sikla



Seismic

Guideline

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Contacts

Sikla Hispania, S.L.U.

Calle Camelia, 14
Polígono Industrial Las Mercedes
28970 Humanes de Madrid (Madrid)
Teléfono +34 916 155 785
ingenieria.es@sikla.com

www.sikla.es

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Foreword

Experience from around the world shows that failure of engineering services due to insufficient structural design of fixings of equipment, hangers and supports of pipes, ducts and electrical conduits in case of seismic actions has a significant effect on life safety and economic loss.

This guideline provides information needed by those carrying out the design work for seismic proof installations of the engineering service. It is based on a non-specific design process using ready-made solutions for standard situations.

This typically includes:

- pipe bracing
- duct bracing
- fan coil unit bracing
- cable tray bracing
- floor mounted components
- light fitting details.

This guideline does not apply to Fire Fighting Systems.

As the seismicity is different from site to site and country the nationally determined Building codes and standards are to be applied have to be considered for the design process.

Understandable design examples and principle solutions to restraint installations have been given.

Design fundamentals

According to EN 1998-1 ultimate limit state (ULS) calculations with the factor $y_s = y_M$ have to consider possible stability degradation due to cyclic deflections. The factors y_s can be defined according to national annex.

Calculations in the context of capacity design have to consider the possibility of an increased yield point (compared to the standard yield point) by applying the mechanical overstrength value y_{ov}.

The allcocation of material properties within the structure, such as yield point and ductility, has to ensure that the dissipative structures will form in the intended areas in the event of an earthquake. It is expected that the dissipative areas plasticise during an earthquake before other structure parts do so.

This is realized by making sure that the maximum yield point $f_{y,max}$ of the steel material in dissipative areas conforms with the following condition: $f_{y,max} \leq 1{,}1 * y_{ov} * f_y$ where y_{ov} is the overstrength value and f_y is the yield point of the used steel material.

This method equals the maximum value for $f_{y,max} = 323$ N/mm² for S235 steel with $y_{ov} = 1{,}25$. The factor y_{ov} can be defined according to national annex. The applied value here is $y_{ov} = 1{,}25$.

The applied partial safety coefficient y_M for the material and product properties covers the following:

- The possibility of unfavourable differences of material and product properties from its characateristic values
- The mean variation of the conversion factor η.

The partial safety coefficient y_M, with which the characteristic value for capacity to withstand stresses is derated, is defined as following:

- The capacity of cross sections: y_{M0}
- The capacity of components for stability analysis: y_{M1}
- The capacity of cross sections in the event of breaking due to tensile stress: y_{M2}

The following values are applied:

- γ_{M0} = 1,00
- γ_{M1} = 1,10
- γ_{M2} = 1,25

Mechanical impact

Displayed are maximum recommended loads under seismic stress which have to be understood as the maximum values of impact $F_{RD,S,eq}$. These values are defined as:

- $F_{RD,S,eq}$ = maximum recommended load under seismic impact
- F_h = horizontal load as $F_{RD,S,eq}$ (F_h)
- F_v = vertical load as $F_{RD,S,eq}$ (F_v)
- H_{max} = maximum allowable height of connections up to the level of impact.

Maximum allowable seismic load for channels:

The load application into the channel and the maximum allowable flank moment of the channel have to be checked. The fixations in the structure have to be calculated separately.

The load capacity $N_{b,Rd}$ for flexural buckling is calculated with the cross section depending of the flexural buckling axis and the material stability knuckle line. The impact of local buckling and cross section form instability was not considered in the load capacity calculation.

Sikla strongly advices the customer that the displayed examples have to be reviewed and verified in the event of application by the structural engineer in charge. Reviewed has to be the accordance of products, calculation modelling and the respective technical standards, rules and guidelines that were applied.

The products have to be processed and applied according to Sikla Installation Guidelines and data sheets.

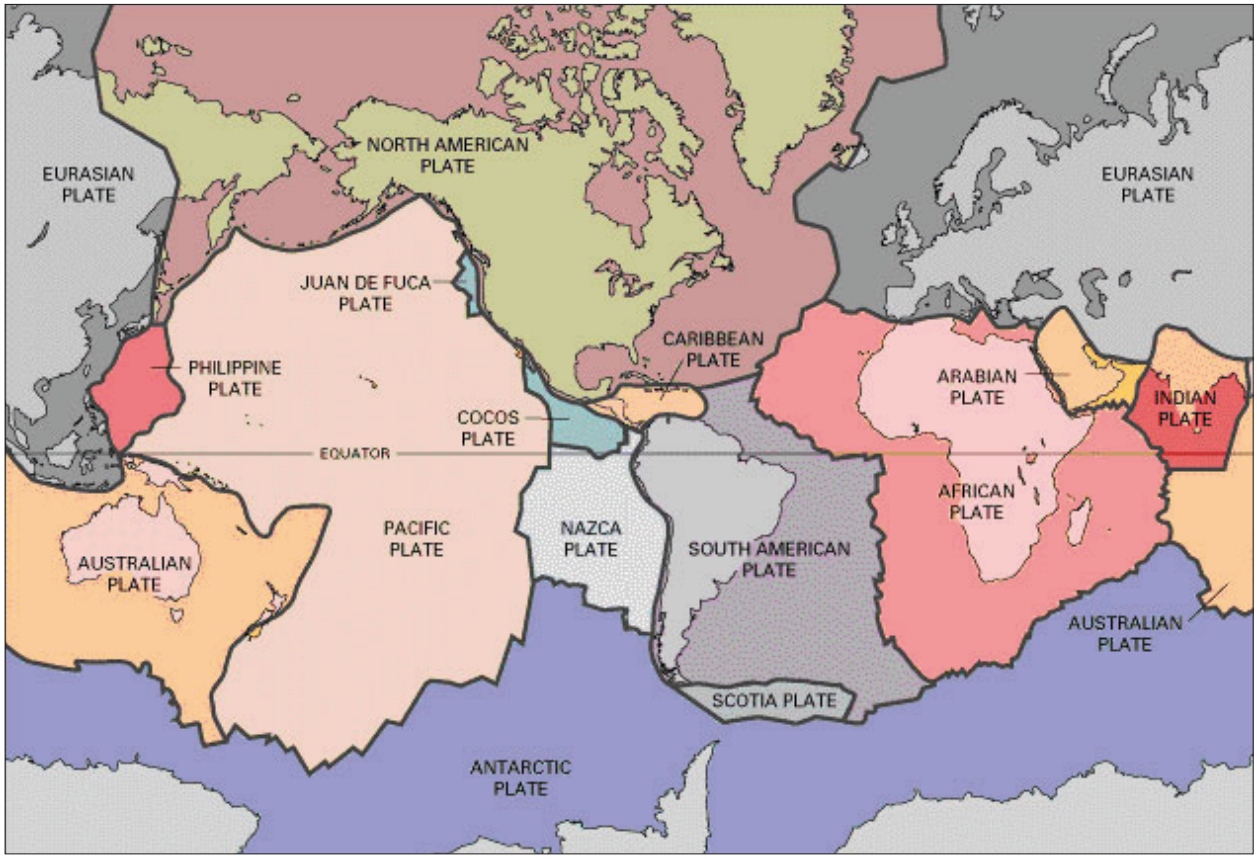
Given and displayed loads must not be exceeded at any given moment.

Introduction

Earthquakes

It is estimated that around 500,000 earthquakes occur every year which are detected with current instrumentation, but only 100,000 of these are felt.

Most of these earthquakes are caused by global movement of the Earth´s tectonic plates.

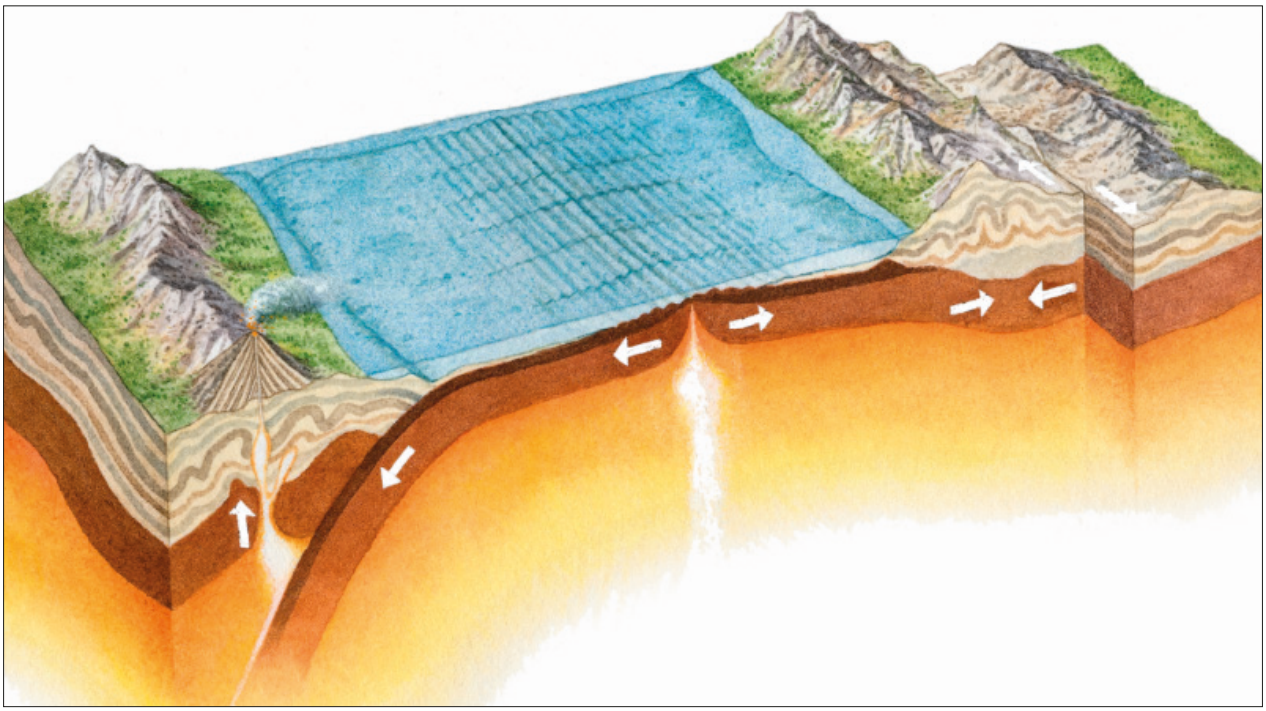


(Source: https://en.wikipedia.org/wiki/Plate_tectonics)

Tectonic earthquakes occur anywhere in the earth where there is sufficient stored elastic strain energy to drive fracture propagation along a fault plane.

A fault is a fracture in the earth´s crust

The sides of a fault plane can move past each other in three different ways as shown.



(Source: https://www.dkfindout.com/us/earth/tectonic-plates/)

Earthquakes caused by slippage alongside the tectonic plates are called interplate earthquake.

All tectonic plates also have internal stress fields caused by their interactions with neighboring plates. These stresses may be sufficient to cause failures along existing fault planes, giving rise to intraplate earthquakes.

The movement caused by the slippage creates waves in the earth´s crust, traveling away from the fault plane. These waves change throughout the duration of the earthquake, add to one another and result in extremely complicated wave motion and vibrations. The direction of forces on structures can be horizontal, vertical or rotational. In terms of their effect on a given building, they are not only unpredictable in direction but also unpredictable in strength and duration.

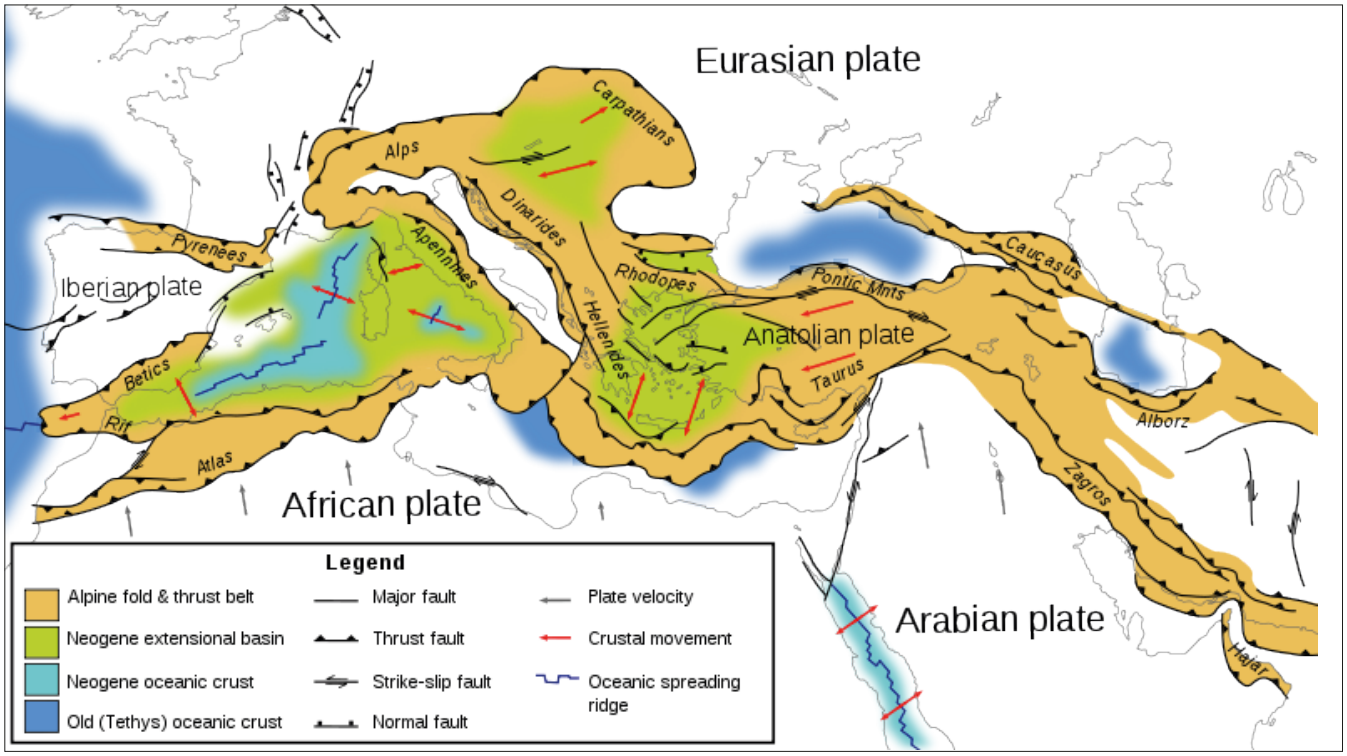
The structural load is proportionally to the intensity of shaking and to the weight of the supported elements.

Seismic loads are the horizontal and vertical forces exerted on a structure during an earthquake. They can act in any direction, therefore the primary emphasis in seismic design is on longitudinal and transversal forces.

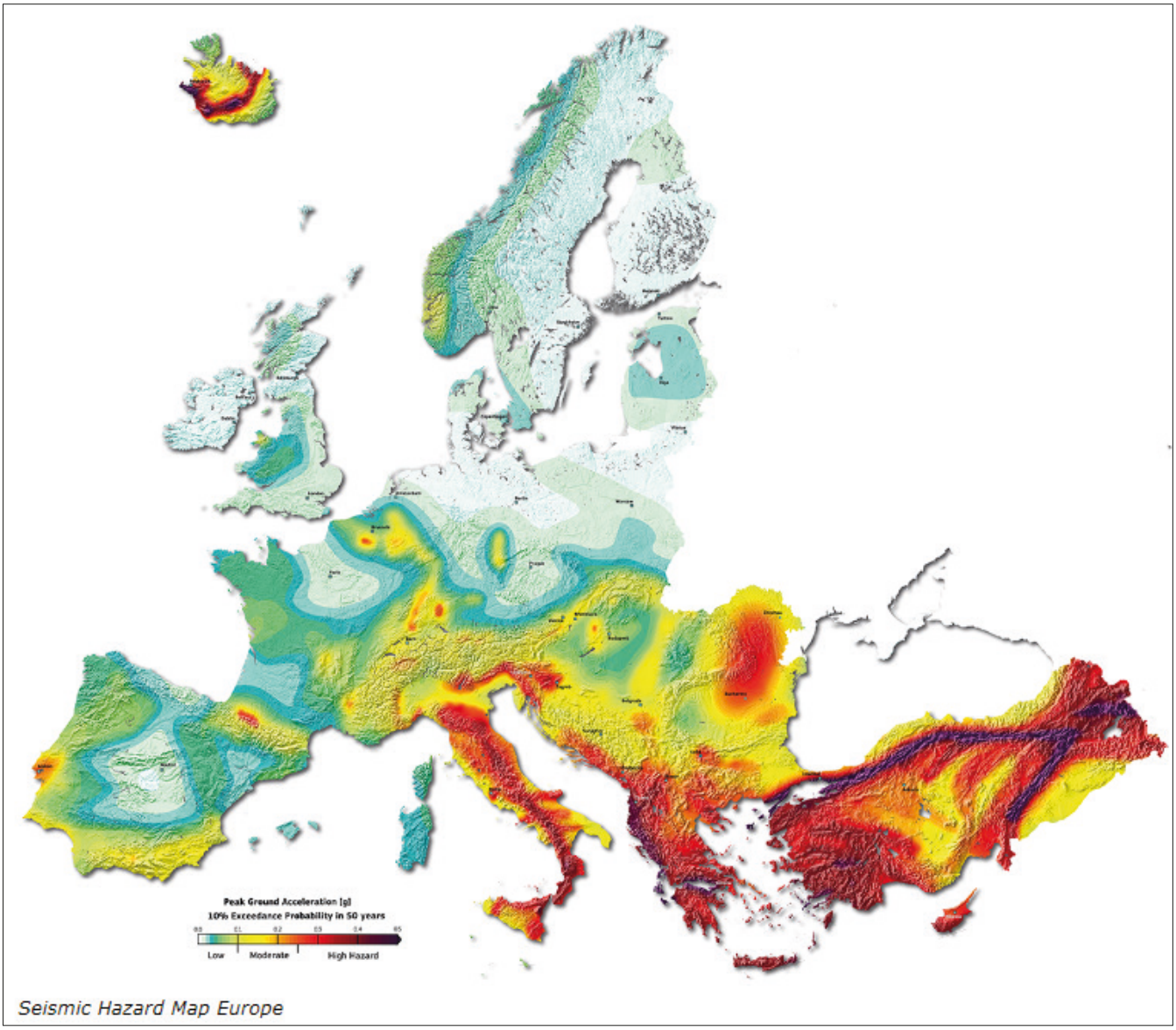
General

Seismicity in Europe

Earthquakes in Europe are mainly based on tectonic activities of the Eurasian plate with the respect of the neighbouring plates in the South (African plate), in the Southeast (Anatolian microplate) and West (North-American plate).



(Source: Wikipedia-Alpine orogeny)



(Source: Swiss Seismological Service)

European countries like Portugal, Spain, France, Switzerland, the Czech Republic, the Slovakian Republic, Germany, Hungary and Austria are affected by seismic actions but Italy, Greece, the Balkan area especially Romania and ofcause Turkey are most effected by high hazards.

Nevertheless EN 1998 and the National Annexes of the listed countries set the rules for the design of earthquake proof structures.

EN 1998 has to be seen in line with EN 1990 for the basic equation of seismic actions, EN 1090 for steel structures and EN 1993-1-1 for the verification of the load bearing capacity of steel structures.

The basic design principle of the Eurocode is based on different design situations of so called ultimate limit states, so also for the design situation of an earthquake.

Seismic zones of European countries (Dlubal GmbH):

Germany	Switzerland	France	Greece	Czech Republic	Croatia	Slovakian Republic
Austria	Italy	Spain	Portugal	Romania	Slovenia	Bulgaria

Germany



Earthquake Design Process of Non-Structural Elements

Non-structural elements (NSE)

Non-structural elements are considered to be not part of the supporting framework of the building. Typical non-structural elements are building claddings, facades or suspended ceilings, but also installations and equipment of engineering service such as pipelines , ductwork, cable trays, bus bars, fan coil units and floor mounted components.

Equivalent lateral force procedure

Most international standards allow the so called “equivalent static force method” to be used for calculation the seismic forces.

The seismic actions on non-structural elements are considered as quasi static action, not dynamic.

But in any case the National Annexes have to be considered in terms of exclusions and additional requirements for verification of the effects of the actions.

