**21.30**	**4.25**
4000	1000	**33.15**	**3.83**
	1500	**33.15**	**3.83**
	2000	**33.15**	**3.83**
	2500	**31.99**	**3.80**
	3000	**27.31**	**3.80**
	3500	**23.84**	**3.78**
	4000	**21.12**	**3.76**

F_z as dead load at distance L/2; F_x as a variable load at distance L/2.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; max. deflection L/200.

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

Working loads in accordance with Eurocode 3

T- Support F 100/160

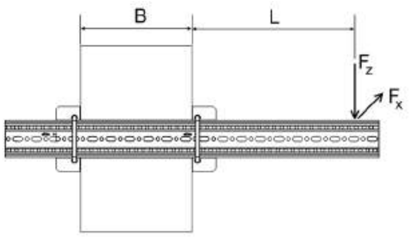


H_{max}	$F_{z, perm}$	
	$F_x = 0$	$F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
1500	**15.3**	**4.8**
2000	**15.3**	**3.4**
2500	**15.2**	**2.5**
3000	**15.1**	**2.0**
3500	**15.0**	**1.6**
4000	**15.0**	**1.3**

F_z as dead load; F_x as a variable load from pipe expansion/friction.
Central load introduction for planned eccentricity ± 50 mm off-centre.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/150.

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

Joining Beam Bracket F 100/160 vertical



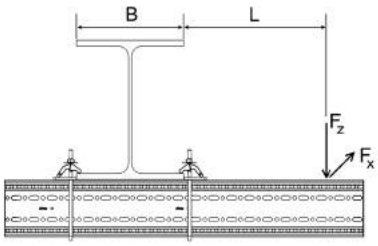
L_{max}	B	$F_{z, perm}$ for	
		$F_x = 0$	$F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
300	100	**0.59**	**0.56**
	150	**0.88**	**0.84**
	200	**1.11**	**1.06**
	250	**1.29**	**1.24**
	300	**1.45**	**1.39**
500	100	**0.39**	**0.37**
	150	**0.60**	**0.58**
	200	**0.79**	**0.75**
	250	**0.94**	**0.90**
	300	**1.08**	**1.03**
700	100	**0.29**	**0.28**
	150	**0.46**	**0.44**
	200	**0.61**	**0.58**
	250	**0.74**	**0.71**
	300	**0.86**	**0.83**
900	100	**0.23**	**0.22**
	150	**0.37**	**0.35**
	200	**0.50**	**0.48**
	250	**0.61**	**0.59**
	300	**0.72**	**0.69**
1100	100	**0.19**	**0.18**
	150	**0.31**	**0.30**
	200	**0.42**	**0.40**
	250	**0.52**	**0.50**
	300	**0.61**	**0.59**

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

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_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 horizontal



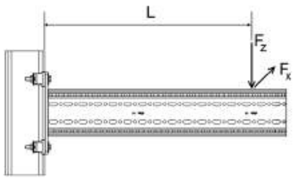
L_{max}	B	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
300	100	**2.36**	**1.12**
	150	**3.51**	**1.67**
	200	**4.43**	**2.10**
	250	**5.17**	**2.45**
	300	**5.79**	**2.75**
500	100	**1.55**	**0.74**
	150	**2.41**	**1.14**
	200	**3.14**	**1.49**
	250	**3.77**	**1.79**
	300	**4.32**	**2.05**
700	100	**1.16**	**0.55**
	150	**1.83**	**0.87**
	200	**2.43**	**1.15**
	250	**2.96**	**1.41**
	300	**3.44**	**1.63**
900	100	**0.92**	**0.44**
	150	**1.48**	**0.70**
	200	**1.98**	**0.94**
	250	**2.44**	**1.16**
	300	**2.86**	**1.36**
1100	100	**0.77**	**0.36**
	150	**1.24**	**0.59**
	200	**1.67**	**0.79**
	250	**2.08**	**0.99**
	300	**2.45**	**1.16**

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

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.

Working loads in accordance with Eurocode 3

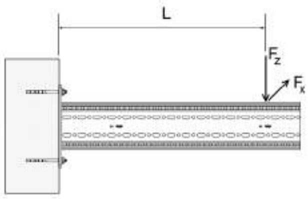
Beam Bracket F 100/160



Variant a) clamped

L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
300	**13.83**	**8.52**
500	**8.30**	**5.11**
700	**5.93**	**3.65**
900	**4.61**	**2.84**
1100	**3.77**	**2.32**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.



Variant b) anchored

L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
300	**6.84**	**6.84**
500	**5.50**	**5.50**
700	**4.60**	**4.60**
900	**3.71**	**3.71**
1100	**3.03**	**3.03**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.

Variant c) infinitely rigid

L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
300	**31.09**	**25.58**
500	**20.94**	**16.92**
700	**15.79**	**12.30**
900	**12.43**	**9.56**
1100	**10.17**	**7.82**

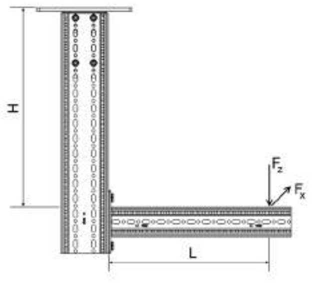
F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation L/100.

Part List
1 x Beam Bracket TKO F 100/160

and variable
a) 1 x Assembly Set P2 S
b) 4 x Injection system VMZ-A (M12/100)
c) infinitely rigid

Working loads in accordance with Eurocode 3

L- Construction F 100/160 - 100



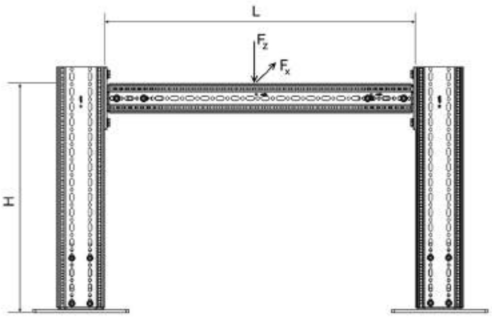
H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
1000	300	**4.77**	**4.40**
	500	**3.11**	**3.11**
	700	**2.26**	**2.26**
	900	**1.74**	**1.74**
	1100	**1.39**	**1.39**
1500	300	**4.34**	**3.44**
	500	**2.85**	**2.85**
	700	**2.08**	**2.08**
	900	**1.60**	**1.60**
	1100	**1.28**	**1.28**
2000	300	**3.98**	**2.83**
	500	**2.63**	**2.52**
	700	**1.92**	**1.92**
	900	**1.49**	**1.49**
	1100	**1.19**	**1.19**
2500	300	**3.68**	**2.40**
	500	**2.44**	**2.17**
	700	**1.79**	**1.79**
	900	**1.38**	**1.38**
	1100	**1.11**	**1.11**
3000	300	**3.42**	**2.08**
	500	**2.28**	**1.91**
	700	**1.67**	**1.67**
	900	**1.30**	**1.30**
	1100	**1.04**	**1.04**
3500	300	**3.19**	**1.84**
	500	**2.14**	**1.70**
	700	**1.57**	**1.57**
	900	**1.22**	**1.22**
	1100	**0.98**	**0.98**
4000	300	**2.99**	**1.65**
	500	**2.01**	**1.53**
	700	**1.48**	**1.43**
	900	**1.15**	**1.15**
	1100	**0.92**	**0.92**