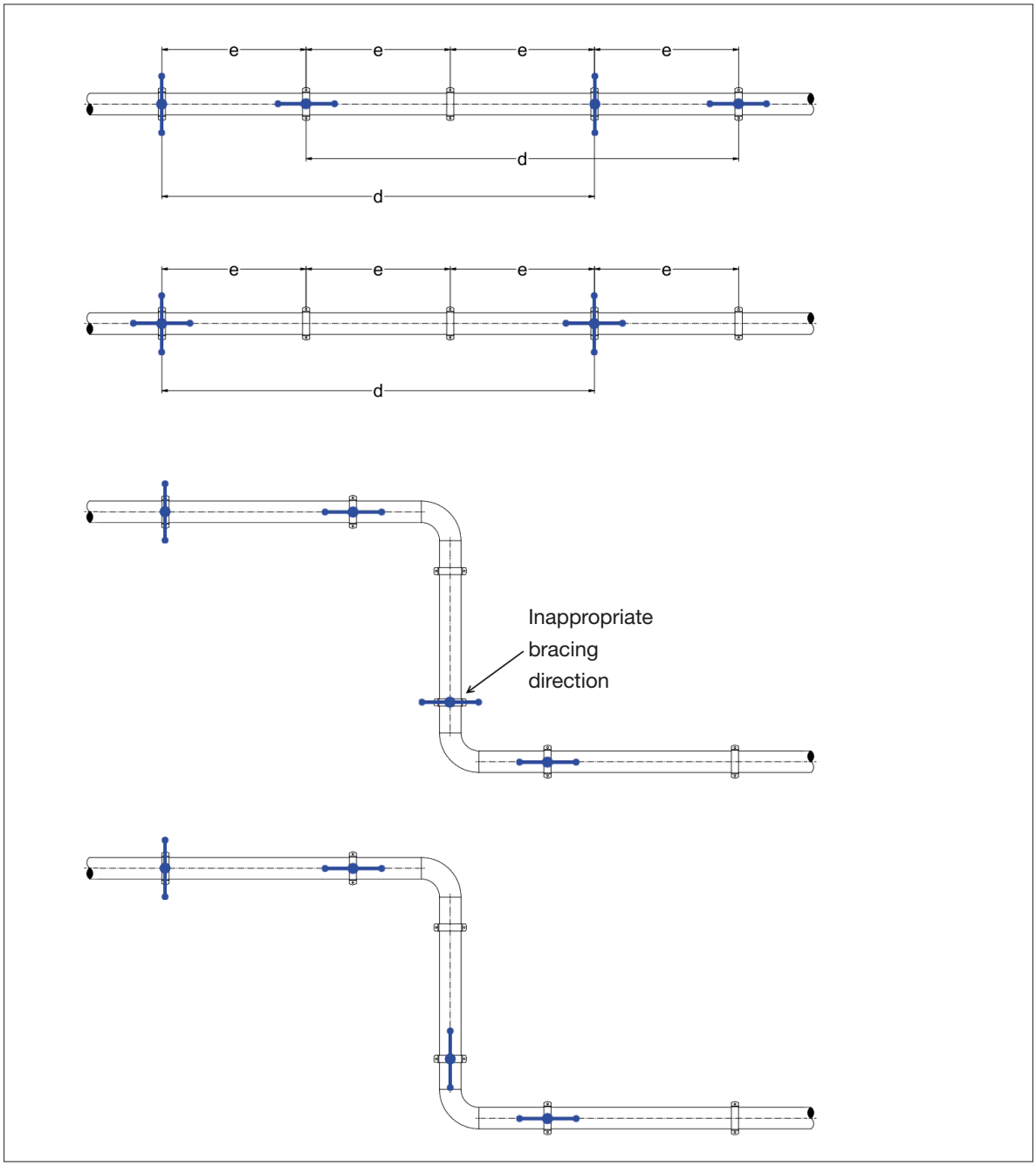
Seismic restraint layout of Engineering Services- Basic rules

Braces or restraints for earthquake resistant installations can be divided into 3 types:

1. Longitudinal bracing:

2. Transversal bracing:

3. 4-way-bracing



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Assembly - Single pipe

Single assembly SP



SP

Longitudinal bracing



SP-TLo



SP-T4Lo 1



SP-T4Lo 2

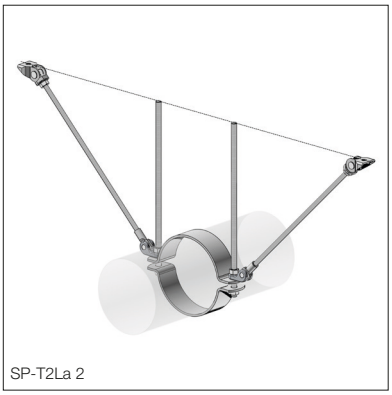
Lateral bracing



SP-TLa

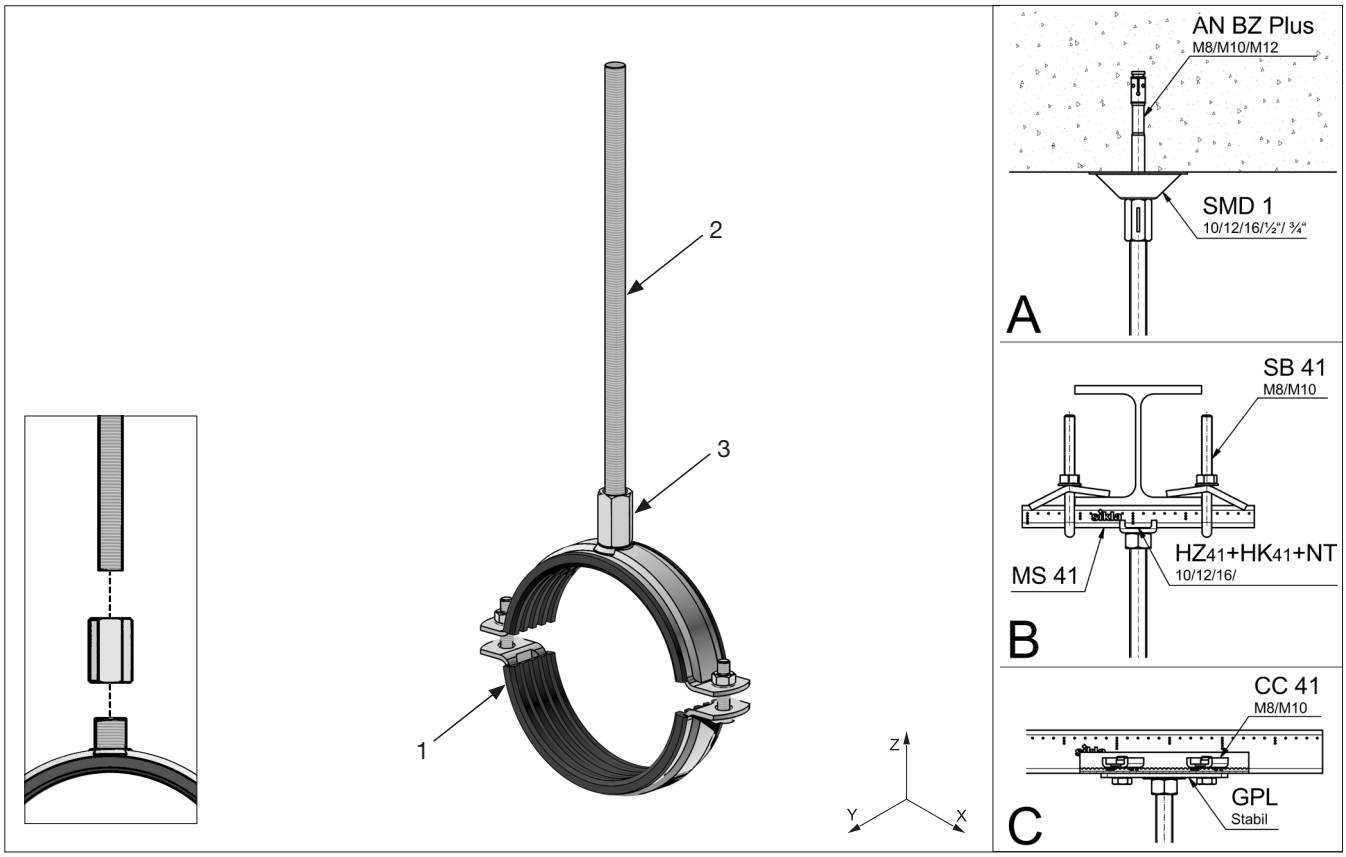


SP-T2La 1



SP-T2La 2

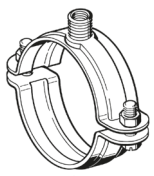
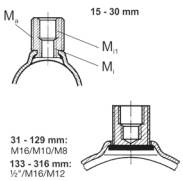
Pipe – Single assembly SP

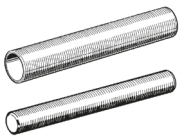


Application

Individual assembly without bracing.

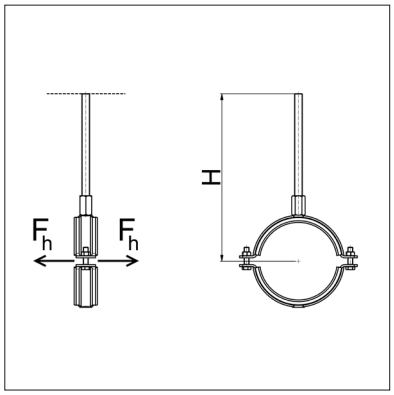
Parts list




Item 1: Stabil D-3G		Item 2: GST / GR	Item 3: AD IG/IG
$Ø_{min}$ [mm] (Part no.)	$Ø_{max}$ [mm] (Part no.)	Dimension	Dimension
15-19 (107705)	124-129 (115766)	M12, M16, ½", ¾", 1"	M16 → M10;M12;M16;½";¾";1"
133-140 (107130)	310-316 (147600)	M12, M16, ½", ¾", 1"	½" → M10;M12;M16;½";¾";1"

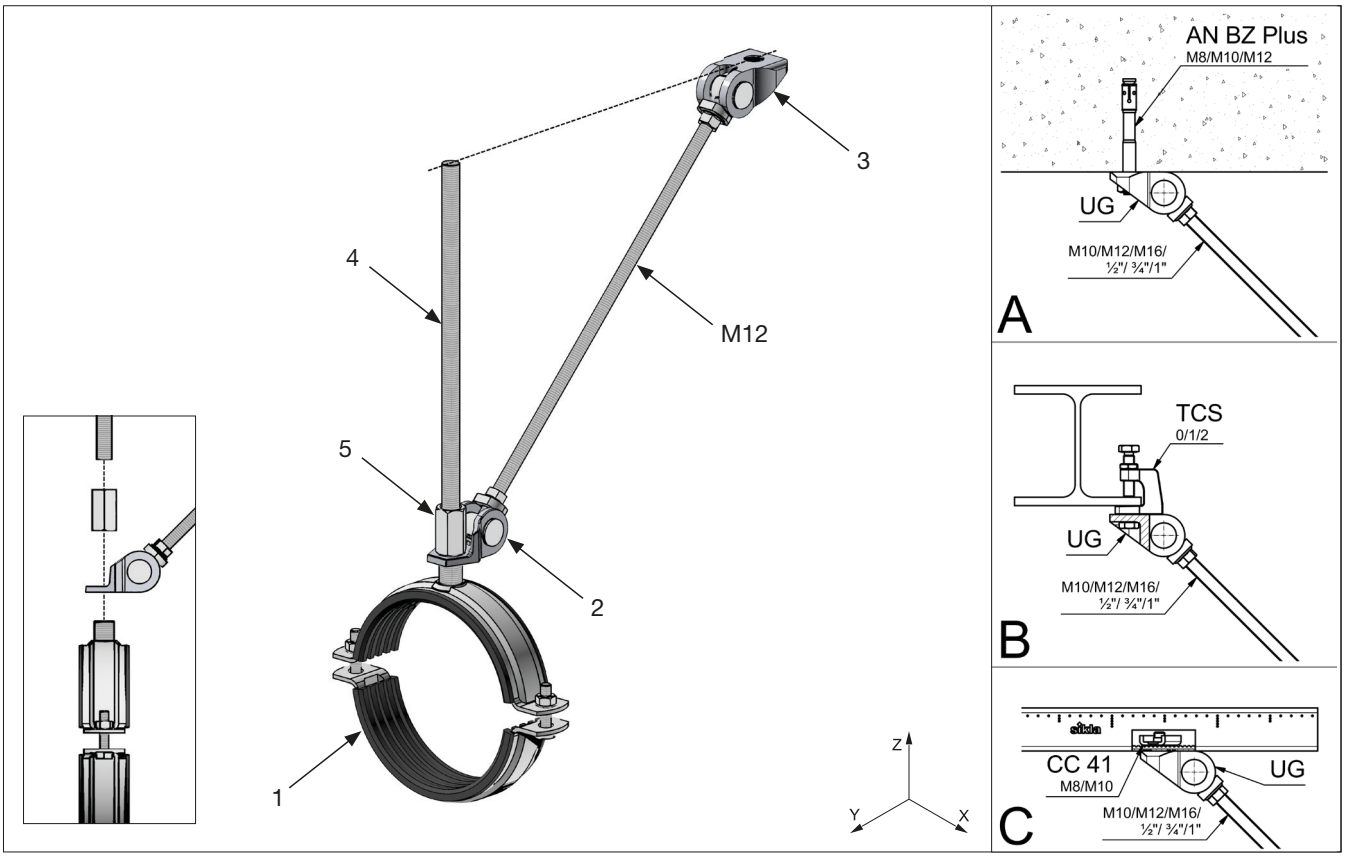
Max. recommended load under seismic impact



Permissible load according to type of assembly [1]			
H_{max} [3] [m]	$F_{RD,S,eq}$ ($F_{1'}$) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	0,67	0,30	0,39
0,4	0,23	0,13	0,17
0,6	0,13	0,08	0,11
0,8	0,09	0,06	0,08

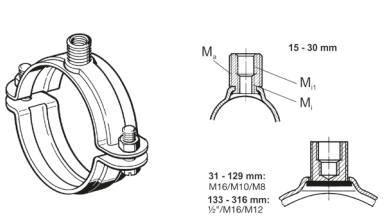
1) Values are avalid for installations with Threaded rod R ½", under seismic impact. Please contact Sikla application engineering for further types of threads.
2) max. permissible bending moment
3) H_{max} = 0.8 m

Single pipe: Longitudinal bracing SP-TLo



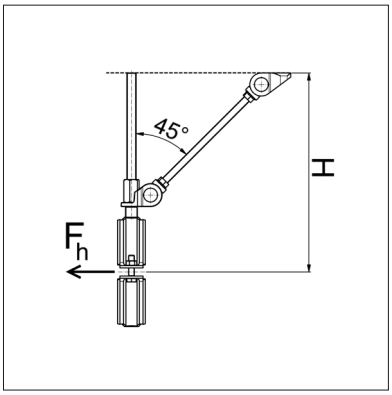
Application
Assembly for absorbing longitudinally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list



Item 1: Stabil D-3G		Item 2: UG FP	Item 3: UG	Item 4: GST / GR	Item 5: AD IG/IG
$Ø_{min}$ [mm] (Part no.)	$Ø_{max}$ [mm] (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)
15-19 (107705)	124-129 (115766)	FP M12 (158093)	M12 (158075)	M16 / M10	M16x40 (124957)
133-140 (107130)	310-316 (147600)	FP M12 (158093)	M12 (158075)	1/2" / M16 / M12	M16x40 (124957)

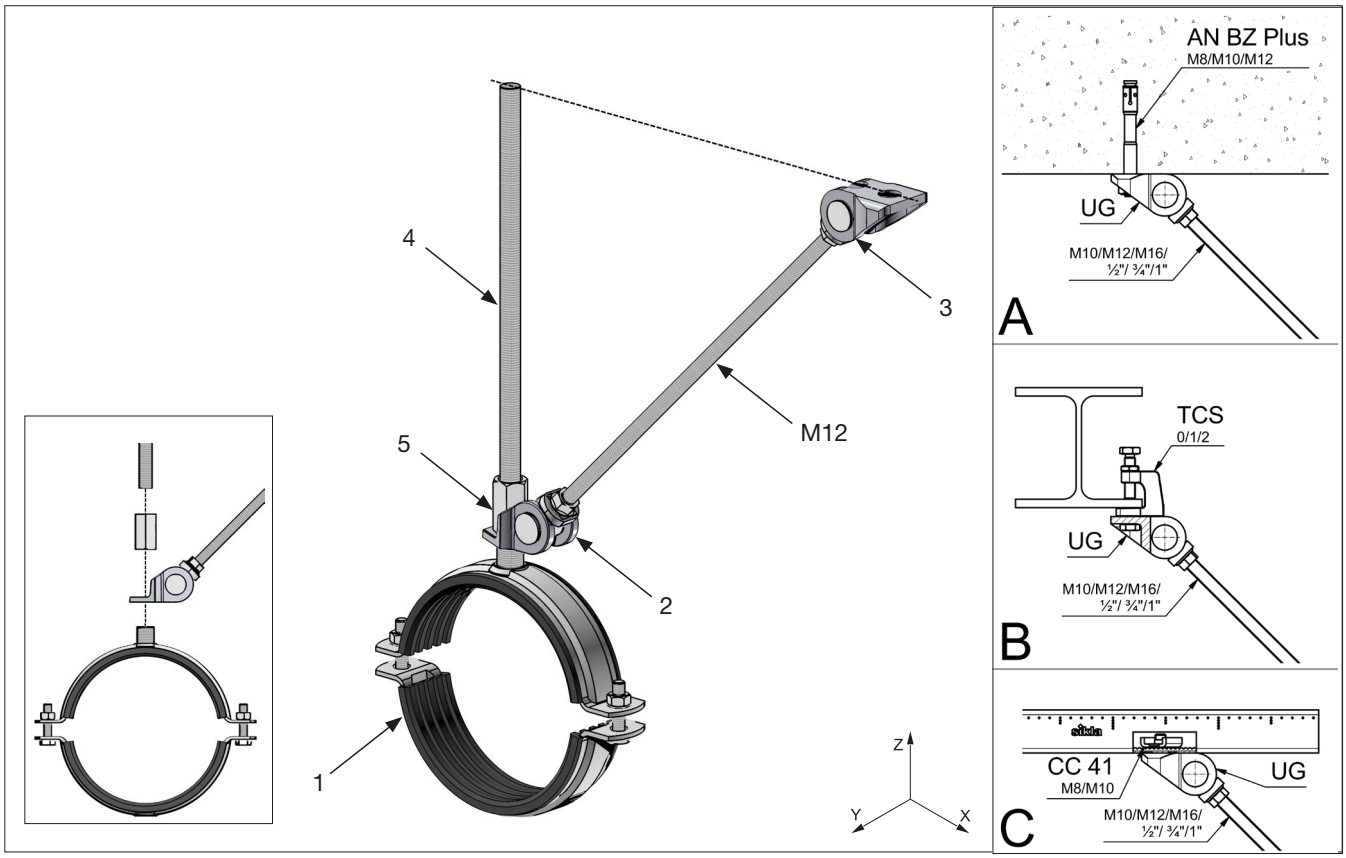
Max. recommended load under seismic impact



Permissible load according to type of assembly [1]			
H_{max} [3] [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	2,79	1,74	1,16
0,4	2,55	1,60	1,06
0,6	2,50	1,56	1,04
0,8	2,47	1,55	1,03

[1] Values valid for assembly with M16 + M12 strut, under seismic impact. Please contact Sikla application engineering for further types of threads.
[2] max. permissible tension / compression force of the strut
[3] H_{max} = 0.8 m

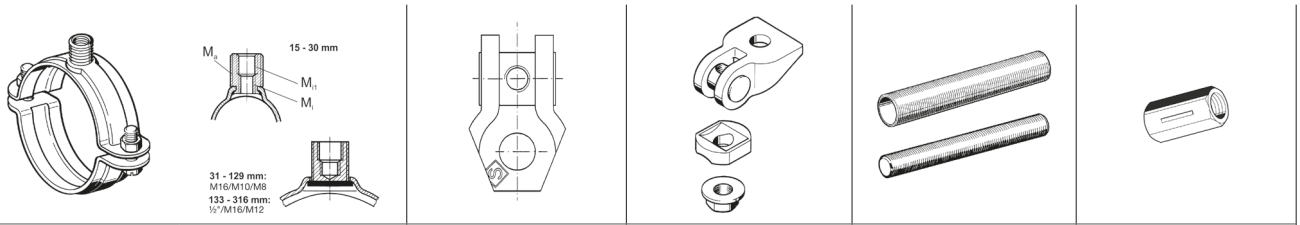
Single pipe: Lateral bracing SP-TLa



Application

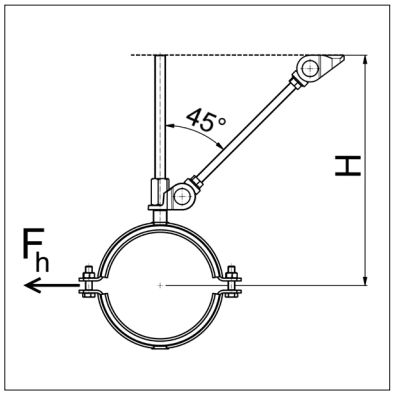
Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list



Item 1: Stabil D-3G		Item 2: UG FP	Item 3: UG	Item 4: GST / GR	Item 5: AD IG/IG
$Ø_{min}$ [mm] (Part no.)	$Ø_{max}$ [mm] (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)
15-19 (107705)	124-129 (115766)	FP M12 (158093)	M12 (158075)	M16 / M10	M16x40 (124957)
133-140 (107130)	310-316 (147600)	FP M12 (158093)	M12 (158075)	1/2" / M16 / M12	M16x40 (124957)