F_z as dead load at distance L; F_x as a variable load at distance L.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; L/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

Working loads in accordance with Eurocode 3

Frame F 100/160 - 100



H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
1500	1000	**30.26**	**9.46**
	1500	**25.27**	**9.46**
	2000	**19.15**	**9.33**
	2500	**15.63**	**9.33**
	3000	**13.34**	**9.33**
	3500	**11.64**	**9.33**
	4000	**10.32**	**8.31**
2000	1000	**30.49**	**7.33**
	1500	**25.28**	**7.33**
	2000	**19.17**	**7.33**
	2500	**15.64**	**7.33**
	3000	**13.35**	**7.33**
	3500	**11.54**	**7.25**
	4000	**10.33**	**7.25**
2500	1000	**30.73**	**5.95**
	1500	**24.77**	**5.89**
	2000	**19.18**	**5.89**
	2500	**15.65**	**5.89**
	3000	**13.21**	**5.84**
	3500	**11.54**	**5.84**
	4000	**10.25**	**5.79**
3000	1000	**30.97**	**5.03**
	1500	**24.79**	**5.03**
	2000	**19.19**	**5.03**
	2500	**15.65**	**4.99**
	3000	**13.22**	**4.99**
	3500	**11.55**	**4.95**
	4000	**10.25**	**4.95**
3500	1000	**30.97**	**4.31**
	1500	**24.79**	**4.31**
	2000	**19.20**	**4.31**
	2500	**15.66**	**4.28**
	3000	**13.22**	**4.28**
	3500	**11.55**	**4.25**
	4000	**10.25**	**4.25**
4000	1000	**30.97**	**3.83**
	1500	**24.80**	**3.83**
	2000	**19.20**	**3.80**
	2500	**15.66**	**3.80**
	3000	**13.22**	**3.78**
	3500	**11.55**	**3.78**
	4000	**10.26**	**3.76**

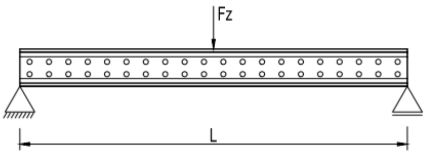
F_z as dead load at distance L/2; F_x as a variable load at distance L/2 from pipe expansion/friction.
Friction coefficient μ_0 = 0.2 for friction in longitudinal direction.
Max. deviation H/100; max. bending L/200.

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

sikla

Working loads in accordance with Eurocode 3

Beam Section 100

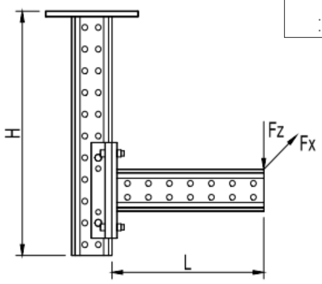


L_{max}	$F_{z, perm}$
[mm]	[kN]
1000	**50.0**
1600	**31.0**
2000	**24.5**
3000	**15.0**
4000	**10.5**
5000	**7.8**
6000	**5.9**

F_z as a dead load at L/2; max. bending L/150.

Part List
Sikla- Beam Section H 100

L- Construction 100

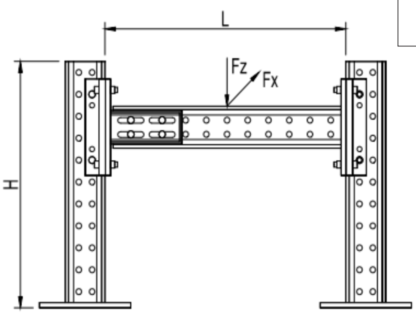


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	200	**4.35**	**1.73**
	600	**1.56**	**0.64**
	1000	**0.93**	**0.38**
1000	200	**4.35**	**0.75**
	600	**1.56**	**0.31**
	1000	**0.90**	**0.18**
1500	200	**4.35**	**0.40**
	600	**1.36**	**0.18**
	1000	**0.80**	**0.11**

F_z as a dead load. F_x as a variable load; max. deviation H/150; L/150.
Friction coefficient $\mu_0 = 0.2$ (for friction in longitudinal direction).

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

Frame 100

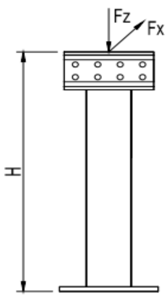


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	500	**16.5**	**15.1**
	1000	**16.4**	**15.0**
	2000	**16.3**	**9.9**
1000	500	**16.5**	**15.1**
	1000	**16.4**	**15.0**
	2000	**16.3**	**9.9**
1500	500	**16.5**	**15.1**
	1000	**16.4**	**15.0**
	2000	**16.3**	**9.9**

F_z as a dead load. F_x as a variable load.
Max. bending L/150; max. deviation H/150.
Friction coefficient $\mu_0 = 0.2$ (for friction in longitudinal direction).

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

T- Support 100



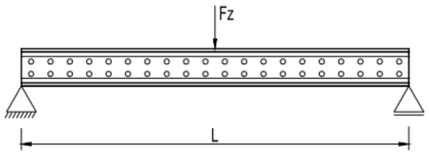
H_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
200	**13.0**	**13.0**
600	**13.0**	**13.0**
1000	**13.0**	**13.0**
1400	**13.0**	**13.0**
2000	**13.0**	**9.5**

F_z as a dead load; F_x as a variable load; max. deviation H/150.
Central load introduction for planned eccentricity ± 50 mm off-centre.
Friction coefficient $\mu_0 = 0.2$ (for friction in longitudinal direction).

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

Working loads in accordance with Eurocode 3

Beam Section 100

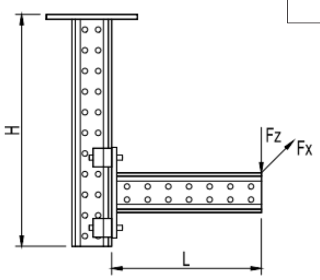


L_{max}	$F_{z, perm}$
[mm]	[kN]
1000	**50.0**
1600	**31.0**
2000	**24.5**
3000	**15.0**
4000	**10.5**
5000	**7.8**
6000	**5.9**

F_z as a dead load at L/2; max. bending L/150.

Part List
Sikla- Beam Section H 100

L- Construction 100

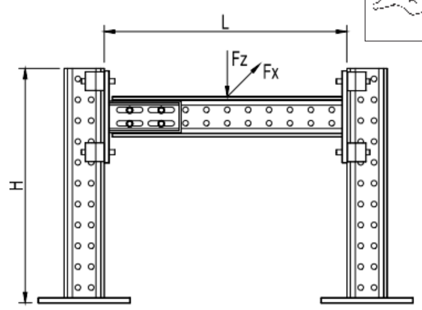


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	200	**3.51**	**3.22**
	600	**2.67**	**1.54**
	1000	**2.13**	**0.95**
1000	200	**3.51**	**0.96**
	600	**2.67**	**0.43**
	1000	**2.13**	**0.27**
1500	200	**3.51**	**0.46**
	600	**2.59**	**0.22**
	1000	**1.79**	**0.14**

F_z as a dead load. F_x as a variable load; max. deviation H/150; L/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
2 x Beam Bracket TKO 100
1 x Assembly Set P2 S

Frame 100

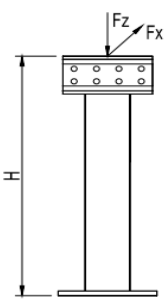


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	500	**8.2**	**8.0**
	1000	**8.1**	**7.9**
	2000	**8.0**	**7.8**
1000	500	**8.2**	**8.0**
	1000	**8.1**	**7.9**
	2000	**8.0**	**7.8**
1500	500	**8.2**	**8.0**
	1000	**8.1**	**7.9**
	2000	**8.0**	**7.8**

F_z as a dead load. F_x as a variable load.
Max. bending L/150; max. deviation H/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
3 x Beam Bracket TKO 100
1 x End Support STA 100
2 x Assembly Set P2 S

T- Support 100



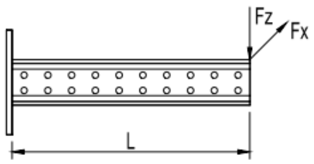
H_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
200	**13.0**	**13.0**
600	**13.0**	**13.0**
1000	**13.0**	**13.0**
1400	**13.0**	**13.0**
2000	**13.0**	**9.5**

F_z as a dead load; F_x as a variable load; max. deviation H/150.
Central load introduction for planned eccentricity ± 50 mm off-centre.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

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

Working loads in accordance with Eurocode 3

Beam Bracket TKO 100

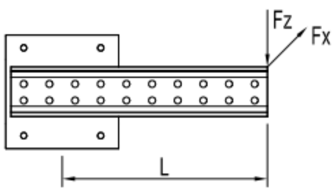


L_{max}	$F_{z,\ perm}$ for $F_x = 0$	$F_{z,\ perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
No consideration of connection to primary structure:		
200	**23.87**	**18.92**
400	**11.91**	**9.44**
600	**7.91**	**6.27**
800	**5.91**	**4.68**
1000	**4.69**	**3.72**
1400	**3.30**	**2.61**
2000	**2.22**	**1.76**
Connection with Assembly Set P2:		
200	**3.51**	**3.22**
400	**3.03**	**2.62**
600	**2.67**	**2.21**
800	**2.37**	**1.90**
1000	**2.13**	**1.67**
1400	**1.76**	**1.33**
2000	**1.36**	**0.99**

F_z as a dead load; F_x as a variable load; max. bending L/150.

Part List
1 x Beam Bracket TKO 100

Joining Beam Bracket QKO 100

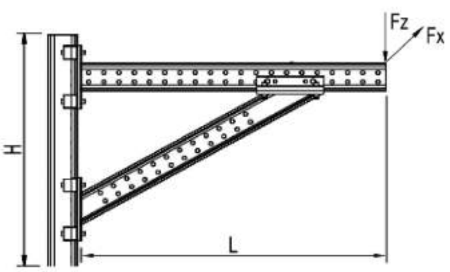


L_{max}	$F_{z,\ perm}$ for $F_x = 0$	$F_{z,\ perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
No consideration of connection to primary structure:		
300	**25.8**	**20.0**
500	**15.7**	**13.0**
700	**11.2**	**9.5**
Connection with Assembly Set P2/P3:		
300	**0.62**	**0.61**
500	**0.37**	**0.36**
700	**0.24**	**0.24**
Connection with Bracket Plates FV:		
300	**1.48**	**1.48**
500	**0.93**	**0.93**
700	**0.66**	**0.66**

F_z as a dead load, F_x as a variable load; max. deviation L/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
1 x Joining Beam Bracket QKO q

Angled Beam Bracket SKO 100



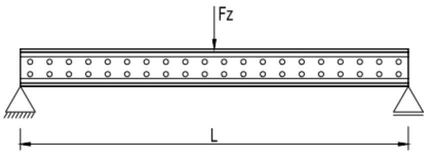
H_{max}	L_{max}	$F_{z,\ perm}$ for $F_x = 0$	$F_{z,\ perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
Inclined to the horizontal Bracket with 60°:			
1000	1000	**1.35**	**0.66**
	397	**1.85**	**1.40**
2000	1000	**1.35**	**0.10**
	397	**1.85**	**0.20**
Inclined to the horizontal Bracket with 30°:			
700	1000	**1.55**	**0.80**
	678	**1.70**	**1.10**
2000	1000	**1.55**	**0.08**
	678	**1.70**	**0.11**

F_z as a dead load. F_x as a variable load; max. bending L/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
2 x Beam Bracket TKO 100
1 x Angled Beam Bracket SKO100
2 x Assembly Set P2 S
1 x Bracket Plates FV 100/120

Working loads in accordance with Eurocode 3

Beam Section 120

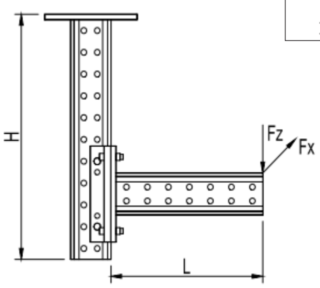


L_{max}	$F_{z, perm}$
[mm]	[kN]
1000	**98.5**
1600	**61.5**
2000	**49.5**
3000	**31.5**
4000	**22.3**
5000	**16.8**
6000	**13.0**

F_z as a dead load at L/2; max. bending L/150.