Max. recommended load under seismic impact



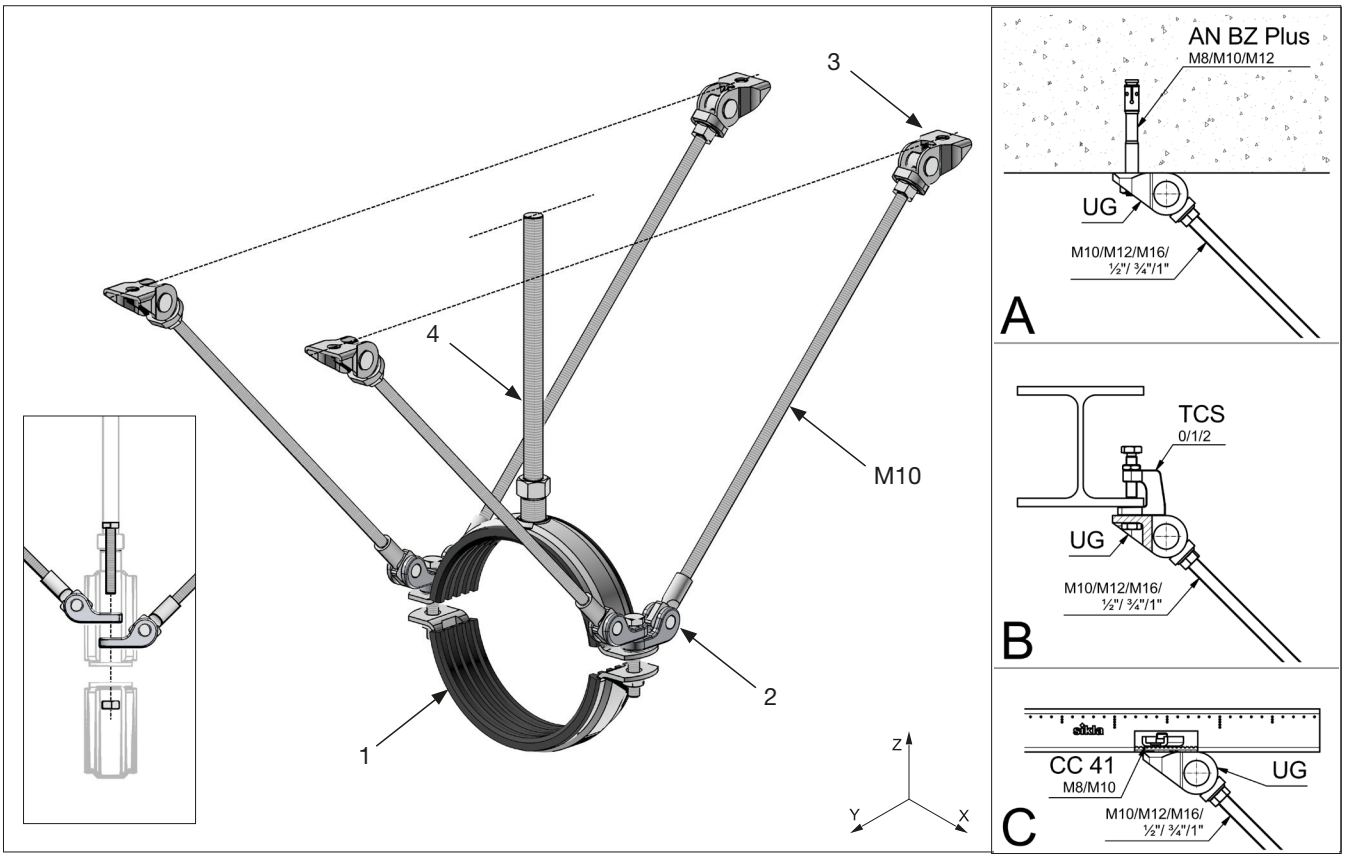
Permissible load according to type of assembly [1]

H_{max} [3] [m]	$F_{RD,S,eq}$ (F_{1i}) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	2,79	1,74	1,16
0,4	2,55	1,60	1,06
0,6	2,5	1,56	1,04
0,8	2,47	1,55	1,03

1) Values valid for assembly with M16 + M12 strut, under seismic impact. Please contact Sikla application engineering for further assembly types.
2) max. permissible tension / compression force of the strut
3) H_{max} = 0.8 m

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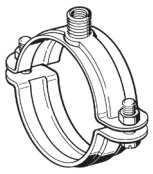
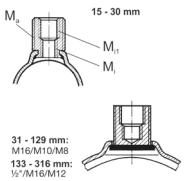
Single pipe: Longitudinal bracing SP-T4Lo 1

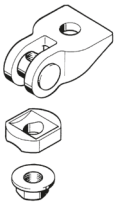
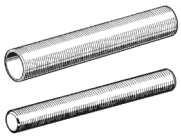


Application

Assembly for absorbing longitudinally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

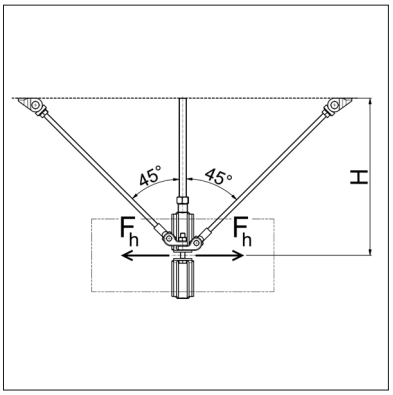
Parts list

Item 1: Stabil D-3G		Item 2: SG	Item 3: UG	Item 4: GST / GR
$Ø_{min}$ [mm] (Part no.)	$Ø_{max}$ [mm] (Part no.)	Type (Part no.)	Type (Part no.)	Dimension
133-140 (107130)	167-173 (107167)	M10-11 (115044)	M10 (198643)	1/2" / M16 / M12
176-184 (107176)	310-316 (147600)	M10-13 (115045)	M10 (198643)	1/2" / M16 / M12

Max. recommended load under seismic impact

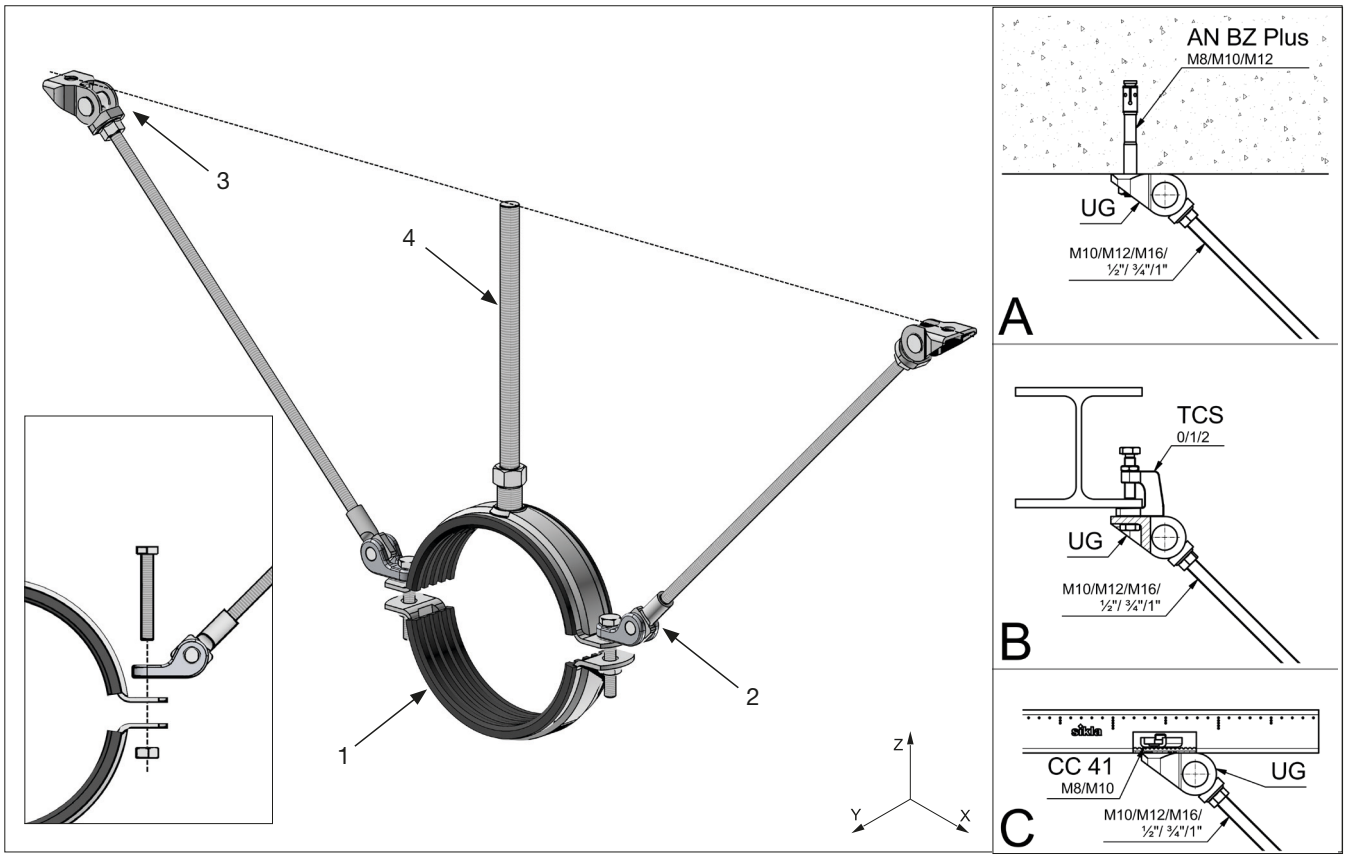


Permissible load according to type of assembly [1]

H_{max} [3] [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	7,90	4,40	3,00
0,4	6,30	2,50	1,63
0,6	5,60	2,30	1,48
0,8	5,30	2,20	1,40

1) Values valid for assembly with M16 + 4 M10 struts, under seismic impact. Please contact Sikla application engineering for further assembly types.
2) max. permissible tension / compression force of the strut
3) H_{max} = 0.8 m

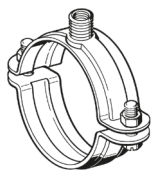
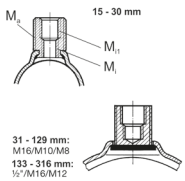
Single pipe: Lateral bracing M10 SP-T2La 1

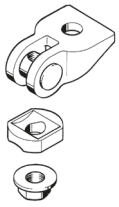
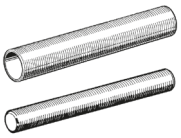


Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

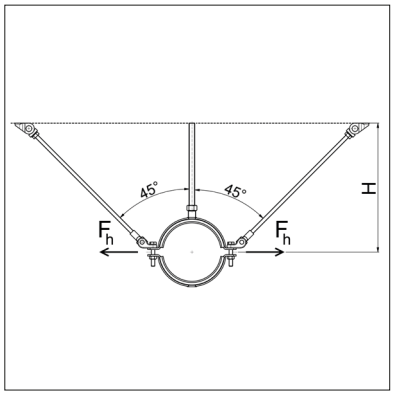
Parts list

Item 1: Stabil D-3G		Item 2: SG	Item 3: UG	Item 4: GST / GR
$Ø_{min}$ [mm] (Part no.)	$Ø_{max}$ [mm] (Part no.)	Type (Part no.)	Type (Part no.)	Dimension
133-140 (107130)	167-173 (107167)	M10-11 (115044)	M10 (198643)	1/2" / M16 / M12
176-184 (107176)	310-316 (147600)	M10-13 (115045)	M10 (198643)	1/2" / M16 / M12

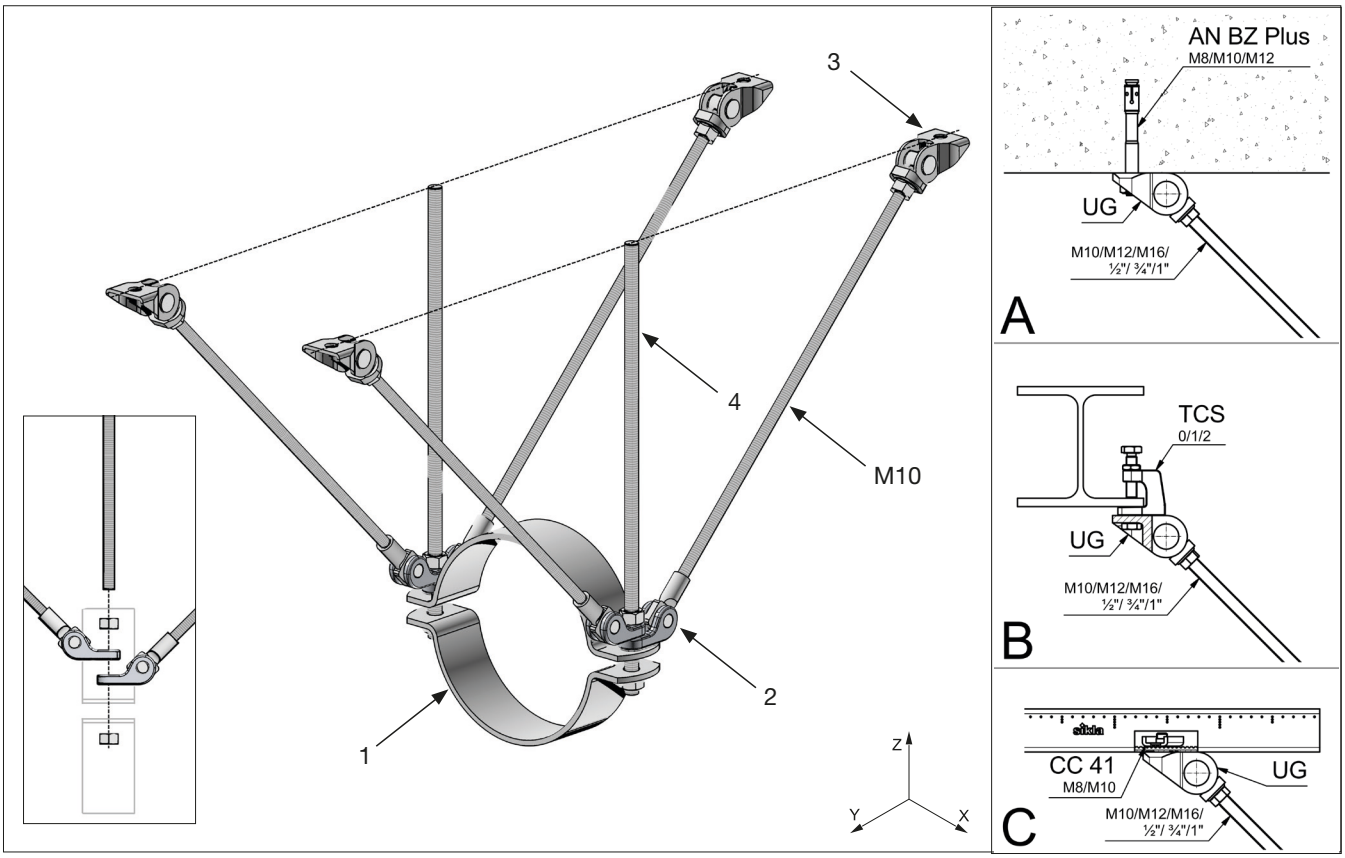
Max. recommended load under seismic impact



Permissible load according to type of assembly [1]			
H_{max} [3] [m]	$F_{RD,S,eq}$ (F_{1t}) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0.2	3.00	2.25	1.53
0.4	2.00	1.50	1.27
0.6	2.00	1.50	1.19
0.8	1.71	1.29	1.14

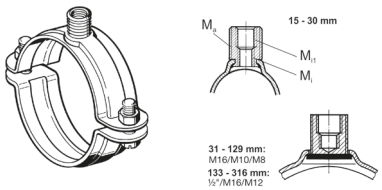
1) Values valid for assembly with M16 + 2 M10 struts, under seismic impact. Please contact Sikla application engineering for further assembly types.
2) max. permissible tension / compression force of the strut
3) H_{max} = 0.8 m

Single pipe: Longitudinal bracing SP-T4Lo 2



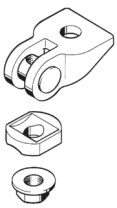
Application
Assembly for absorbing longitudinally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

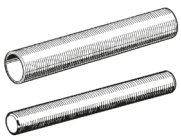
Parts list





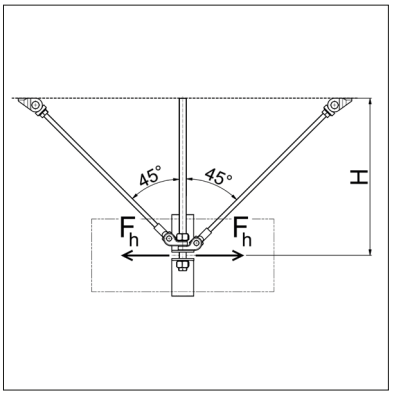






Item 1a: Stabil D-3G		Item 1b: RB-A	Item 2: SG	Item 3: UG	Item 4: GST / GR
$Ø_{min}$ [mm] (Part no.)	$Ø_{max}$ [mm] (Part no.)	$Ø_{nom}$ [mm]	Type (Part no.)	Type (Part no.)	Dimension
133-140 (107130)	167-173 (107167)	18 - 49	M10-11 (115044)	M10 (198643)	1/2" / M16 / M12
176-184 (107176)	310-316 (147600)	61 - 220	M10-13 (115045)	M10 (198643)	1/2" / M16 / M12

Max. recommended load under seismic impact

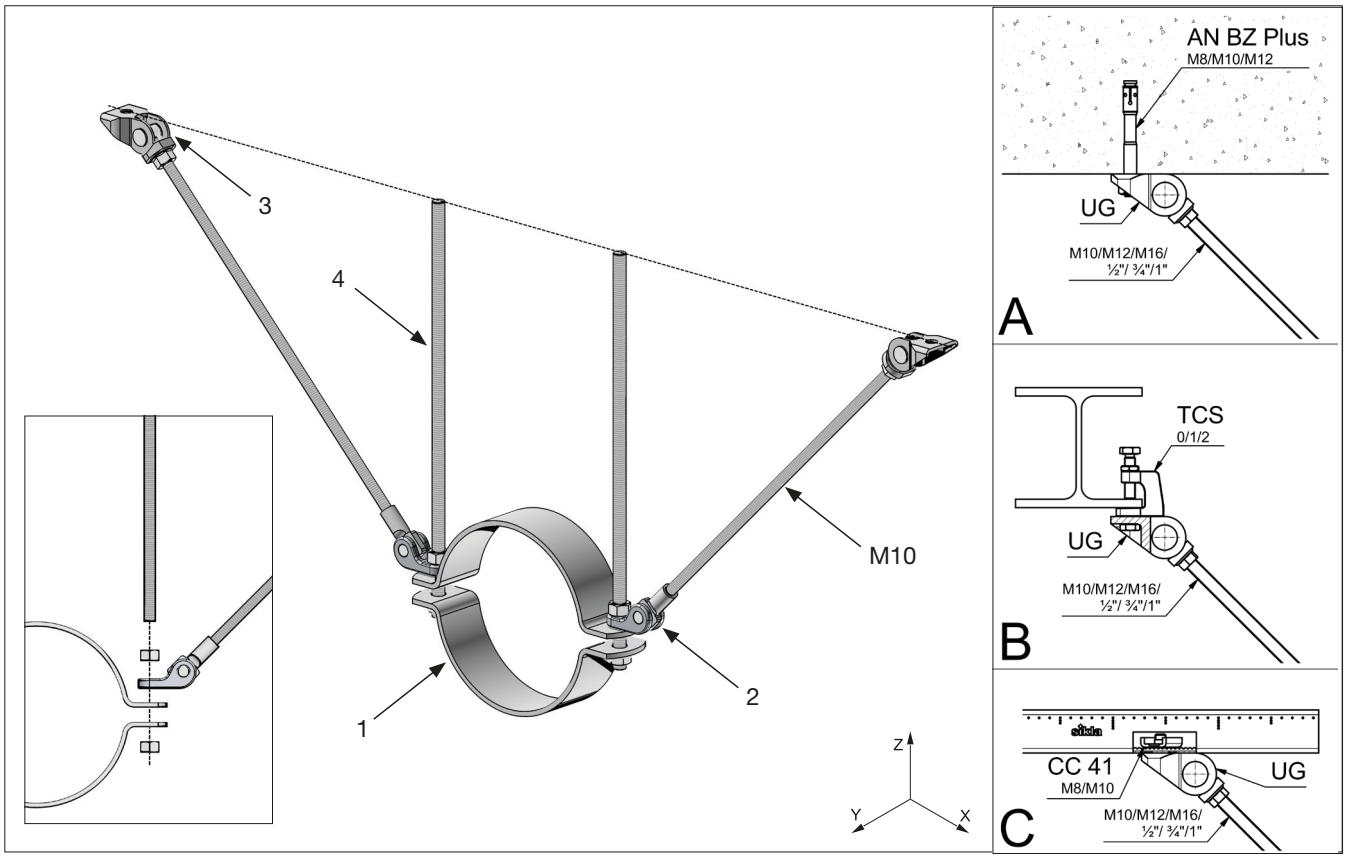


Permissible load according to type of assembly [1]

H_{max} [3] [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0.2	9.10	4.40	3.00
0.4	6.50	2.50	1.63
0.6	5.75	2.30	1.48
0.8	5.37	2.20	1.40

1) Values valid for assembly with M16 + 4 M10 struts, under seismic impact. Please contact Sikla application engineering for further assembly types.
2) max. permissible tension / compression force of the strut
3) H_{max} = 0.8 m

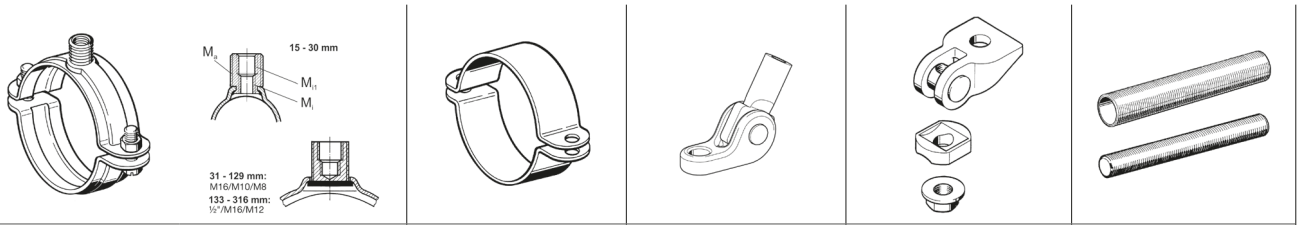
Single pipe: Lateral bracing M10 SP-T2La 2



Application

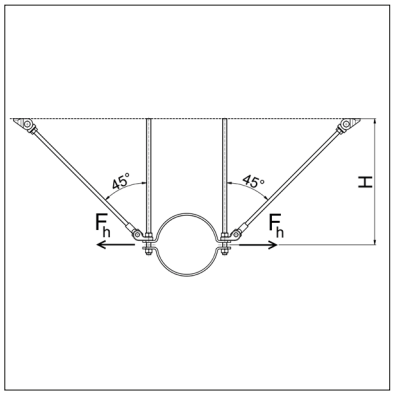
Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list



Item 1a: Stabil D-3G		Item 1b: RB-A	Item 2: SG	Item 3: UG	Item 4: GST / GR
$Ø_{min}$ [mm] (Part no.)	$Ø_{max}$ [mm] (Part no.)	$Ø_{nom}$ [mm]	Type (Part no.)	Type (Part no.)	Dimension
133-140 (107130)	167-173 (107167)	18 - 49	M10-11 (115044)	M10 (198643)	1/2" / M16 / M12
176-184 (107176)	310-316 (147600)	61 - 220	M10-13 (115045)	M10 (198643)	1/2" / M16 / M12

Max. recommended load under seismic impact



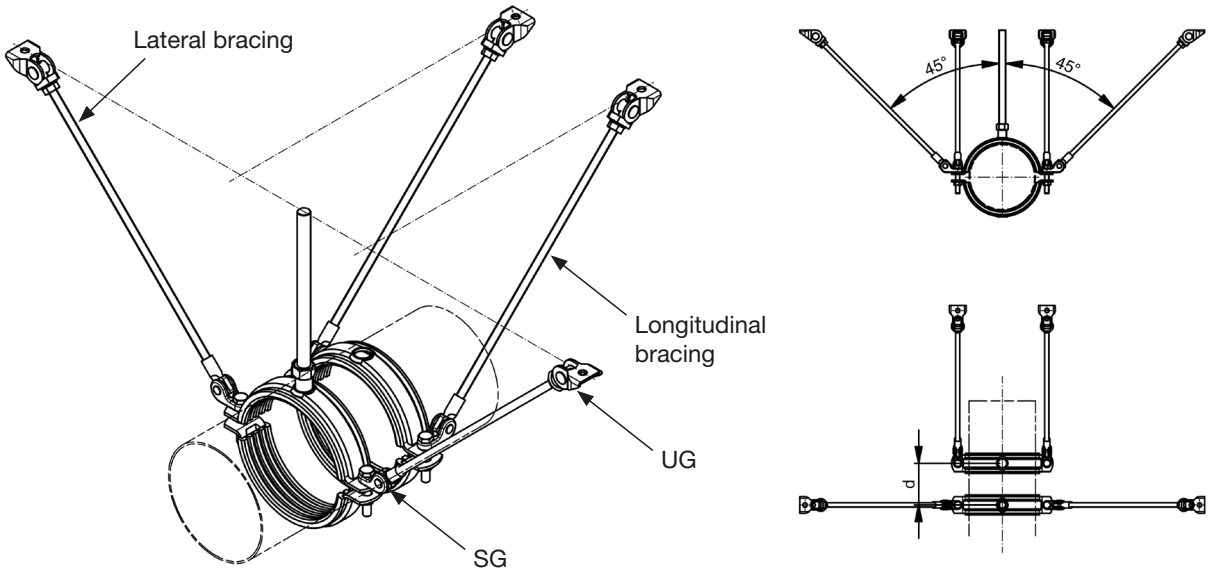
Permissible load according to type of assembly [1]			
H_{max} [3] [m]	$F_{RD,S,eq}$ (F_{1t}) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0.2	3.90	2.29	1.82
0.4	2.60	1.90	1.43
0.6	2.60	1.79	1.37
0.8	2.23	1.67	1.30

1) Values valid for assembly with M16 + 2 M10 struts under seismic impact. Please contact Sikla application engineering for further assembly types.
2) max. permissible tension / compression force of the strut
3) H_{max} = 0.8 m

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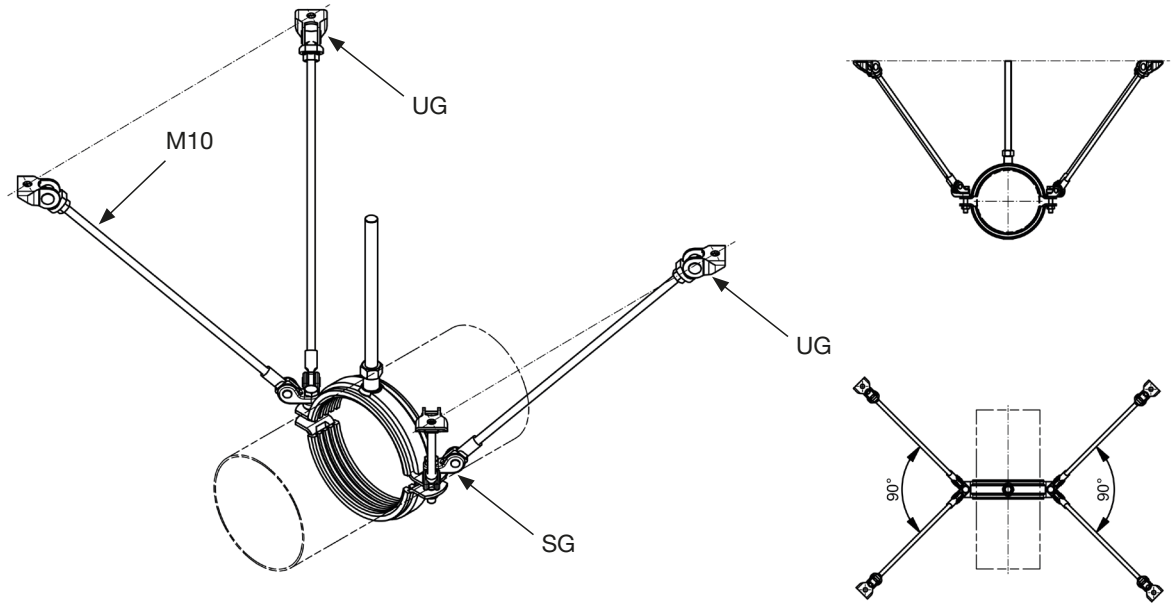
Alternative solutions

1. Lateral + longitudinal bracing with 2 pipe clamps



*For load information contact Sikla Application Technician

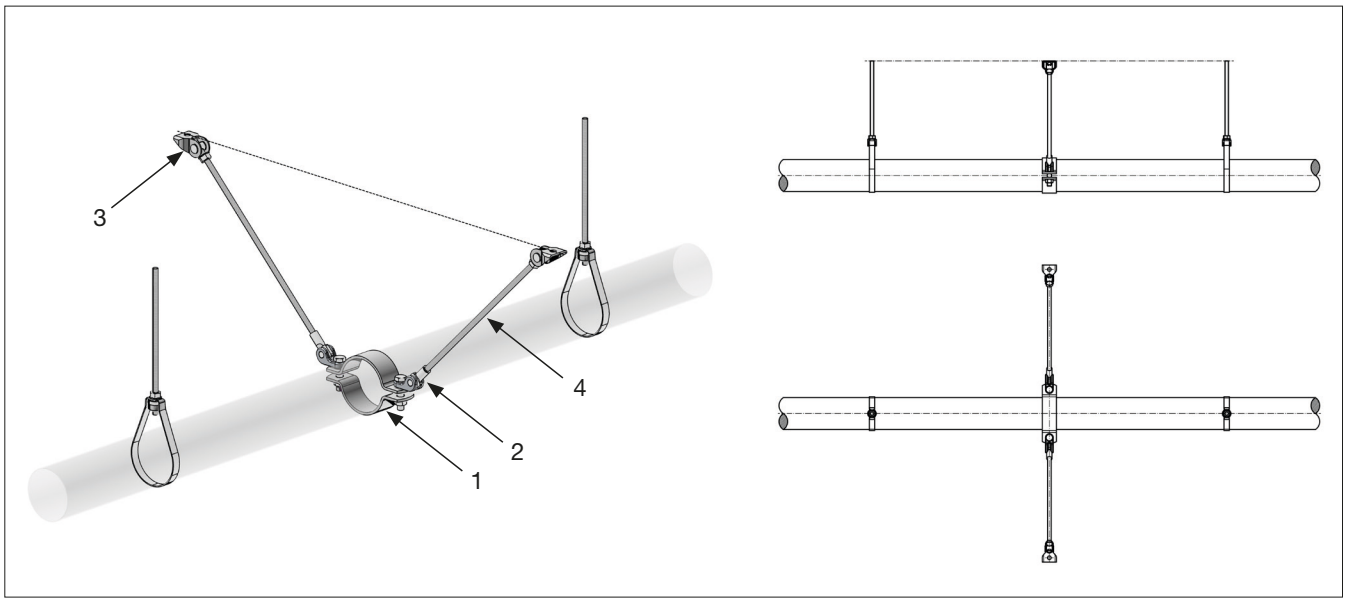
2. Lateral + longitudinal bracing: Trestle arrangement



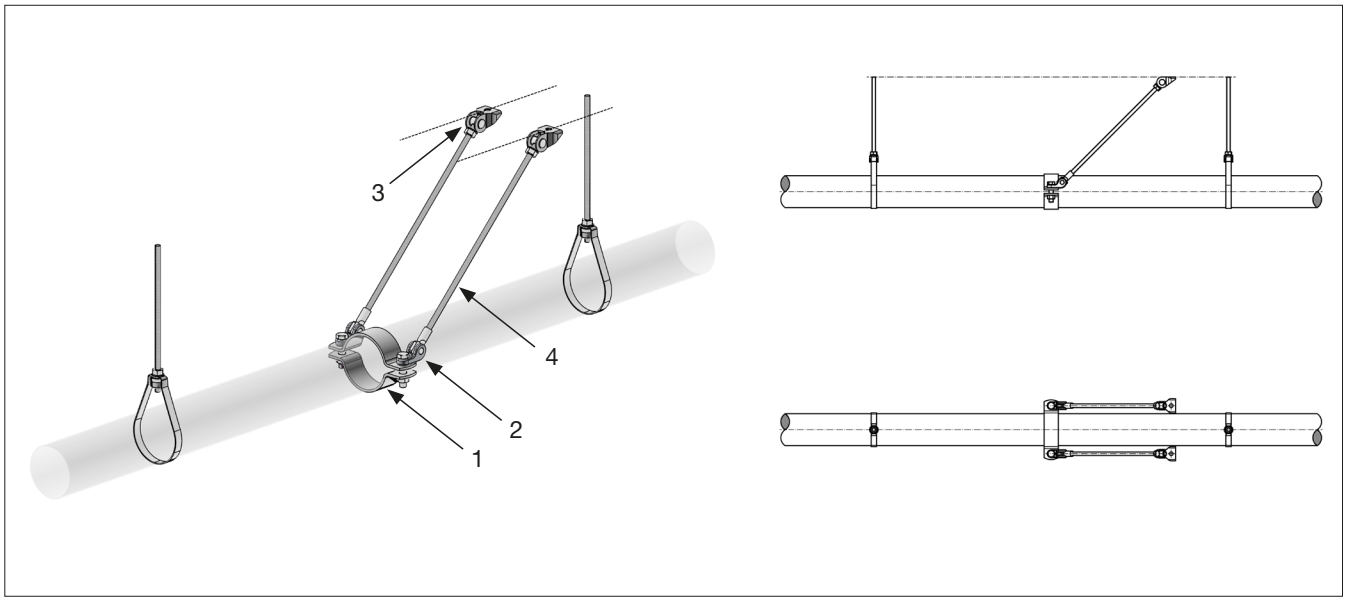
*For load information contact Sikla Application Technician

Assembly for sprinkler system

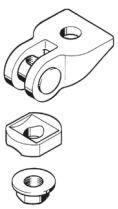
Lateral bracing



Longitudinal bracing



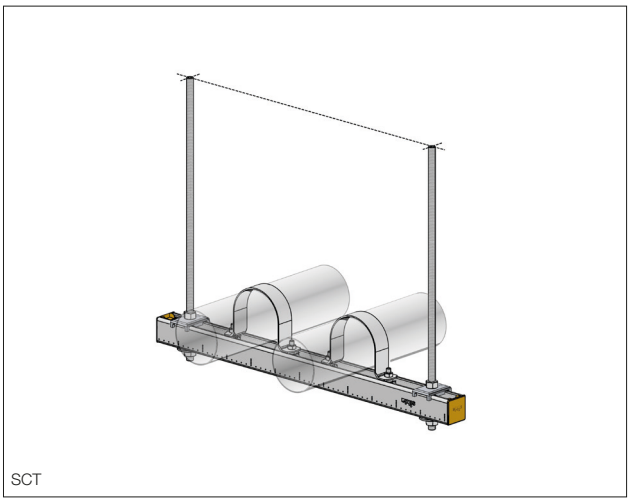
Parts list

			
Item 1: RB-A	**Item 2: SG**	**Item 3: UG**	**Item 4: GST**
Ø$_{nom}$ [mm]	Type (Part no.)	Type (Part no.)	Dimension
18 - 49	M10-11 (115044)	M10 (198643)	M10
61 - 220	M10-13 (115045)	M10 (198643)	M10

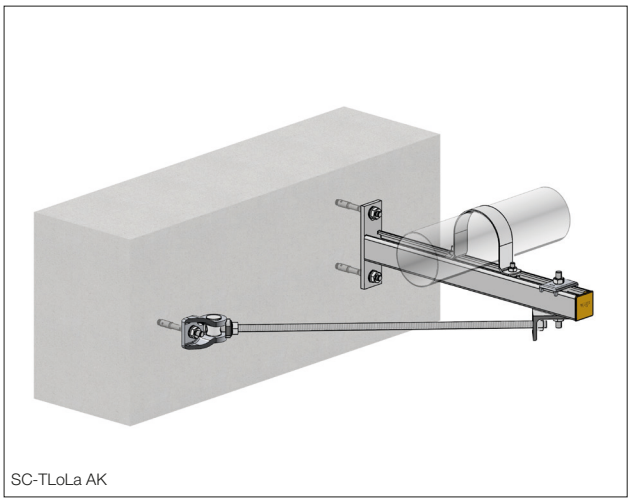
10/2019

Assembly - Channel/Threaded strut

Channel line

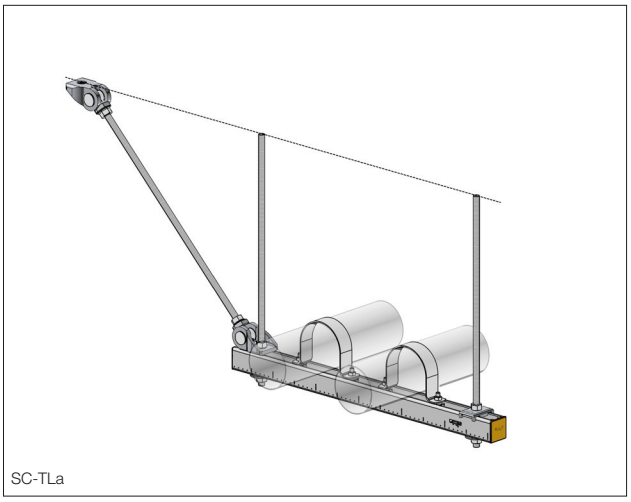


SCT

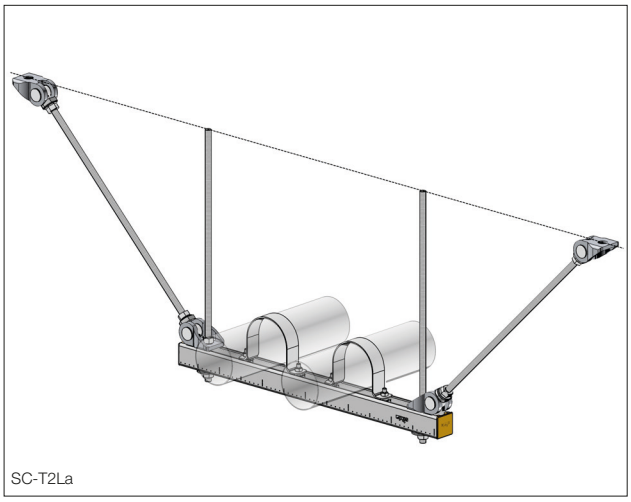


SC-TLoLa AK

Lateral bracing

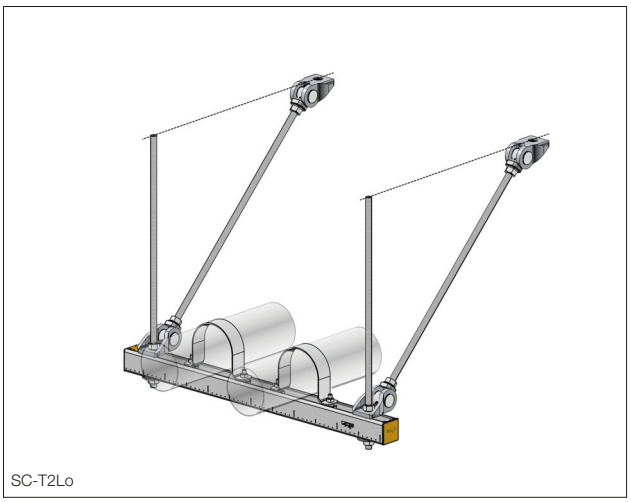


SC-TLa

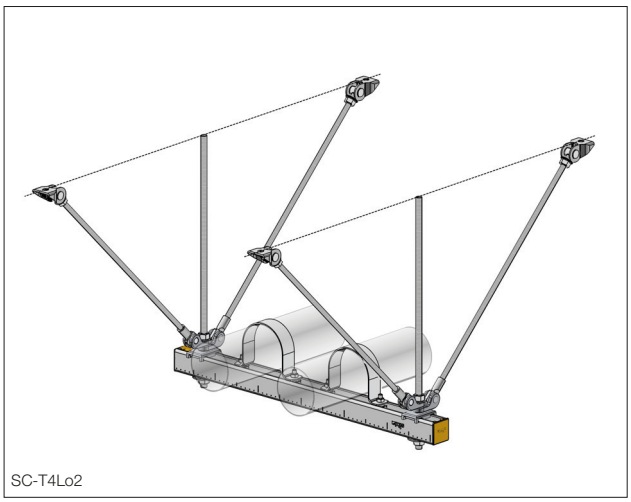


SC-T2La

Longitudinal bracing

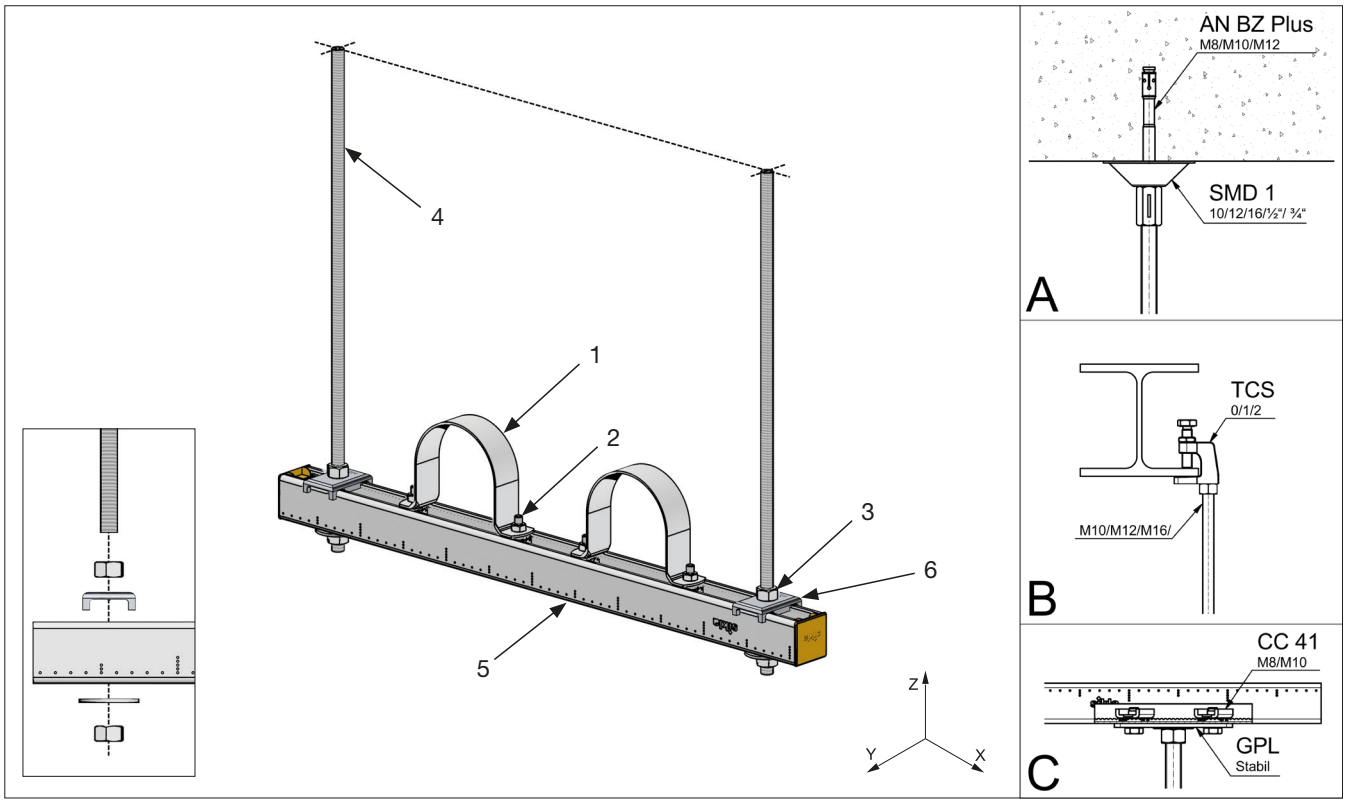


SC-T2Lo



SC-T4Lo2

SC channel line

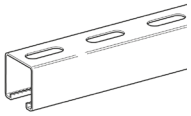
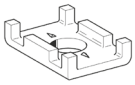


Application
Channel fixed with two vertical threaded rods.