Part List
Sikla- Beam Section H 120

L- Construction 120

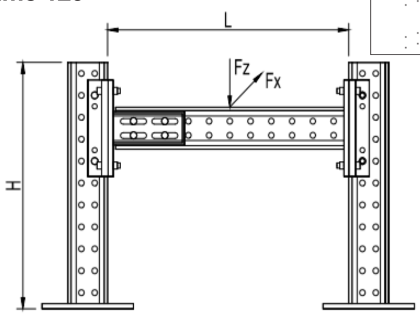


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	200	**4.35**	**2.43**
	600	**1.59**	**0.85**
	1000	**0.96**	**0.50**
1000	200	**4.35**	**1.45**
	600	**1.59**	**0.57**
	1000	**0.96**	**0.34**
1500	200	**4.35**	**0.88**
	600	**1.59**	**0.40**
	1000	**0.96**	**0.24**

F_z as a dead load. F_x as a variable load; max. deviation H/150; L/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

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

Frame 120

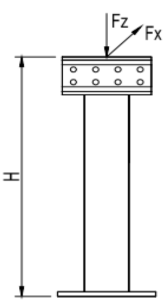


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	500	**16.5**	**15.1**
	1000	**16.3**	**14.9**
	2000	**16.1**	**14.7**
1000	500	**16.5**	**15.1**
	1000	**16.3**	**14.9**
	2000	**16.1**	**14.7**
1500	500	**16.5**	**15.1**
	1000	**16.3**	**14.9**
	2000	**16.1**	**14.7**

F_z as a dead load. F_x as a variable load.
Max. bending L/150. max. deviation H/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

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

T- Support 120



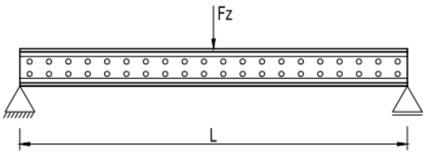
H_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
200	**23.6**	**23.6**
600	**23.6**	**23.6**
1000	**23.6**	**23.6**
1400	**23.6**	**21.6**
2000	**23.6**	**15.9**

F_z as a dead load. F_x as a variable load; max. deviation H/150.
Central load introduction for planned eccentricity ± 50 mm off-centre.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

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

Working loads in accordance with Eurocode 3

Beam Section 120

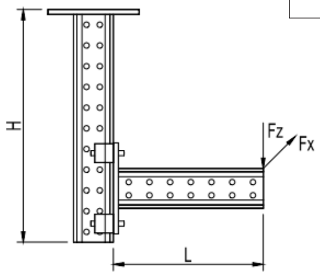


L_{max}	$F_{z, perm}$
[mm]	[kN]
1000	**98.5**
1600	**61.5**
2000	**49.5**
3000	**31.5**
4000	**22.3**
5000	**16.8**
6000	**13.0**

F_z as a dead load at L/2. max. bending L/150.

Part List
Sikla- Beam Section H 120

L- Construction 120

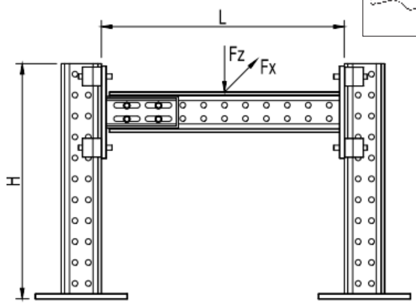


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	200	**3.61**	**3.35**
	600	**2.86**	**2.41**
	1000	**2.34**	**1.86**
1000	200	**3.61**	**2.59**
	600	**2.86**	**1.23**
	1000	**2.34**	**0.78**
1500	200	**3.61**	**1.18**
	600	**2.86**	**0.62**
	1000	**2.34**	**0.39**

F_z as a dead load. F_x as a variable load; max. deviation H/150; L/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
2 x Beam Bracket TKO 120
1 x Assembly Set P2 S

Frame 120

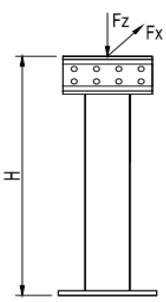


H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
500	500	**8.2**	**8.0**
	1000	**8.0**	**7.8**
	2000	**7.8**	**7.6**
1000	500	**8.2**	**8.0**
	1000	**8.0**	**7.8**
	2000	**7.8**	**7.6**
1500	500	**8.2**	**8.0**
	1000	**8.0**	**7.8**
	2000	**7.8**	**7.6**

F_z as a dead load. F_x as a variable load.
Max. bending L/150. max. deviation H/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
3 x Beam Bracket TKO 120
1 x End Support STA 120
2 x Assembly Set P2 S

T- Support 120



H_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
200	**23.6**	**23.6**
600	**23.6**	**23.6**
1000	**23.6**	**23.6**
1400	**23.6**	**21.6**
2000	**23.6**	**15.9**

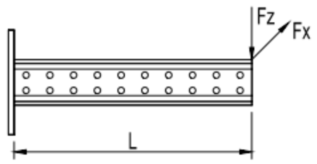
F_z as a dead load. F_x as a variable load; max. deviation H/150.
Central load introduction for planned eccentricity ± 50 mm off-centre.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

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

sikla

Working loads in accordance with Eurocode 3

Beam Bracket TKO 120

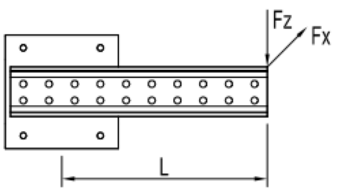


L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
No consideration of connection to primary structure:		
200	**40.7**	**31.3**
400	**20.3**	**15.6**
600	**13.5**	**10.4**
800	**10.1**	**7.7**
1000	**8.0**	**6.2**
1400	**5.6**	**4.3**
2000	**3.8**	**2.9**
Connection with Assembly Set P2:		
200	**3.61**	**3.35**
400	**3.20**	**2.81**
600	**2.86**	**2.41**
800	**2.57**	**2.10**
1000	**2.34**	**1.86**
1400	**1.95**	**1.49**
2000	**1.52**	**1.12**

F_z as a dead load. F_x as a variable load; max. bending L/150.