Parts list

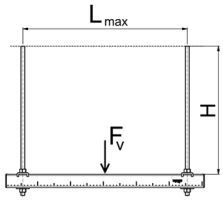




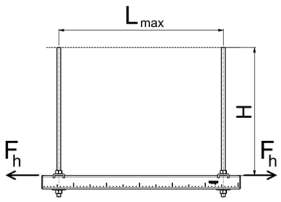
Item 1: RUC	Item 2: TBO HZ 41	Item 3: NT	Item 4: GST	Item 5: MS 41	Item 6: HK 41
Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Dimension
3/8" (159012) - 4" (159100)	M10x35 (152051)	M12 (114228)	M12 (143192)	from: 41/21/2,0 (193686)	41/12 (178256)
5" (159119) - 12" (159155)	M12x35 (152185)	M16 (114237)	M16 (110817)	to: 41-75/75/3,0 (173999)	41/16 (178265)

Max. recommended load under seismic impact

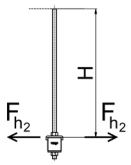


L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] (2)		
	for MS 41/21/2.0	for MS 41/41/2.0	for MS 41-75/75/3.0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

Permissible load according to type of assembly (1)



H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] (2)		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	0,44	0,30	0,44
0,4	0,22	0,15	0,22
0,6	0,15	0,10	0,15
0,8	0,11	0,08	0,11

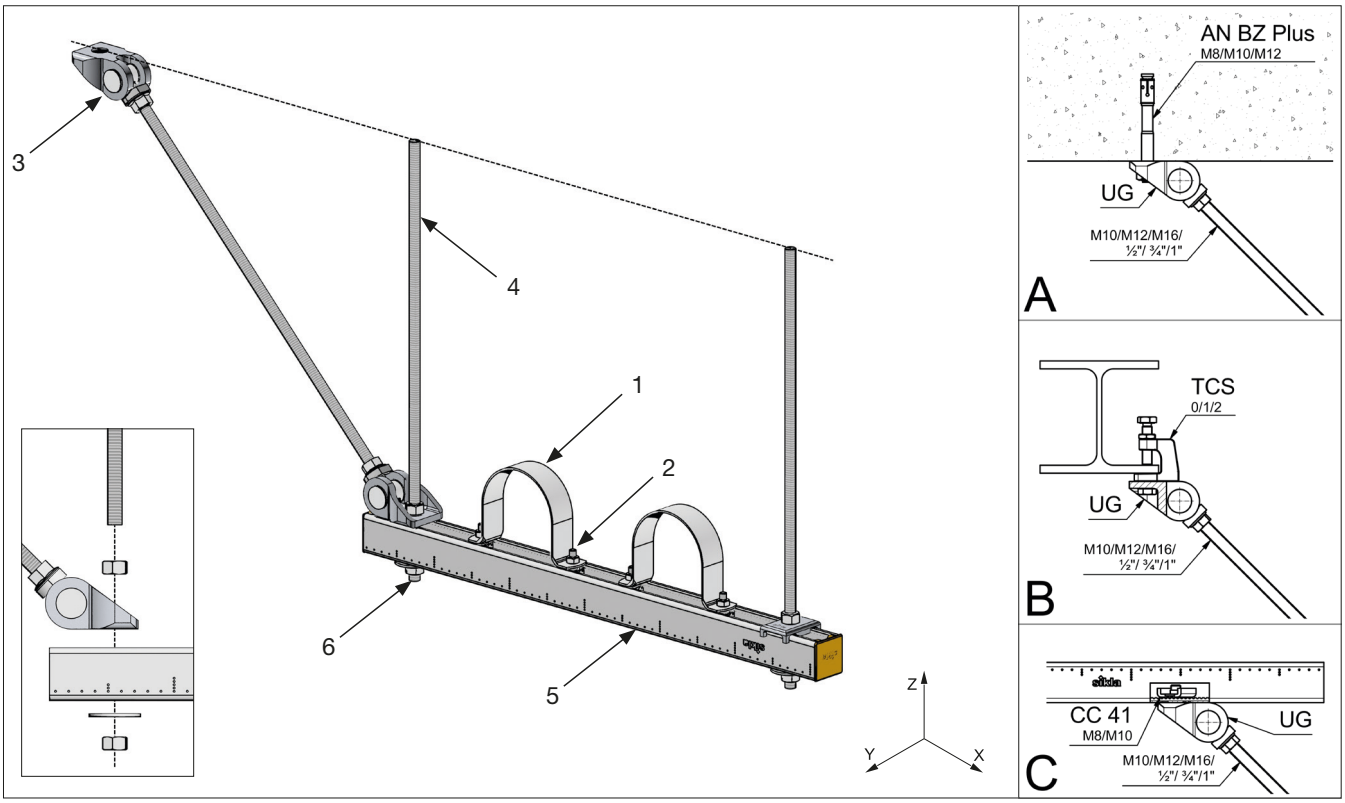


H_{max} [m]	$F_{RD,S,eq}$ (F_{h2}) [kN] (2)		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	0,44	0,30	0,44
0,4	0,22	0,15	0,22
0,6	0,15	0,10	0,15
0,8	0,11	0,08	0,11

(1) Values valid for channel with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) Max. load for channel and threaded rods. The attachment to the building structure must be verified separately.

10/2019

Channel line: SC-TLa

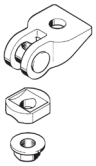


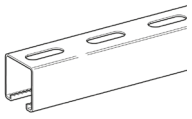
Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list

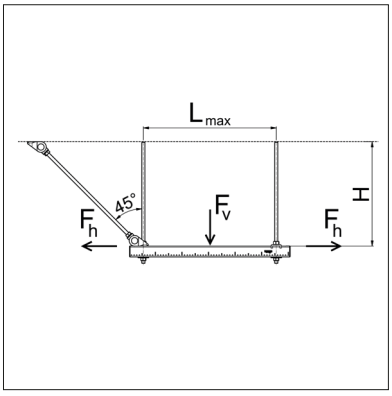







Item 1: RUC	Item 2: TBO HZ 41	Item 3: UG	Item 4: GST	Item 5: MS 41	Item 6: NT
Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	M12 (158075)	M12 (143192)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	M16 (158084)	M16 (110817)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



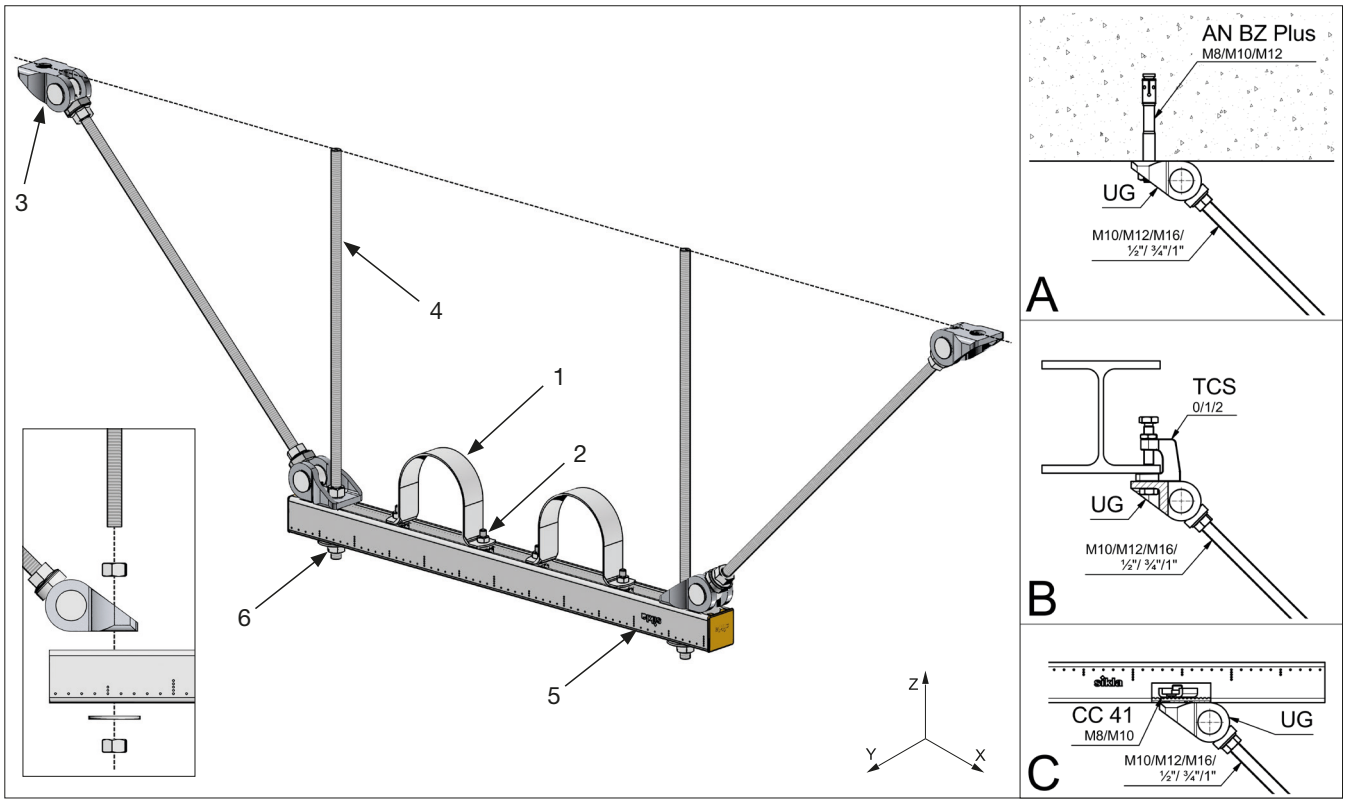
Permissible load according to type of assembly [1]

H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2 < H < 0,6	3,44	2,50	2,00
0,6 < H < 0,8	1,93	1,93	1,93

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2.0	for MS 41/41/2.0	for MS 41-75/75/3.0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channel with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

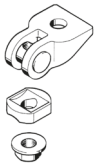
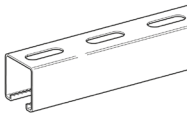
Channel line: SC-T2La



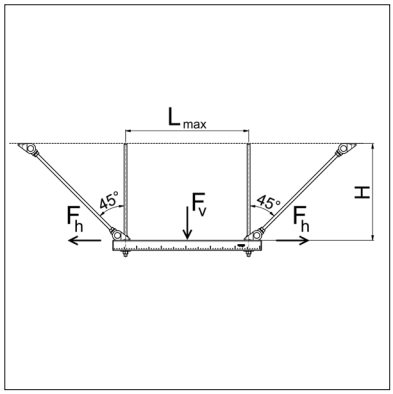
Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list

					
Item 1: RUC	**Item 2: TBO HZ 41**	**Item 3: UG**	**Item 4: GST**	**Item 5: MS 41**	**Item 6: NT**
Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	M12 (158075)	M12 (143192)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	M16 (158084)	M16 (110817)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



Permissible load according to type of assembly [1]

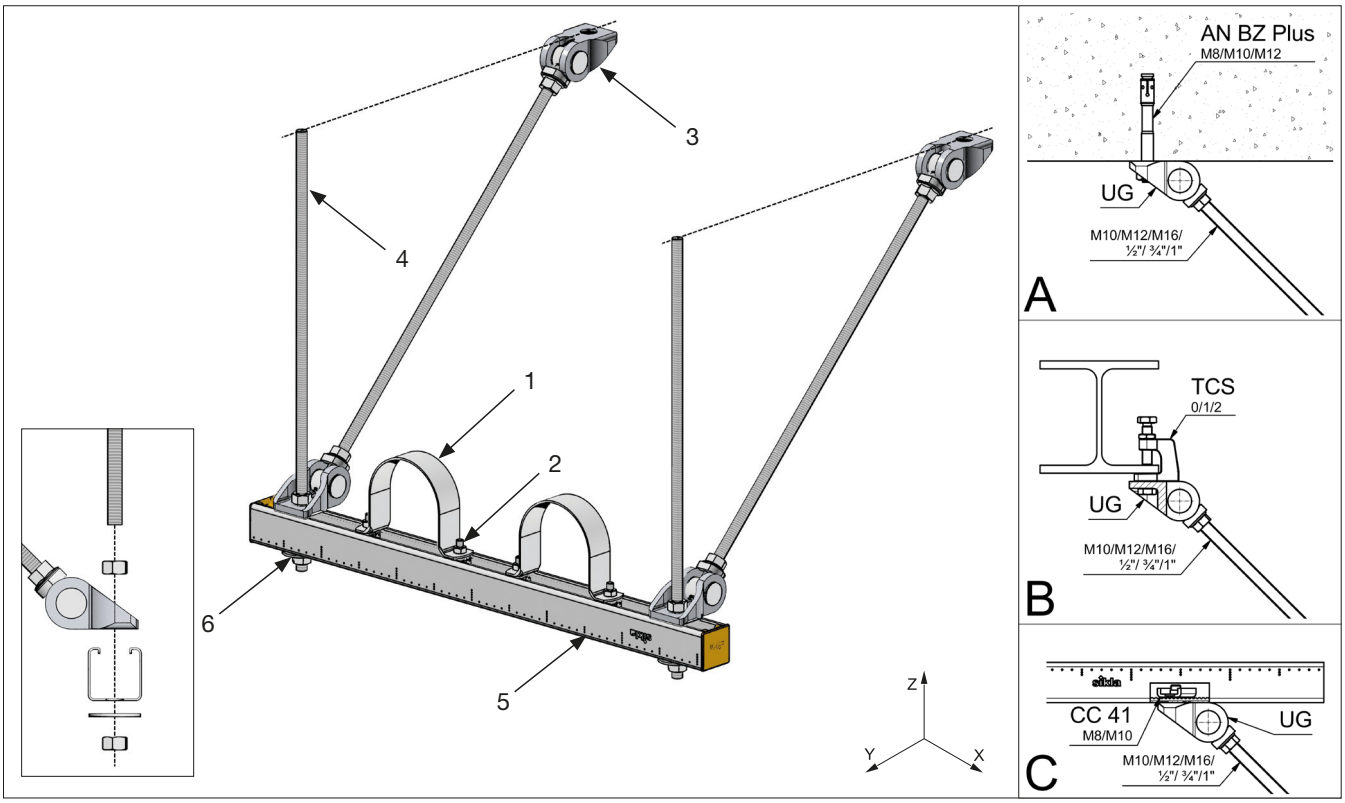
H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2 < H < 0,6	6,88	5,00	4,00
0,6 < H < 0,8	3,86	3,86	3,86

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2.0	for MS 41/41/2.0	for MS 41-75/75/3.0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channel with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

10/2019

Channel line: SC-T2Lo

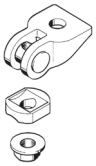


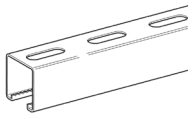
Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list

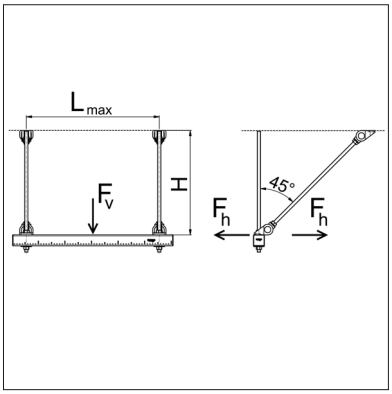







Item 1: RUC	Item 2: TBO HZ 41	Item 3: UG	Item 4: GST	Item 5: MS 41	Item 6: NT
Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	M12 (158075)	M12 (143192)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	M16 (158084)	M16 (110817)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



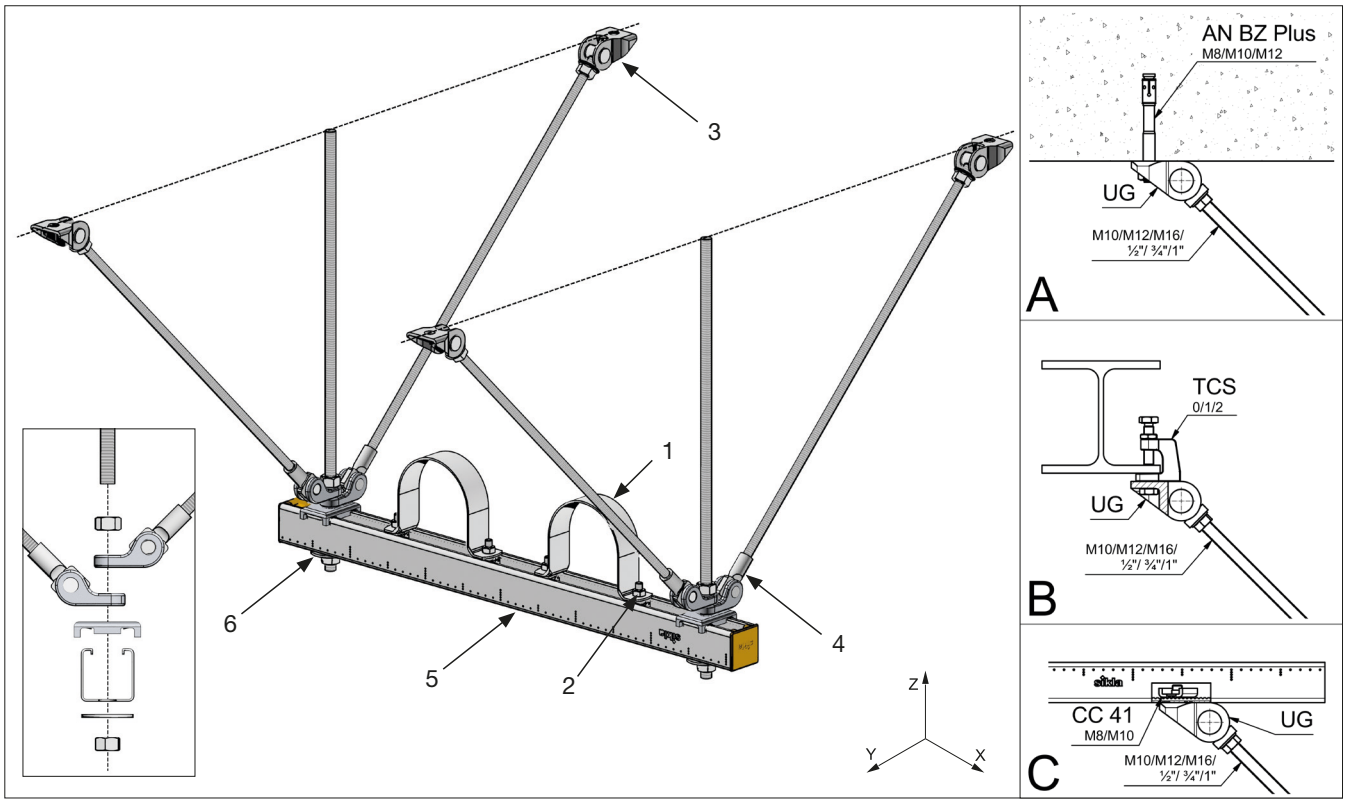
Permissible load according to type of assembly [1]

H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2] Concrete / Steel beams / MS 41 L_{max} [m]			
	0,5	1,0	1,5	2,0
0,4	4,00	4,00	3,19	2,39
0,6	4,00	4,00	3,19	2,39
0,8	3,86	3,86	3,19	2,39

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2.0	for MS 41/41/2.0	for MS 41-75/75/3.0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channels ≥ 41/41/2.0 with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

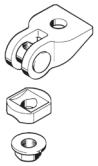
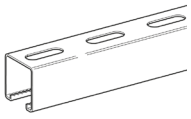
Channel line: SC-T4Lo 2



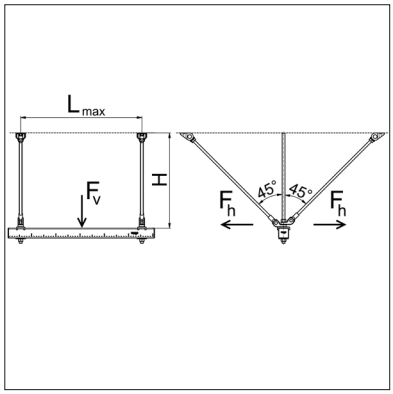
Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list

					
Item 1: RUC	**Item 2: TBO HZ 41**	**Item 3: UG**	**Item 4: SG**	**Item 5: MS 41**	**Item 6: NT**
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	M10 (198643)	M10-13 (115045)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	M10 (198643)	M10-17 (115046)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



Permissible load according to type of assembly [1]

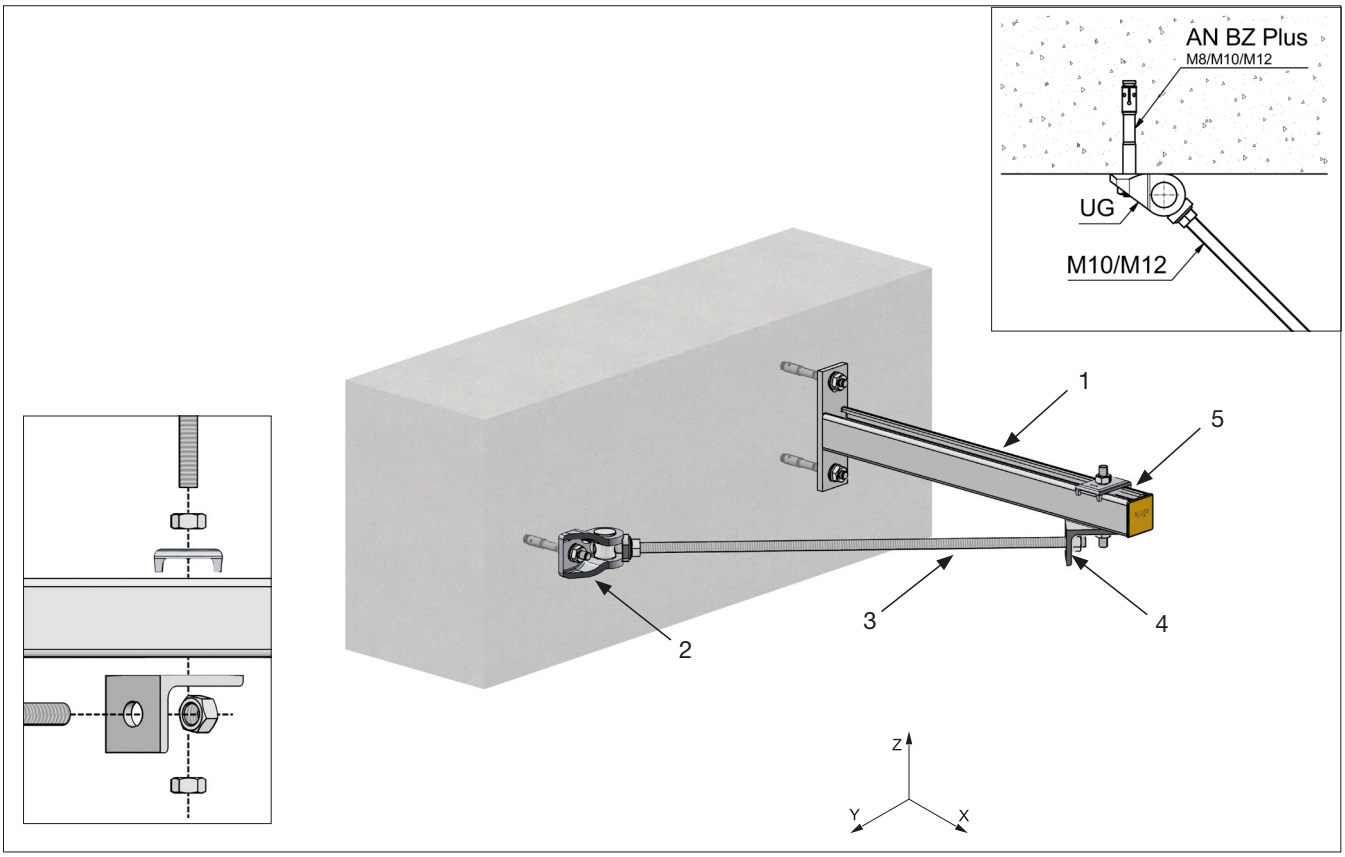
H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2] Concrete / Steel beams / MS 41 L_{max} [m]			
	0,5	1,0	1,5	2,0
0,4	7,33	4,78	3,19	2,39
0,6	3,25	3,25	3,19	2,39
0,8	1,84	1,84	1,84	1,84

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2.0	for MS 41/41/2.0	for MS 41-75/75/3.0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channels ≥ 41/41/2.0 with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

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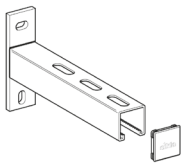
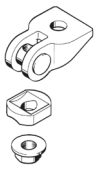
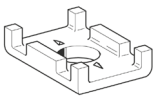
Cantilever bracket on concrete: SC-TLoLa AK



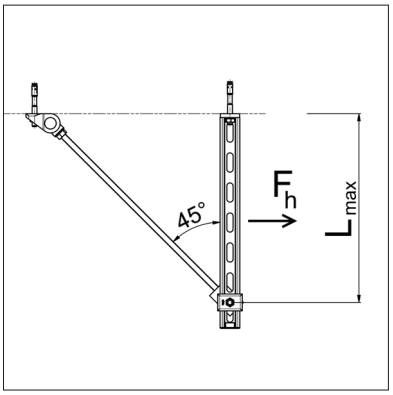
Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation.

Parts list

				
Item 1: AK 41	**Item 2: UG**	**Item 3: GST**	**Item 4: MW S**	**Item 5: HK 41**
Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
from 41/41 - 820 (149268)	M12 (158075)	M12 (143192)	60/40/90° (115399)	41/10 (178247)
to 41/62 - 1010 (113300)	M16 (158084)	M16 (110817)	60/40/90° (115399)	41/10 (178247)

Max. recommended load under seismic impact



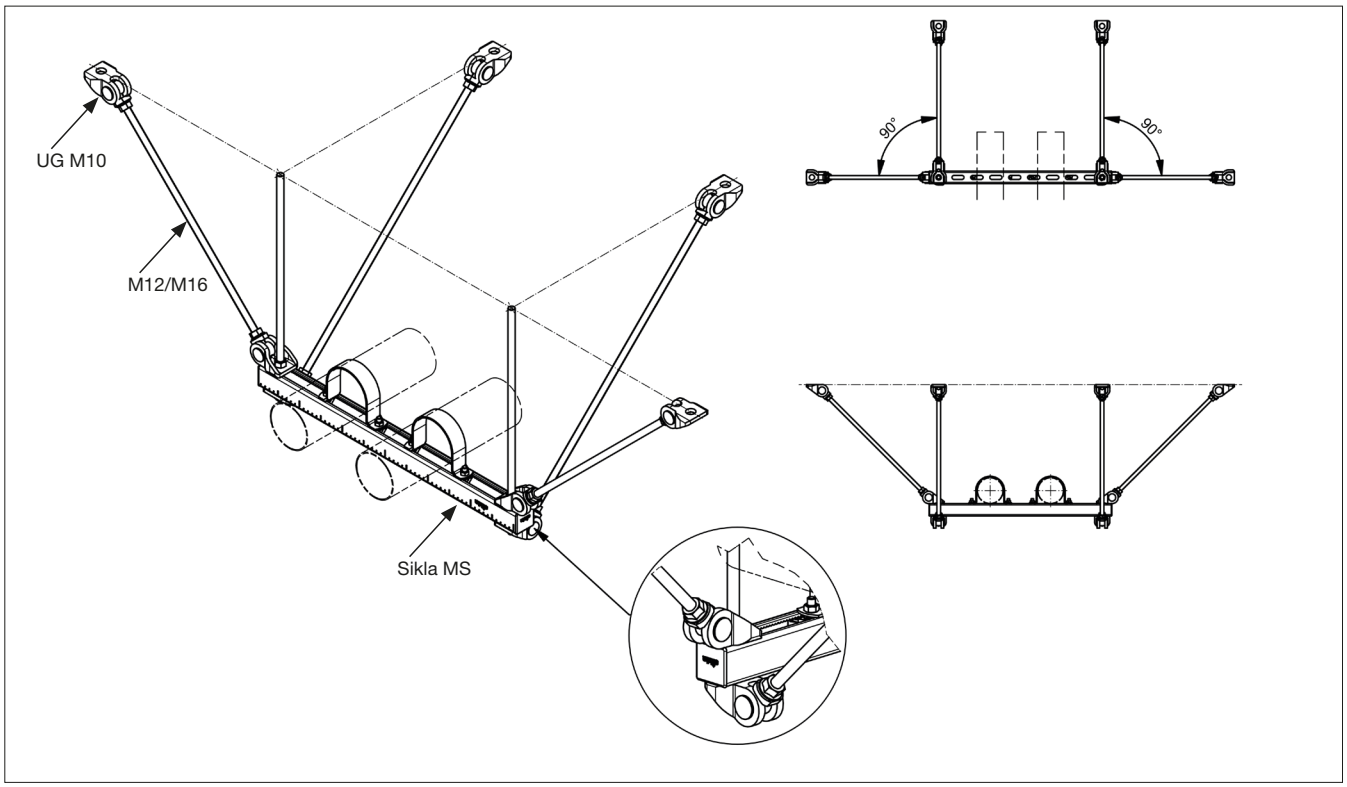
Permissible load for connection to concrete	
L_{max} [m]	Cracked concrete C20/25
	$F_{RD,S,eq}$ (F_{h}) [kN] [2]
0,4	8,60
0,6	7,97
0,8	5,98

1) Values valid for cantilever bracket AK ≥41/41/2.0 with strut M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the AK (channel) must be observed. Contact Sikla Application Technician for further assembly types.

2) The attachment to the building structure must be verified separately.

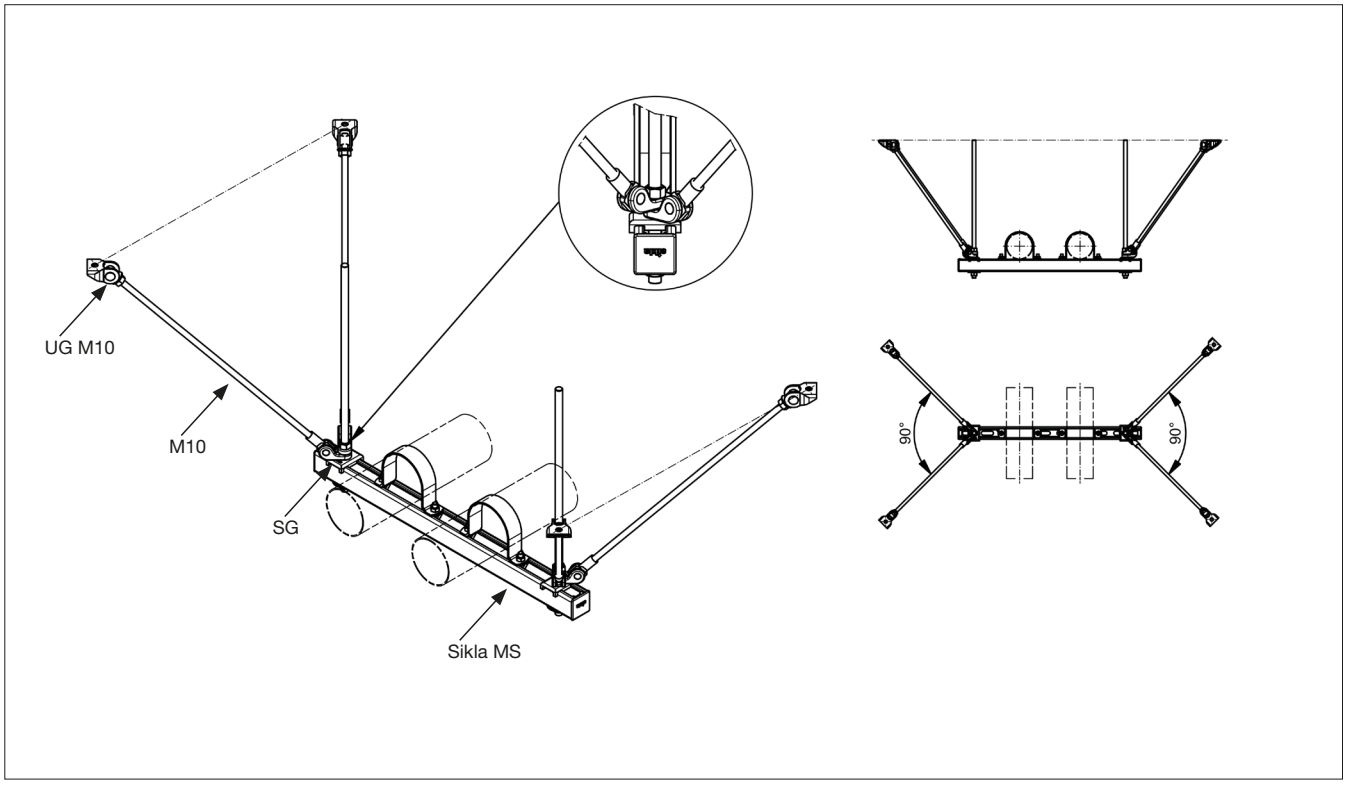
Alternative solutions

1. Channel line: SC-T2LoT2La



*For load information contact Sikla Application Technician

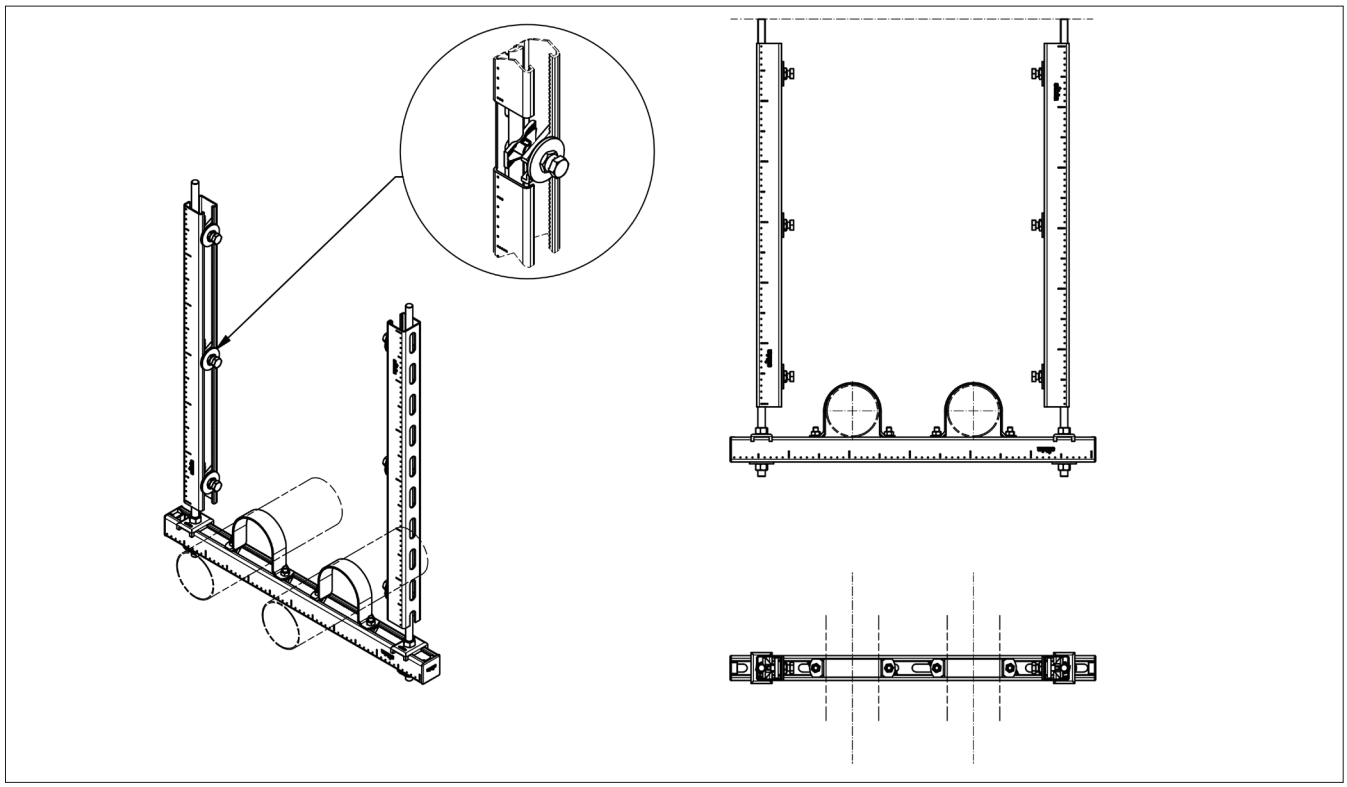
2. Channel line: SC-T4LoLa 45°



*For load information contact Sikla Application Technician

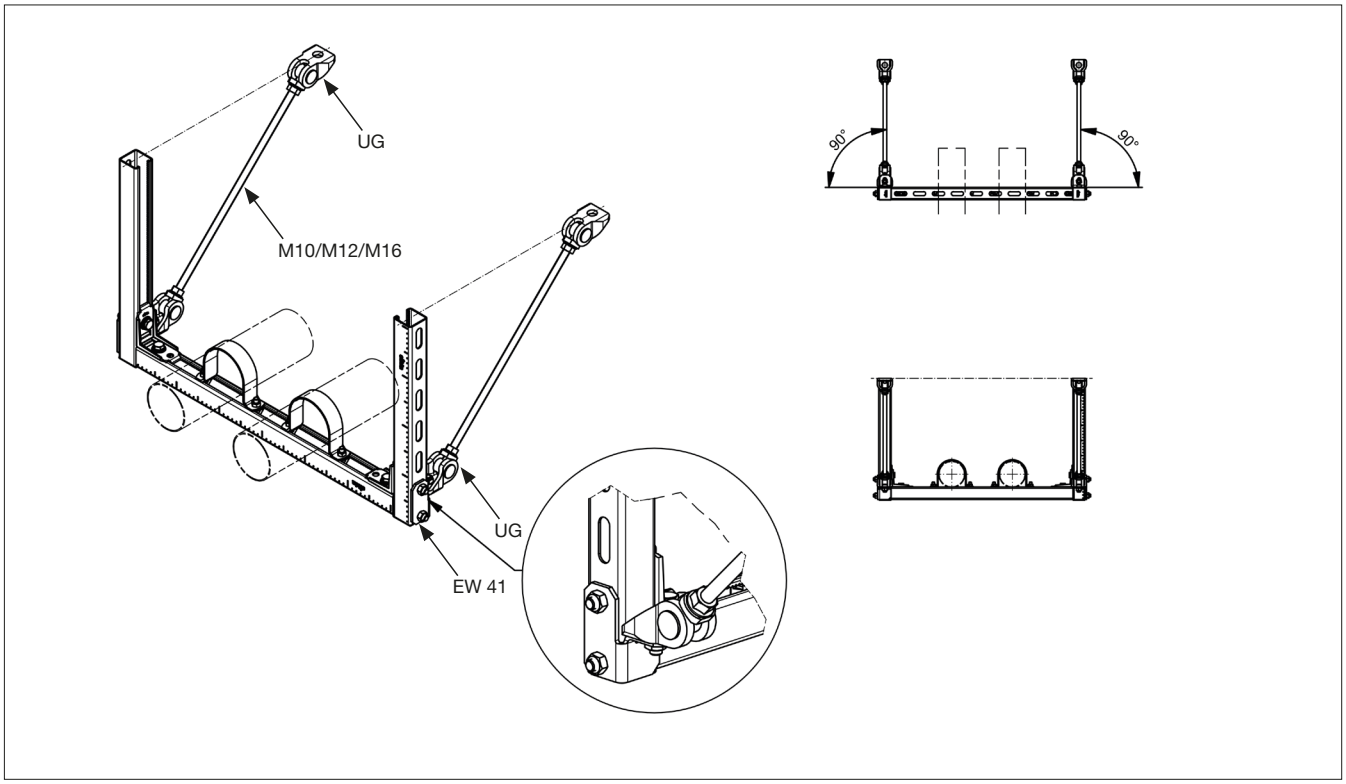
10/2019

3. Channel line: SCC-T2Lo RST (rod stiffener)



*For further information contact Sikla Application Technician

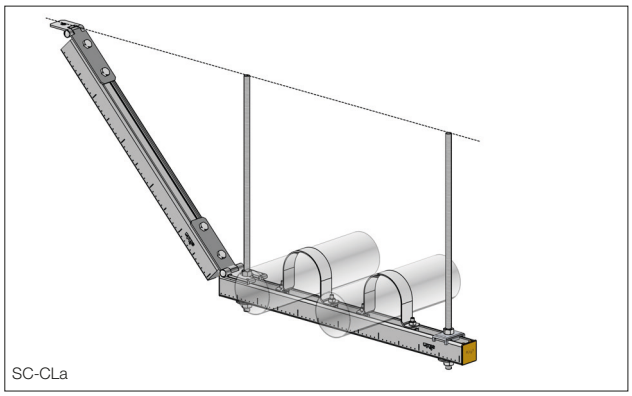
4. Channel line: SCC-T2Lo EW (corner bracket)