Part List
1 x Beam Bracket TKO 120

Joining Beam Bracket QKO 120

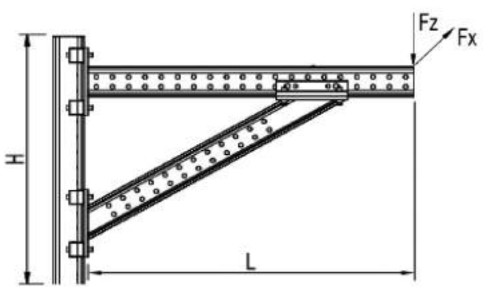


L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[kN]	[kN]
No consideration of connection to primary structure:		
300	**31.8**	**25.7**
500	**19.4**	**16.3**
700	**13.8**	**11.9**
Connection with Assembly Set P2/P3:		
300	**0.72**	**0.69**
500	**0.44**	**0.40**
700	**0.29**	**0.25**
Connection with Bracket Plates FV:		
300	**1.46**	**1.46**
500	**0.90**	**0.90**
700	**0.62**	**0.62**

F_z as a dead load. F_x as a variable load; max. deviation L/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
1 x Joining Beam Bracket QKO q

Angled Beam Bracket SKO 120



H_{max}	L_{max}	$F_{z, perm}$ for $F_x = 0$	$F_{z, perm}$ for $F_x = \mu_0 * F_z$
[mm]	[mm]	[kN]	[kN]
Inclined to the horizontal Bracket with 60°:			
1000	1000	**1.35**	**0.66**
	397	**1.85**	**1.40**
2000	1000	**1.35**	**0.10**
	397	**1.85**	**0.20**
Inclined to the horizontal Bracket with 30°:			
700	1000	**1.55**	**0.80**
	678	**1.70**	**1.10**
2000	1000	**1.55**	**0.08**
	678	**1.70**	**0.11**

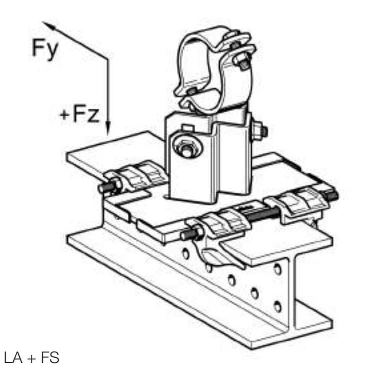
F_z as a dead load. F_x as a variable load; max. bending L/150.
Friction coefficient μ_0 = 0.2 (for friction in longitudinal direction).

Part List
2 x Beam Bracket TKO 120
1 x Angled Beam Bracket SKO100
2 x Assembly Set P2 S
1 x Bracket Plates FV 100/120

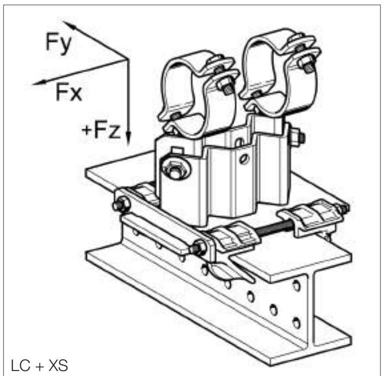
Working loads for Pipe Shoes LA, LC and LD - HV

Basis of assessment EC 3.

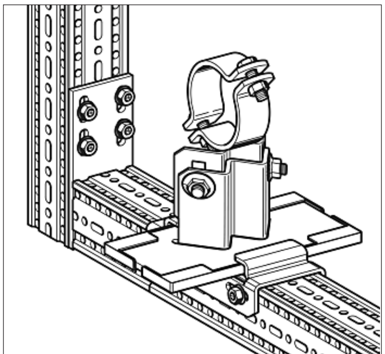
Pipe Shoe LA - HV + Guiding Set FS resp. Fixed Point Set XS
Pipe Shoe LA - HV + Guiding Bracket FW F resp. Fixed Point Bracket XW F

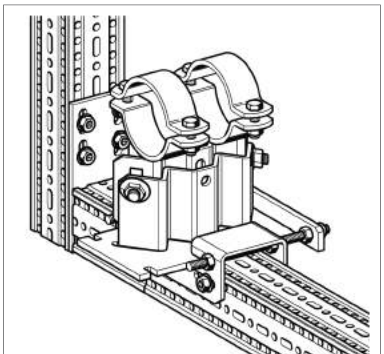


LA + FS



LC + XS


LA + FW F 80


LC + XW F 80

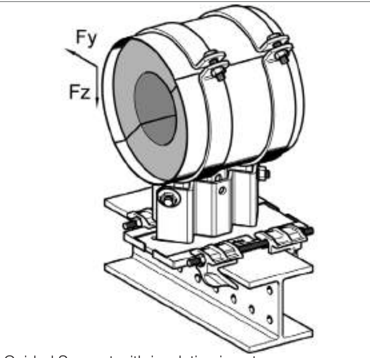
Height	DN	F_x [kN] Fixed Points only	F_y [kN]	+ F_z [kN]	- F_z FS 80/120 [kN]	- F_z FW F [kN]	- F_z XS 80/120 [kN]	- F_z XW F [kN]
90	≤ 25	9.1	5.2	15.4	14	6.1	15.4	15.4
90	32	8.8	4.9	15.4	14	6.1	15.4	15.4
90	40	8.6	4.8	15.4	14	6.1	15.4	15.4
90	50	8.2	4.4	15.4	14	6.1	15.4	15.4
90	65	7.7	3.9	15.4	14	6.1	15.4	15.4
90	80	7.3	3.6	15.4	14	6.1	15.4	15.4
90	100	6.5	2.8	15.4	14	6.1	15.4	15.4
90	125	5.7	2.1	15.4	14	6.1	15.4	15.4
90	150	4.7	1.3	15.4	14	6.1	15.4	15.4
150	≤ 25	8.0	4.2	15.4	14	6.1	15.4	15.4
150	32	7.9	3.9	15.4	14	6.1	15.4	15.4
150	40	7.8	3.9	15.4	14	6.1	15.4	15.4
150	50	7.6	3.6	15.4	14	6.1	15.4	15.4
150	65	7.4	3.2	15.4	14	6.1	15.4	15.4
150	80	7.2	3.0	15.4	14	6.1	15.4	15.4
150	100	6.9	2.5	15.4	14	6.1	15.4	15.4
150	125	6.5	2.0	15.4	14	6.1	15.4	15.4
150	150	6.1	1.4	15.4	14	6.1	15.4	15.4
200	≤ 25	6.3	3.6	15.4	14	6.1	15.4	15.4
200	32	6.2	3.5	15.4	14	6.1	15.4	15.4
200	40	6.2	3.4	15.4	14	6.1	15.4	15.4
200	50	6.0	3.2	15.4	14	6.1	15.4	15.4
200	65	5.9	3.0	15.4	14	6.1	15.4	15.4
200	80	5.7	2.8	15.4	14	6.1	15.4	15.4
200	100	5.5	2.4	15.4	14	6.1	15.4	15.4
200	125	5.2	2.0	15.4	14	6.1	15.4	15.4
200	150	4.9	1.6	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