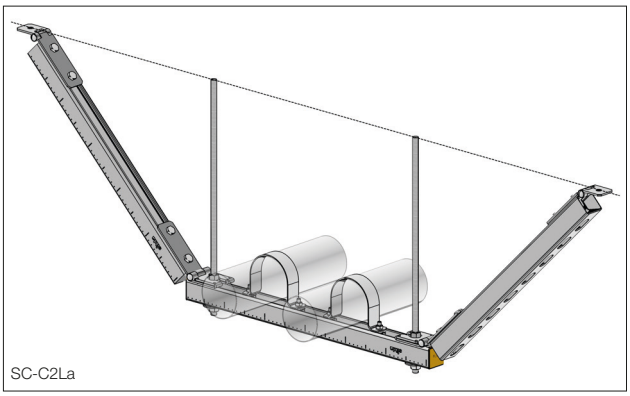


*For load information contact Sikla Application Technician

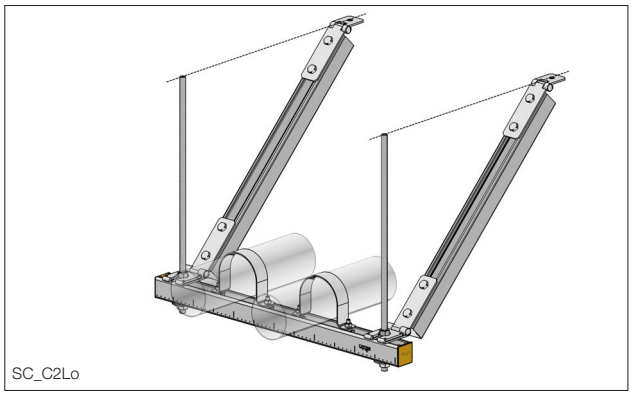
Assembly - Channel /MS strut

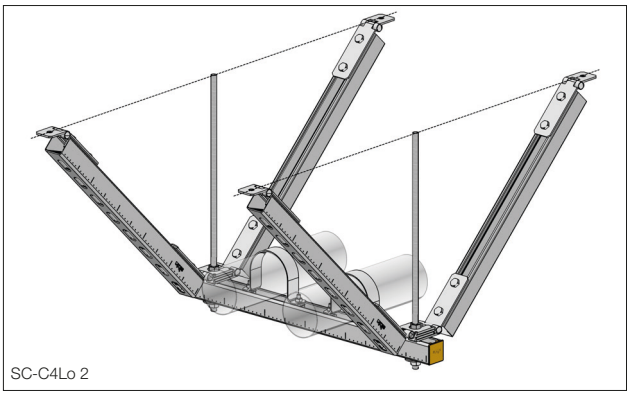
SC - Lateral bracing


SC-CLa

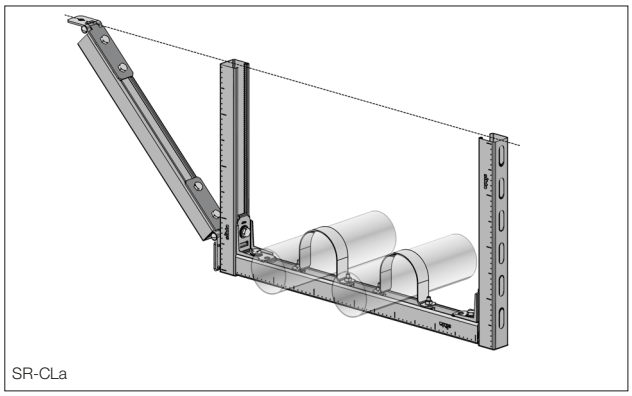

SC-C2La

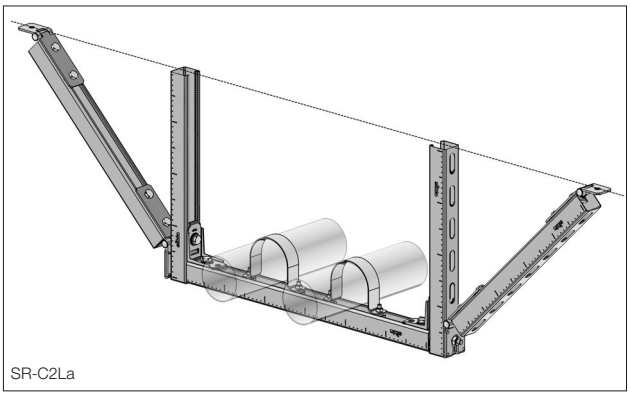
SC - Longitudinal bracing


SC_C2Lo

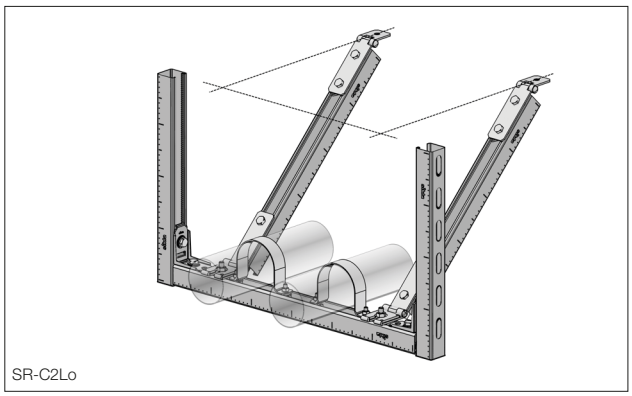

SC-C4Lo 2

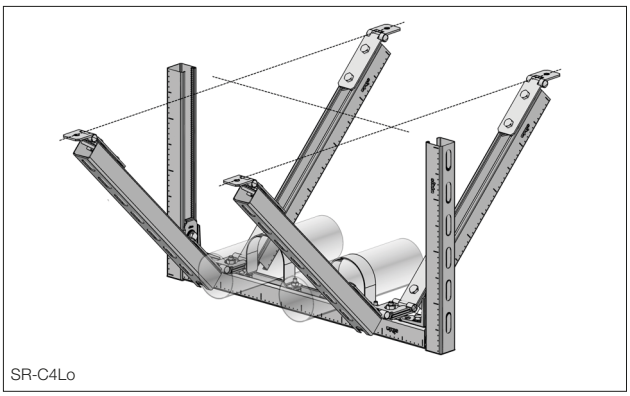
SR - Lateral bracing


SR-CLa


SR-C2La

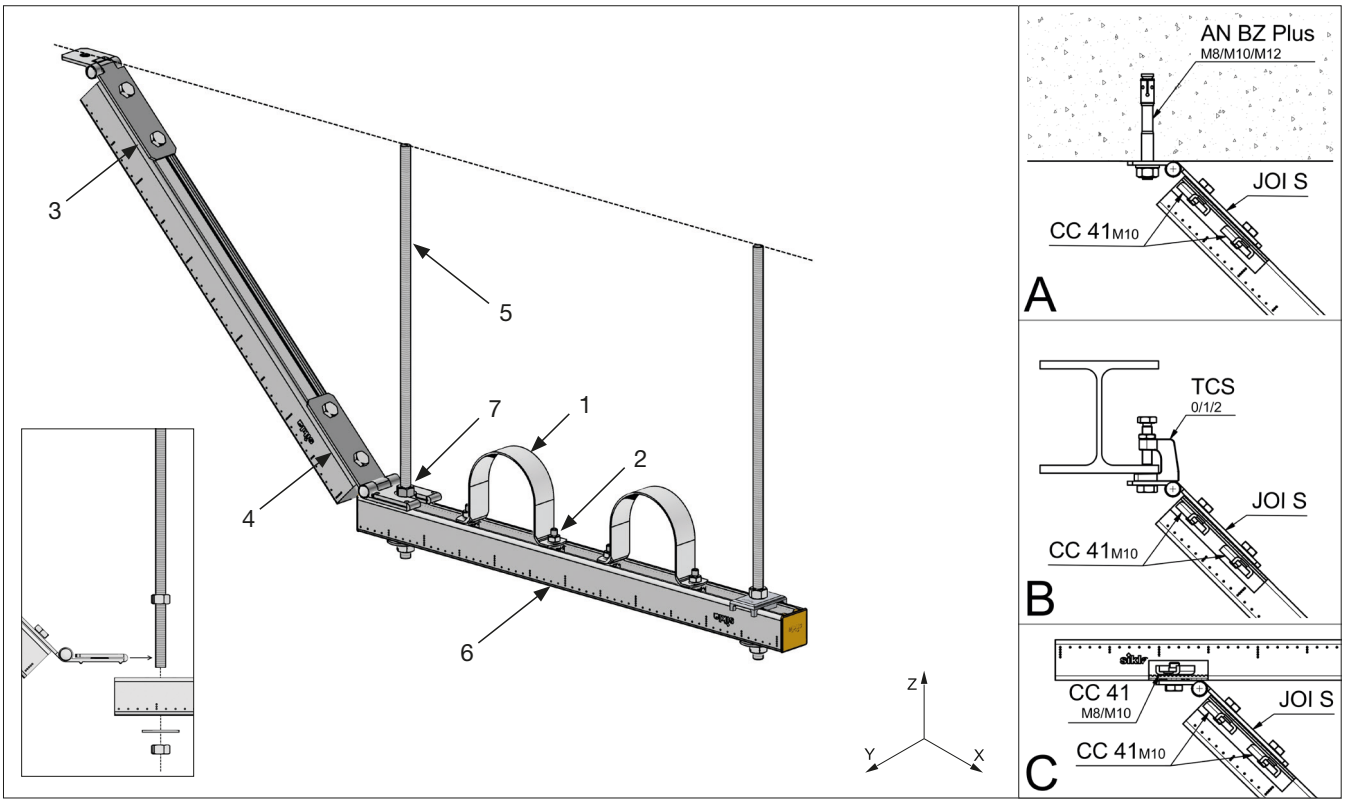
SR - Longitudinal bracing


SR-C2Lo


SR-C4Lo

10/2019

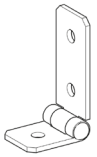
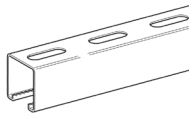
Channel line: SC-CLa



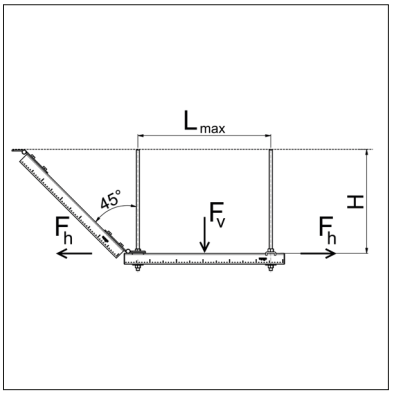
Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

Parts list

						
Item 1: RUC	**Item 2: TBO HZ 41**	**Item 3: JOI S**	**Item 4: JOI R**	**Item 5: GST**	**Item 6: MS 41**	**Item 7: NT**
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	S (116577)	23 (116809)	M12 (143192)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	S (116577)	23 (116809)	M16 (110817)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



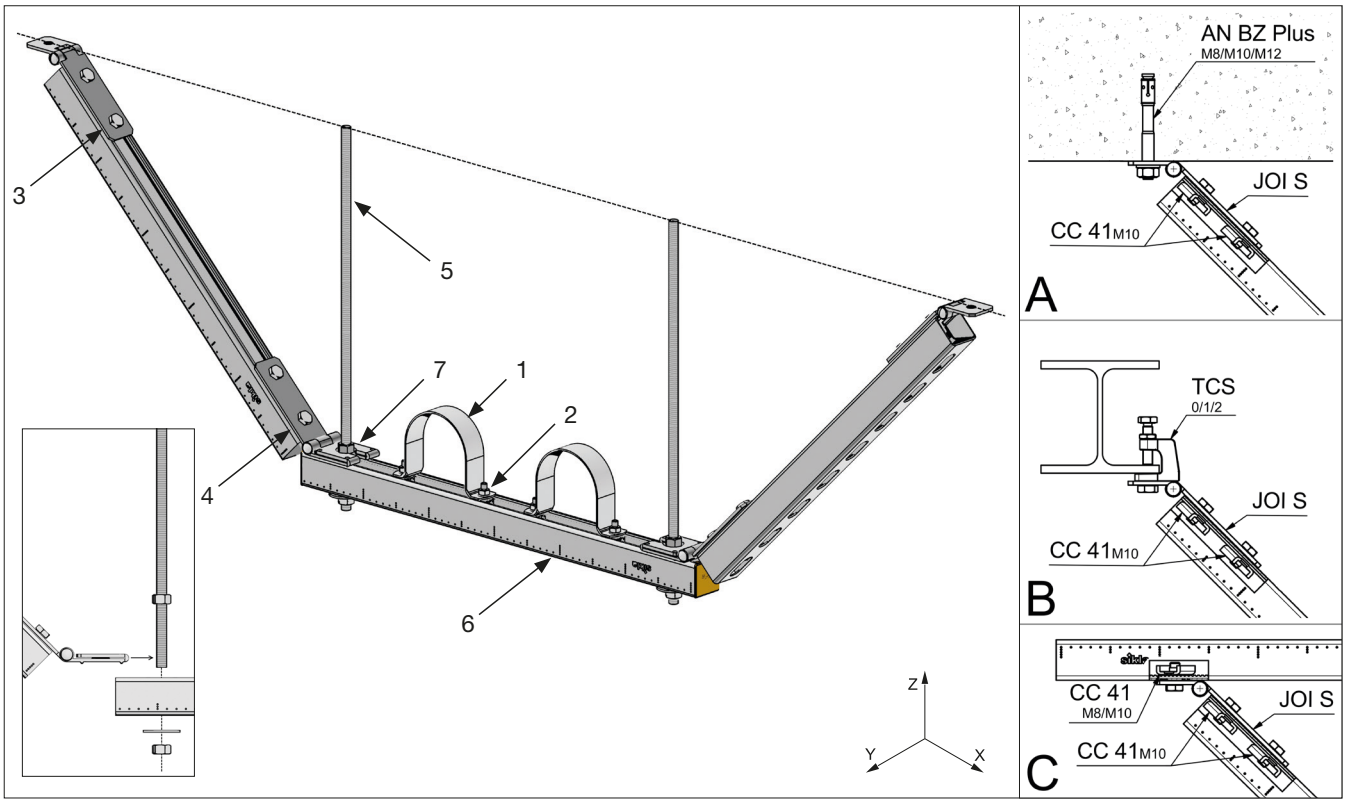
Permissible load according to type of assembly [1]

H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2 < H < 0,6	3,44	2,50	2,00
0,6 < H < 0,8	1,93	1,93	1,93

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2,0	for MS 41/41/2,0	for MS 41-75/75/3,0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

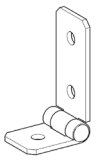
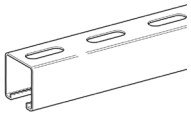
(1) Values valid for channels ≥ 41/41/2.0 with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

Channel line: SC-C2La

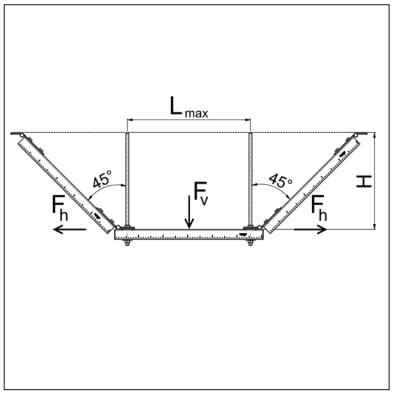


Application
Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

Parts list

						
Item 1: RUC	**Item 2: TBO HZ 41**	**Item 3: JOI S**	**Item 4: JOI R**	**Item 5: GST**	**Item 6: MS 41**	**Item 7: NT**
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	S (116577)	23 (116809)	M12 (143192)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	S (116577)	23 (116809)	M16 (110817)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



Permissible load according to type of assembly [1]

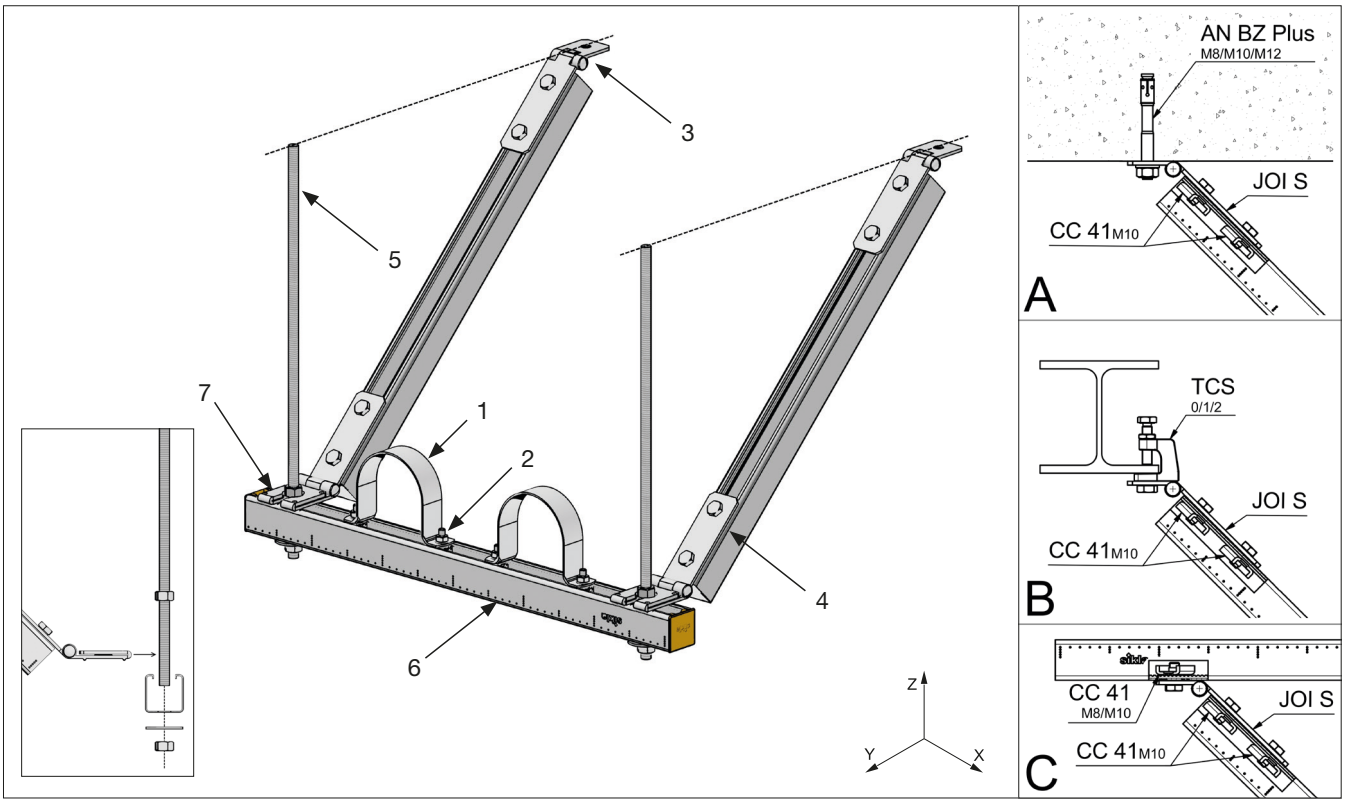
H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2 < H < 0,6	6,88	5,00	4,00
0,6 < H < 0,8	3,86	3,86	3,86

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2,0	for MS 41/41/2,0	for MS 41-75/75/3,0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channels ≥ 41/41/2.0 with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

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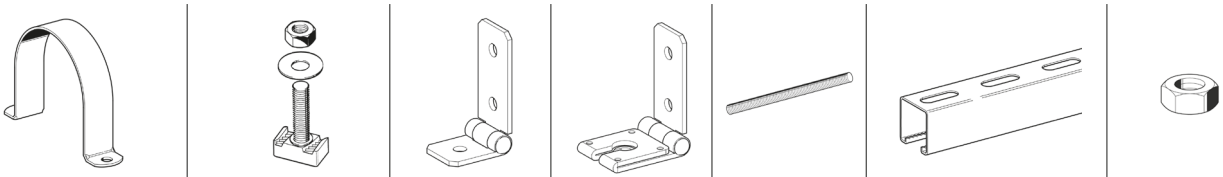
Channel line: SC-C2Lo



Application

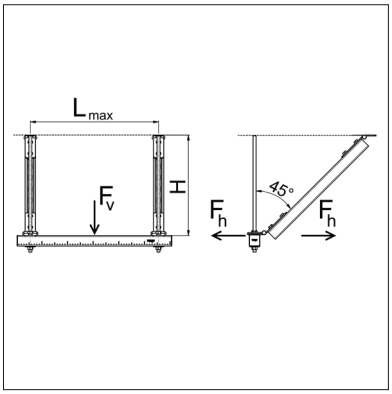
Assembly for absorbing longitudinally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

Parts list



Item 1: RUC	Item 2: TBO HZ 41	Item 3: JOI S	Item 4: JOI R	Item 5: GST	Item 6: MS 41	Item 7: NT
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	S (116577)	23 (116809)	M12 (143192)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	S (116577)	23 (116809)	M16 (110817)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