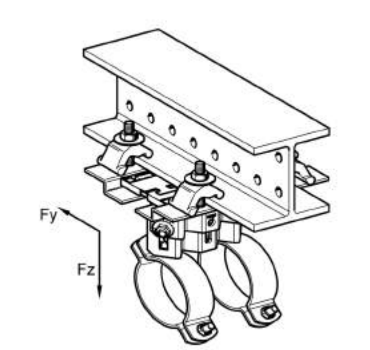
Height	DN	F_x [kN] Fixed Points only	F_y [kN]	$+F_z$ [kN]	$-F_z$ FS 80/120 [kN]	$-F_z$ FW F [kN]	$-F_z$ XS 80/120 [kN]	$-F_z$ XW F [kN]
90	≤ 25	14.3	6.3	17.0	14	6.1	17	17
90	32	14.1	6.2	17.0	14	6.1	17	17
90	40	14.0	6.1	17.0	14	6.1	17	17
90	50	13.9	5.9	17.0	14	6.1	17	17
90	65	13.6	5.6	17.0	14	6.1	17	17
90	80	13.5	5.4	17.0	14	6.1	17	17
90	100	13.1	5.0	17.0	14	6.1	17	17
90	125	12.7	4.5	17.0	14	6.1	17	17
90	150	12.3	4.0	17.0	14	6.1	17	17
90	200	11.6	3.2	17.0	14	6.1	17	17
90	250	10.8	2.3	17.0	14	6.1	17	17
90	300	10.1	1.5	17.0	14	6.1	17	17
150	≤ 25	8.5	4.9	17.0	14	6.1	17	17
150	32	8.5	4.8	17.0	14	6.1	17	17
150	40	8.5	4.7	17.0	14	6.1	17	17
150	50	8.4	4.6	17.0	14	6.1	17	17
150	65	8.4	4.4	17.0	14	6.1	17	17
150	80	8.4	4.3	17.0	14	6.1	17	17
150	100	8.3	4.0	17.0	14	6.1	17	17
150	125	8.3	3.7	17.0	14	6.1	17	17
150	150	8.2	3.3	17.0	14	6.1	17	17
150	200	8.1	2.7	17.0	14	6.1	17	17
150	250	8.0	2.1	17.0	14	6.1	17	17
150	300	7.9	1.5	17.0	14	6.1	17	17
200	≤ 25	7.3	5.3	17.0	14	6.1	17	17
200	32	7.2	5.2	17.0	14	6.1	17	17
200	40	7.2	5.1	17.0	14	6.1	17	17
200	50	7.1	4.9	17.0	14	6.1	17	17
200	65	7.0	4.7	17.0	14	6.1	17	17
200	80	6.9	4.6	17.0	14	6.1	17	17
200	100	6.7	4.3	17.0	14	6.1	17	17
200	125	6.5	4.0	17.0	14	6.1	17	17
200	150	6.3	3.6	17.0	14	6.1	17	17
200	200	5.9	3.0	17.0	14	6.1	17	17
200	250	5.5	2.3	17.0	14	6.1	17	17
200	300	5.1	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

Height	DN	F_x [kN] Fixed Points only	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	≤ 350	25.0	13.1	32.8	28	12.2	32.8	32.8
90	400	22.5	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	10.3	7.2	32.8	28	12.2	32.8	32.8
150	≤ 350	25.0	12.9	32.8	28	12.2	32.8	32.8
150	400	22.5	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	8.7	6.3	32.8	28	12.2	32.8	32.8
200	≤ 350	25.0	11.3	32.8	28	12.2	32.8	32.8
200	400	20.5	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	7.5	6.1	32.8	28	12.2	32.8	32.8



Guided Support with insulation insert



Guided Support, suspension

Working loads for Supports with insulation insert and suspension

Basis of assessment EC 3.

Pipe Shoe LK - HV + Guiding Set FS

Height	DN	F_y [kN]	+ F_z [kN]
150	25	3.1	3.1
150	32	3.8	3.8
150	40	4.3	4.3
150	50	4.0	3.9
150	65	2.8	2.8
150	80	2.5	2.4
150	100	4.5	17.0
150	125	4.1	17.0
150	150	3.6	17.0
150	200	2.8	17.0
150	250	1.9	17.0
150	300	0.4	17.0

Pipe Shoe LC - HV + Guiding Set FS Z

Height	DN	F_y [kN]	+ F_z [kN]
90	25	5.0	10.0
90	32	4.8	10.0
90	40	4.7	10.0
90	50	4.5	10.0
90	65	4.2	10.0
90	80	4.0	10.0
90	100	3.6	10.0
90	125	3.3	10.0
90	150	3.1	10.0
90	200	2.7	10.0
90	250	2.3	10.0
90	300	1.5	10.0
150	25	3.2	10.0
150	32	3.1	10.0
150	40	3.1	10.0
150	50	3.0	10.0
150	65	2.8	10.0
150	80	2.8	10.0
150	100	2.6	10.0
150	125	2.4	10.0
150	150	2.3	10.0
150	200	2.0	10.0
150	250	1.7	10.0
150	300	1.3	10.0
200	25	2.5	10.0
200	32	2.4	10.0
200	40	2.4	10.0
200	50	2.3	10.0
200	65	2.2	10.0
200	80	2.2	10.0
200	100	2.1	10.0
200	125	2.0	10.0
200	150	1.9	10.0
200	200	1.7	10.0
200	250	1.5	10.0
200	300	1.1	10.0

Supports (Pipe Shoes)

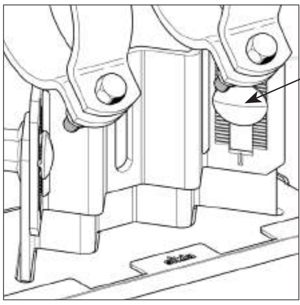
Application

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.

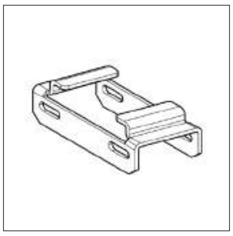
Installation

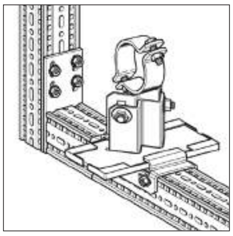


Special bolts for height- adjustable connection of lower and upper Pipe Shoe components.
Tightening torque: 80 Nm

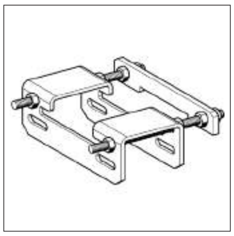
By combining ***Pipe Shoe LA or LC*** with the steel supporting structure and connecting parts below, it is possible to create a guided pipe shoe or a fixed point pipe shoe:

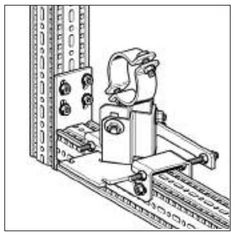
Guiding Support on Framo
+ Guiding Bracket FW F ...



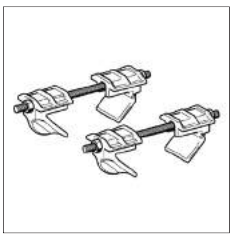


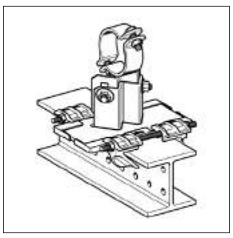
Fixed Point Support on Framo
+ Fixed Point Bracket XW F ...



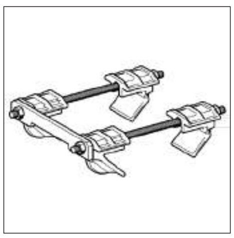


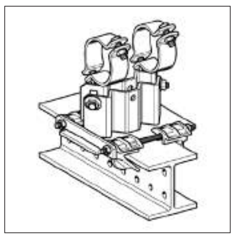
Guiding Support on steel beam section
+ Guiding Set FS ...





Fixed Point Support on steel beam section
+ Fixed Point Set XS ...

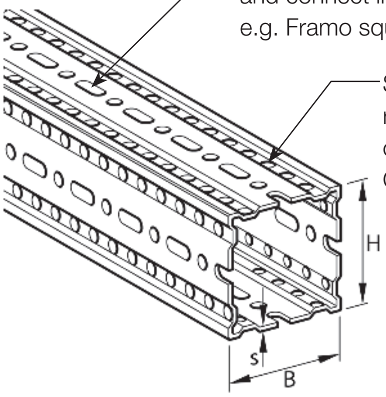




The dimension of the existing steel beam determines the required type of connection kit.
Can be installed on steel beams with flange width ≤ 300 mm and flange thickness ≤ 30 mm.

Framo

Beam Section TP F 80 and TP F 100



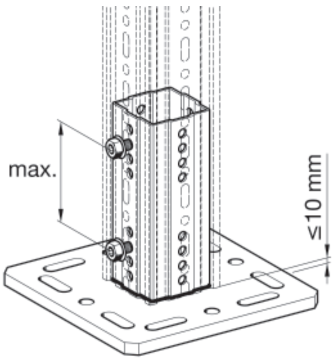
Self-Forming-Screws FLS F pass- through the slotted holes Ø11x30 mm and connect into the Framo components within the box section: e.g. Framo square End Support WBD F and Framo octagonal STA F.

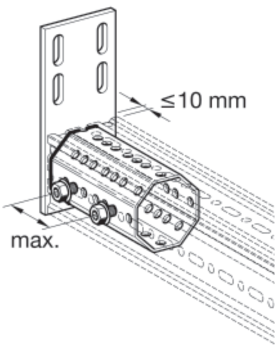
Self-Forming-Screws FLS screws directly into the Ø 9.1 mm round-holes (perforations) running along the outer edges of each face of the Framo beam. All connecting Framo components are fixed in this way: e.g. Cantilever Brackets AK F, End Supports STA F, Channel Adapters SA F and Slide Sets GS F.

Self-Forming-Screw FLS F
Thread- forming bolt with locking- serration for all connections.

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

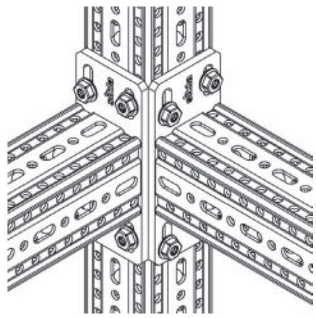
Assembly of Beam Section TP F with WBD-End Support and End Support STA F
For best performance the Self-Forming-Screw FLS F must be applied to both sides in greatest possible distance apart 2 x 2 screws opposite one another.
Distance between end of section and end-plate: ≤ 10 mm.



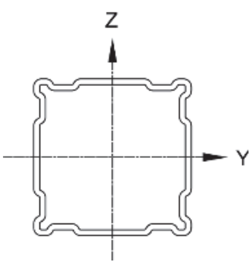


Assembly to Beam Section TP F, e.g. Cantilever Bracket AK F
Offset hole-lines allow for connection at one level without collision of bolts inside the box section for all components with end-plate (e.g. STA F, SA F).
4 Self-Forming-Screws are required to fix each end-plate!

Each connection to the section requires 4 screws! Plugged through the slotted hole, these will screw into the round- hole of the section underneath.



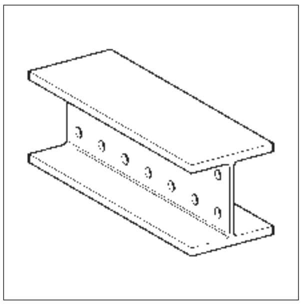
Technical Data

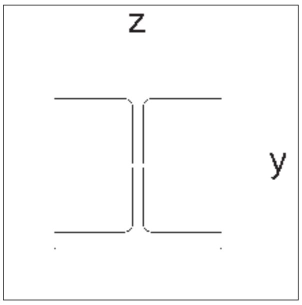


Description Beam Section [mm]	Description Axis	Thickn. s [mm]	Moment of Inertia I_y [cm⁴]	Moment of Inertia I_z [cm⁴]	Section Modulus W_y [cm³]	Section Modulus W_z [cm³]	Radius of Inertia i_y [cm]	Radius of Inertia i_z [cm]	Torsional Moment It [cm⁴]	Cross Section A [cm²]	Weight G [kg/m]
TP F 80/30		3.0	35.4*)	6.7*)	10.3*)	4.7*)	3.63	1.58	11.20	2.69*)	4.3
TP F 80/80		3.0	63.4*)		15.8*)		2.95		98.22*)	7.28	6.4
TP F 100/100		4.0	179.8*)		36.9*)		4.80		181.44	7.80*)	10.8
TP F 100/160		4.0	559.4*)	280.3*)	75.5*)	46.2*)	6.16	4.36	384.80	14.74*)	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.

Section data Simotec Beam System 100 / 120





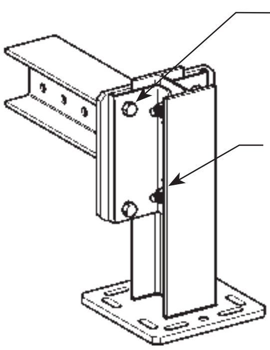
Beam Section	Moment of Inertia [cm⁴]		Section Modulus [cm³]		Radius of Inertia [cm]		Torsional Moment [cm⁴]	Cross Section [cm²]	Weight [kg/m]
	I_y	I_z	W_y	W_z	i_y	i_z	It	A	G
H 100	**341**	**133**	**71.0**	**26.7**	**4.14**	**2.59**	**5.15**	**19.9**	**16.40**
HEA 100	349	134	72.8	26.8	4.06	2.51	5.26	21.2	16.70
H 120	**853**	**317**	**142.0**	**52.8**	**5.13**	**3.13**	**13.66**	**32.3**	**26.50**
HEA 120	864	318	144.0	52.9	5.04	3.06	13.90	34.0	26.70

Remarks
HEA 100 = IPBl 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)

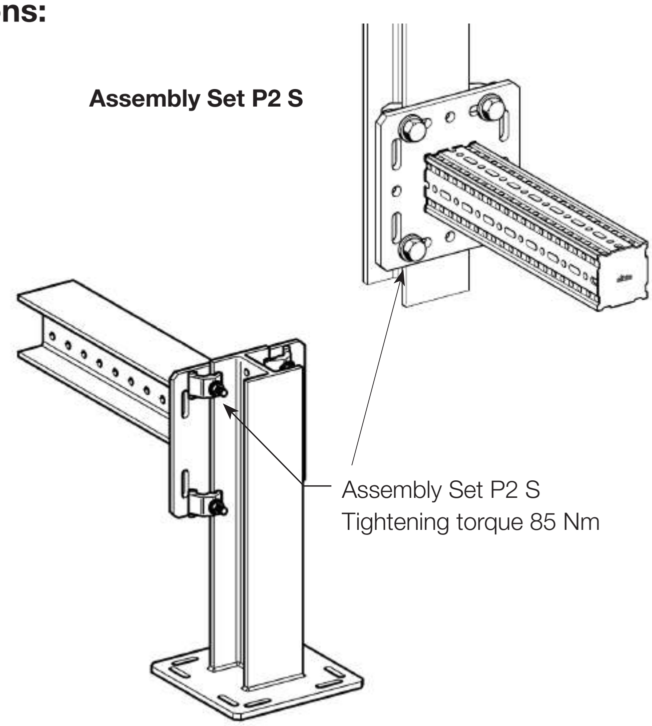
Sikla Beam Sections H 100 und H 120 are hot-dipped-galvanized as per DIN 50976 / DIN EN ISO 1461.

Tightening torque for typical connections:

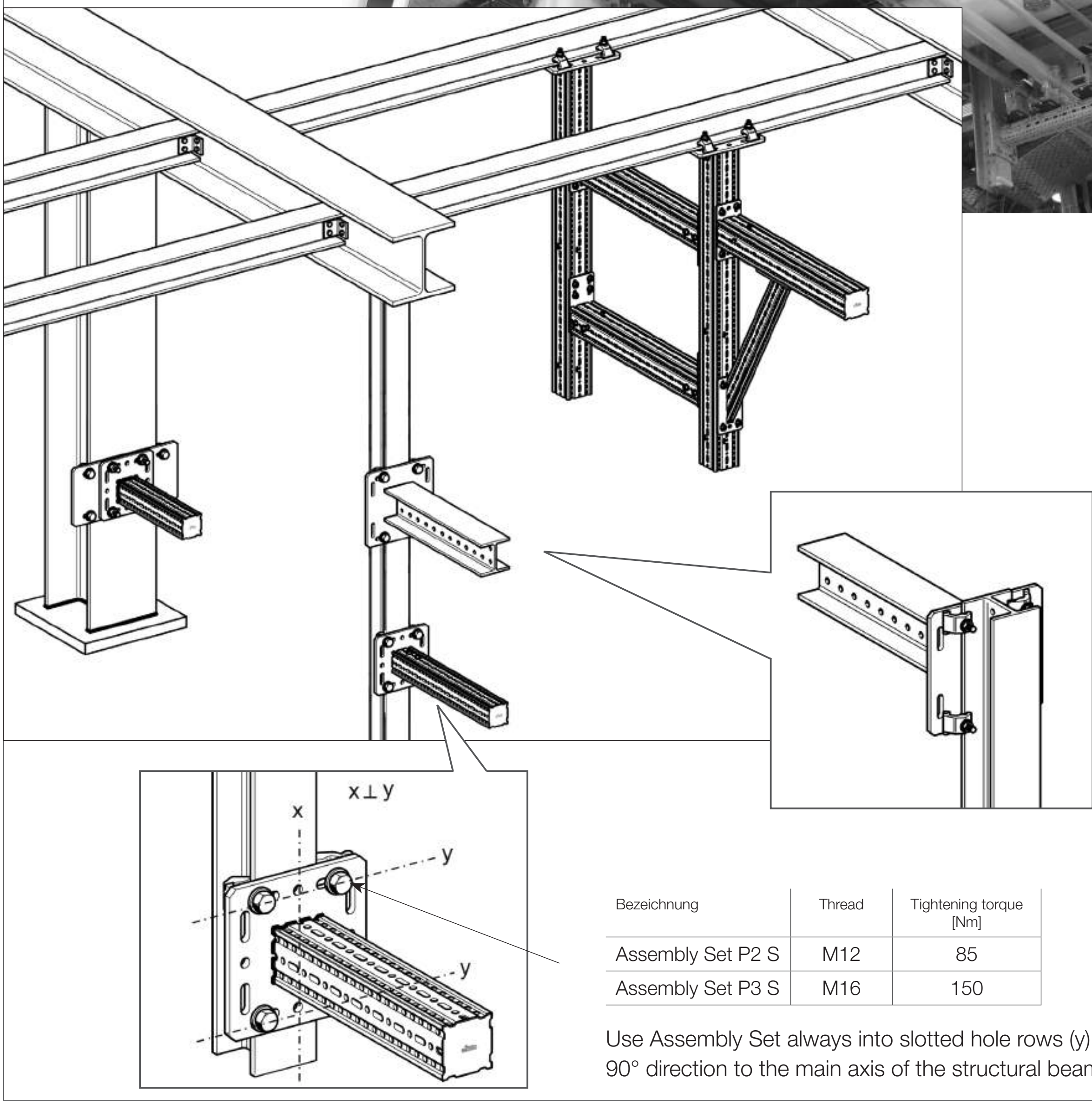
Bracket Plates FV 100/120



Assembly Set P2 S



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



Bezeichnung	Thread	Tightening torque [Nm]
Assembly Set P2 S	M12	85
Assembly Set P3 S	M16	150

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