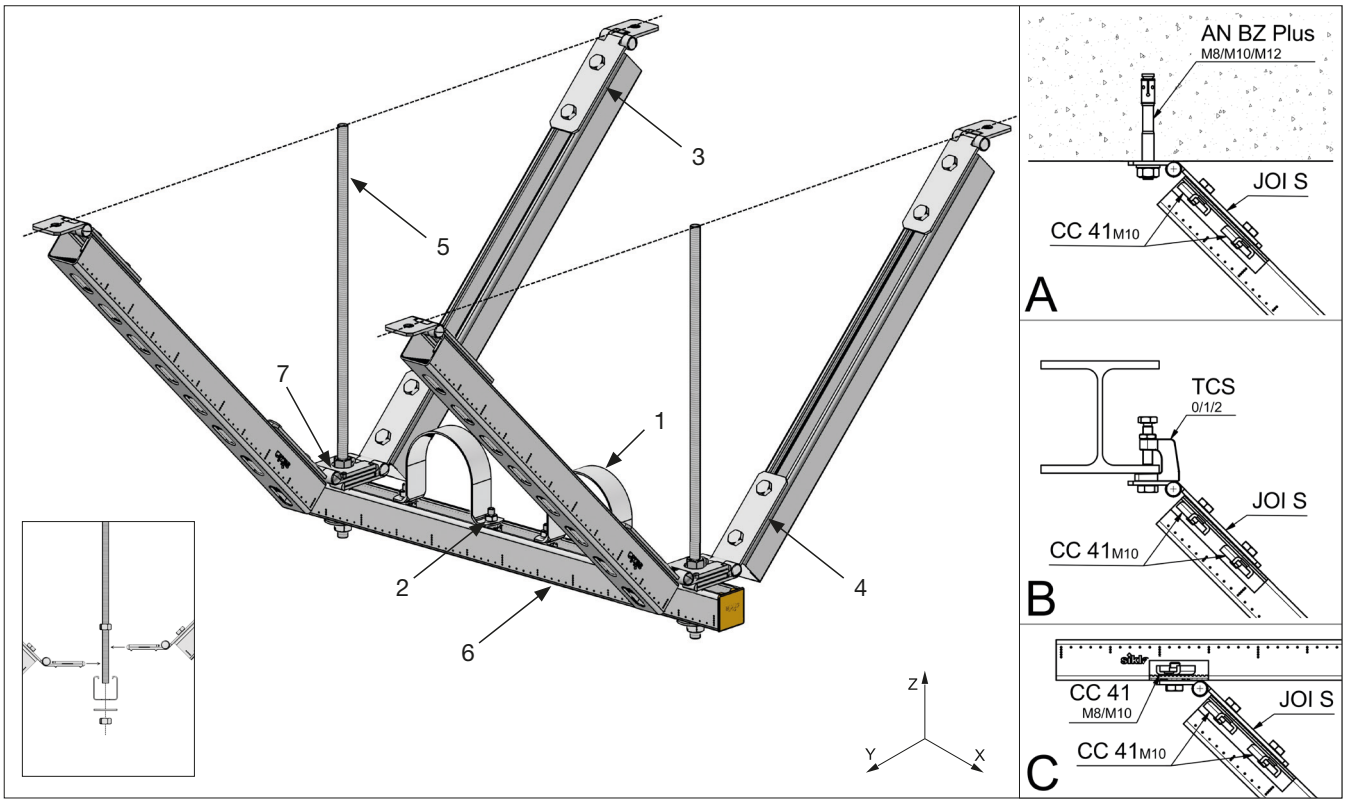
Permissible load according to type of assembly [1]

H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2] Concrete / Steel beams / MS 41 L_{max} [m] 0,5	1,0	1,5	2,0
0,4	4,00	4,00	3,19	2,39
0,6	4,00	4,00	3,19	2,39
0,8	3,86	3,86	3,19	2,39

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2] for MS 41/21/2,0	for MS 41/41/2,0	for MS 41-75/75/3,0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channels ≥ 41/41/2.0 with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

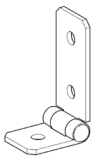
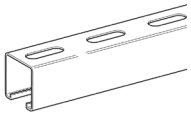
Channel line: SC-C4Lo 2



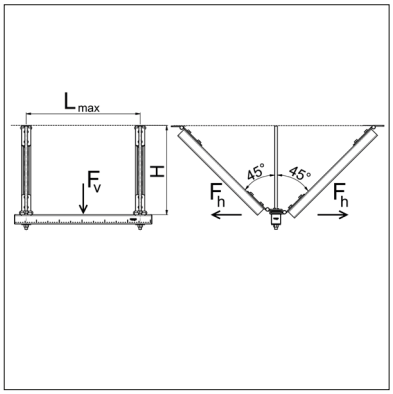
Application

Assembly for absorbing longitudinally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

Parts list

						
Item 1: RUC	**Item 2: TBO HZ 41**	**Item 3: JOI S**	**Item 4: JOI R**	**Item 5: GST**	**Item 6: MS 41**	**Item 7: NT**
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Dimension	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	S (116577)	23 (116809)	M12 (143192)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	S (116577)	23 (116809)	M16 (110817)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



Permissible load according to type of assembly [1]

H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2] Concrete / Steel beams / MS 41 L_{max} [m]			
	0,5	1,0	1,5	2,0
0,4	4,00	4,00	3,19	2,39
0,6	4,00	4,00	3,19	2,39
0,8	3,86	3,86	3,19	2,39

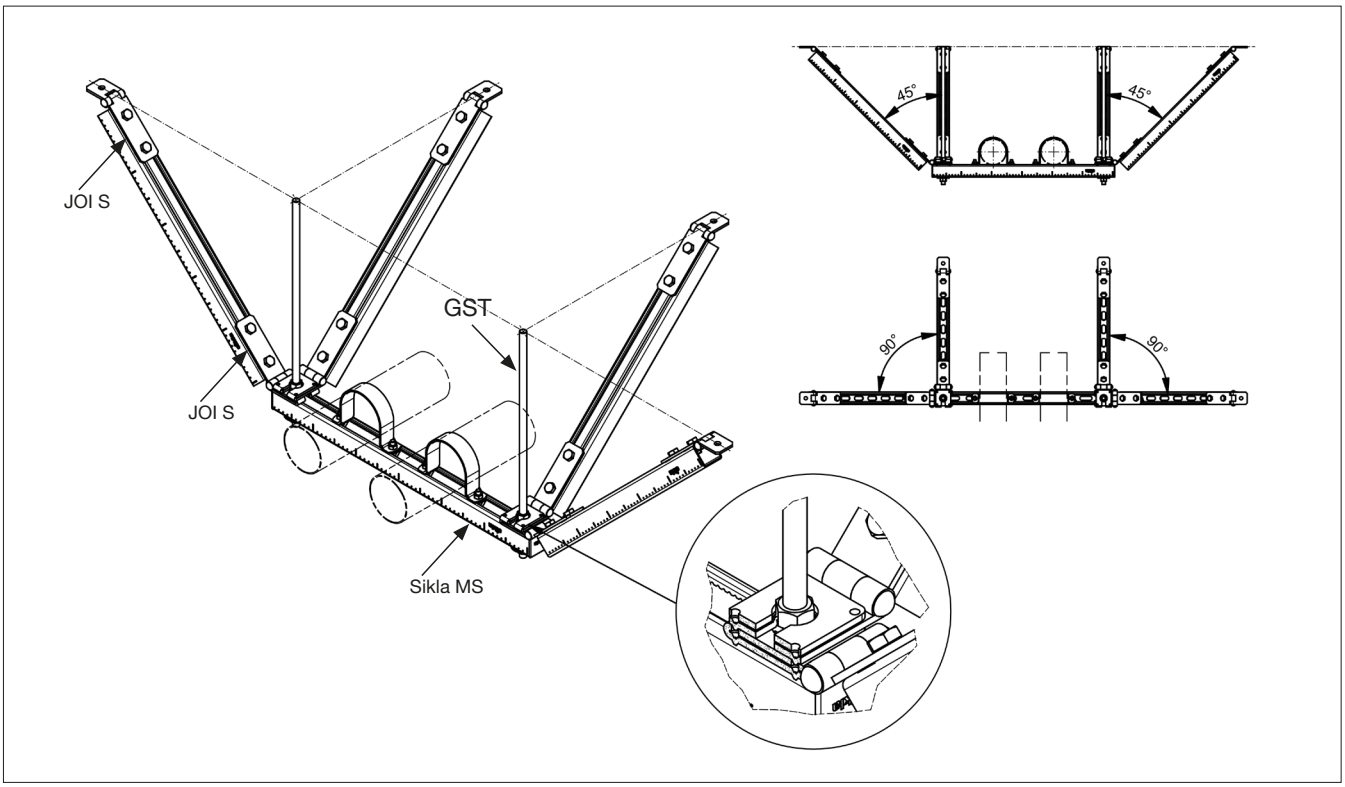
L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2.0	for MS 41/41/2.0	for MS 41-75/75/3.0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channels ≥ 41/41/2.0 with threaded rods ≥ M12, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

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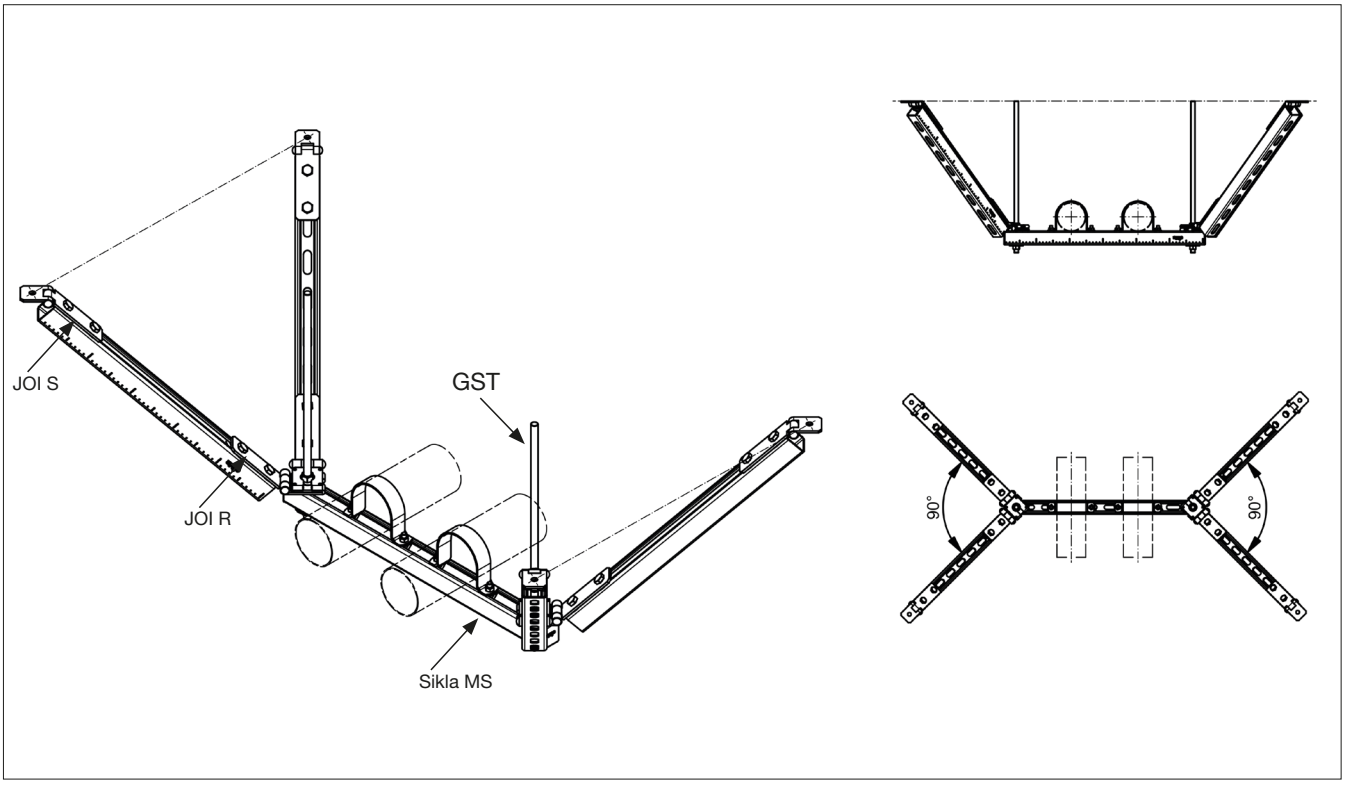
Alternative solutions

1. Channel line: SC-C2LoT2La



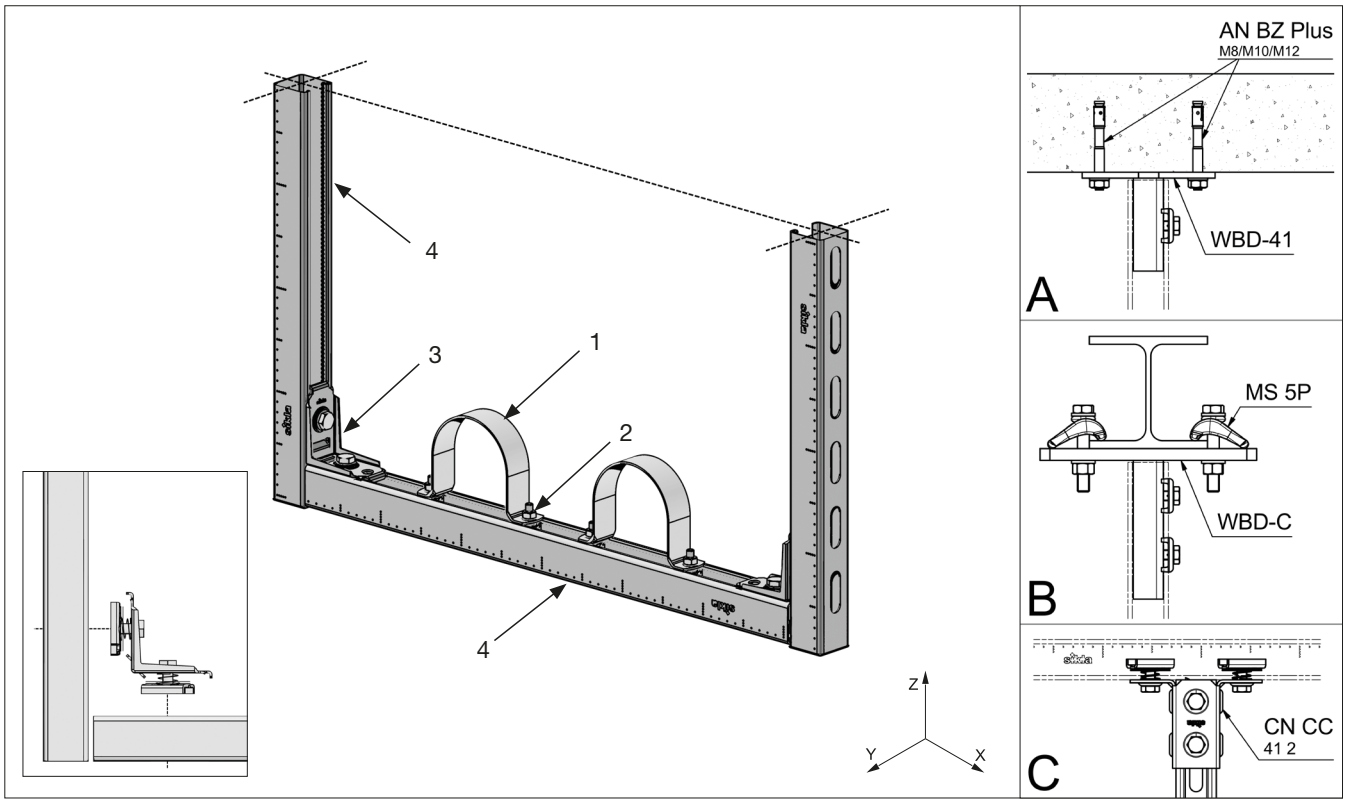
*For load information contact Sikla Application Technician

2. Channel line: SC-C4LoLa 45°



*For load information contact Sikla Application Technician

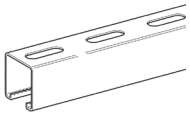
SR channel line



Application
Channel fixed with two vertical channels.

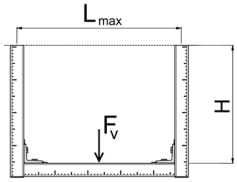
Parts list



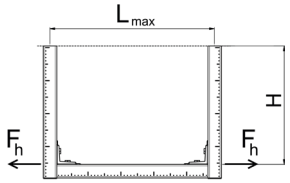
Item 1: RUC	Item 2: TBO HZ 41	Item 3: CC 41-90° Stabil	Item 4: MS 41
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	CC 41-90° Stabil (191675)	from: 41/21/2,0 (193686)
5“ (159119) - 12“ (159155)	M12x35 (152185)	CC 41-90° Stabil (191675)	to: 41-75/75/3,0 (173999)

Max. recommended load under seismic impact

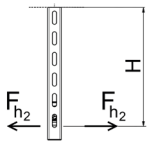


L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] 2)		
	for MS 41/21/2,0	for MS 41/41/2,0	for MS 41-75/75/3,0
0,5	2,15	6,37	6,64
1,0	1,07	3,18	6,64
1,5	0,72	2,12	6,64
2,0	0,54	1,59	6,64

Permissible load according to type of assembly 1)



H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] 2)		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	6,28	6,28	6,00
0,4	3,14	3,14	3,14
0,6	2,09	2,09	2,09
0,8	1,57	1,57	1,57

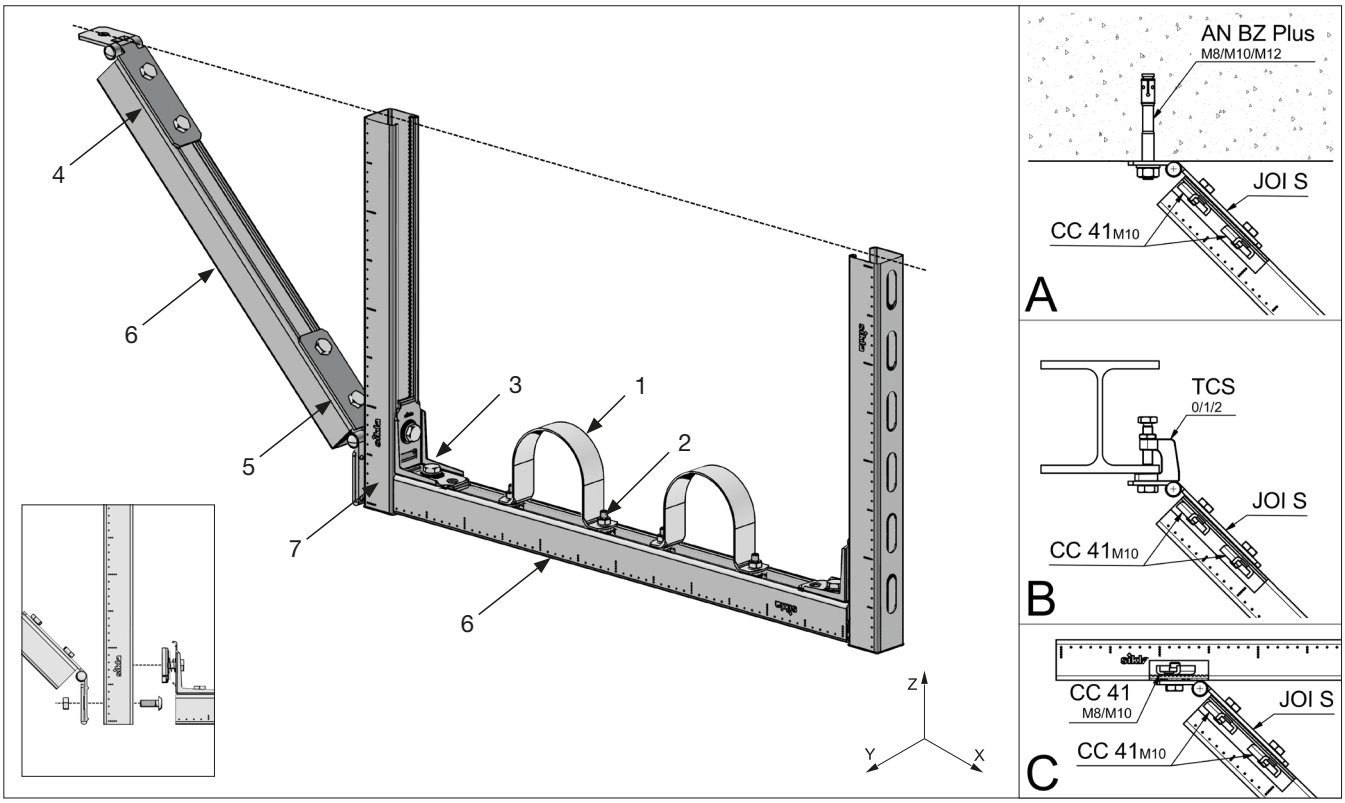


H_{max} [m]	$F_{RD,S,eq}$ (F_{h2}) [kN] 2)		
	A [concrete]	B [steel beams]	C [MS 41]
0,2	2,00	2,00	0,90
0,4	1,00	1,00	0,45
0,6	0,67	0,67	0,30
0,8	0,50	0,50	0,23

(1) Values valid for channel with vert. MS from 41/41/20, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) Max. load for channel and threaded rods. The attachment to the building structure must be verified separately.

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SR-CLa channel line

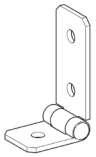
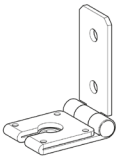
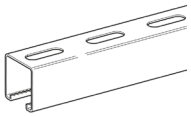
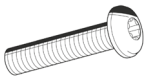


Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

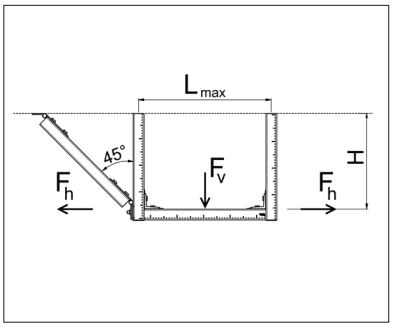
Parts list



Item 1: RUC	Item 2: TBO HZ 41	Item 3: CC 41-90° Stabil	Item 4: JOI S	Item 5: JOI R	Item 6: MS 41	Item 7: FLA
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	from: 41/21/2,0 (193686)	M10x25 (198353)
5“ (159119) - 12“ (159155)	M12x35 (152185)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	to: 41-75/75/3,0 (173999)	M10x25 (198353)

Max. recommended load under seismic impact



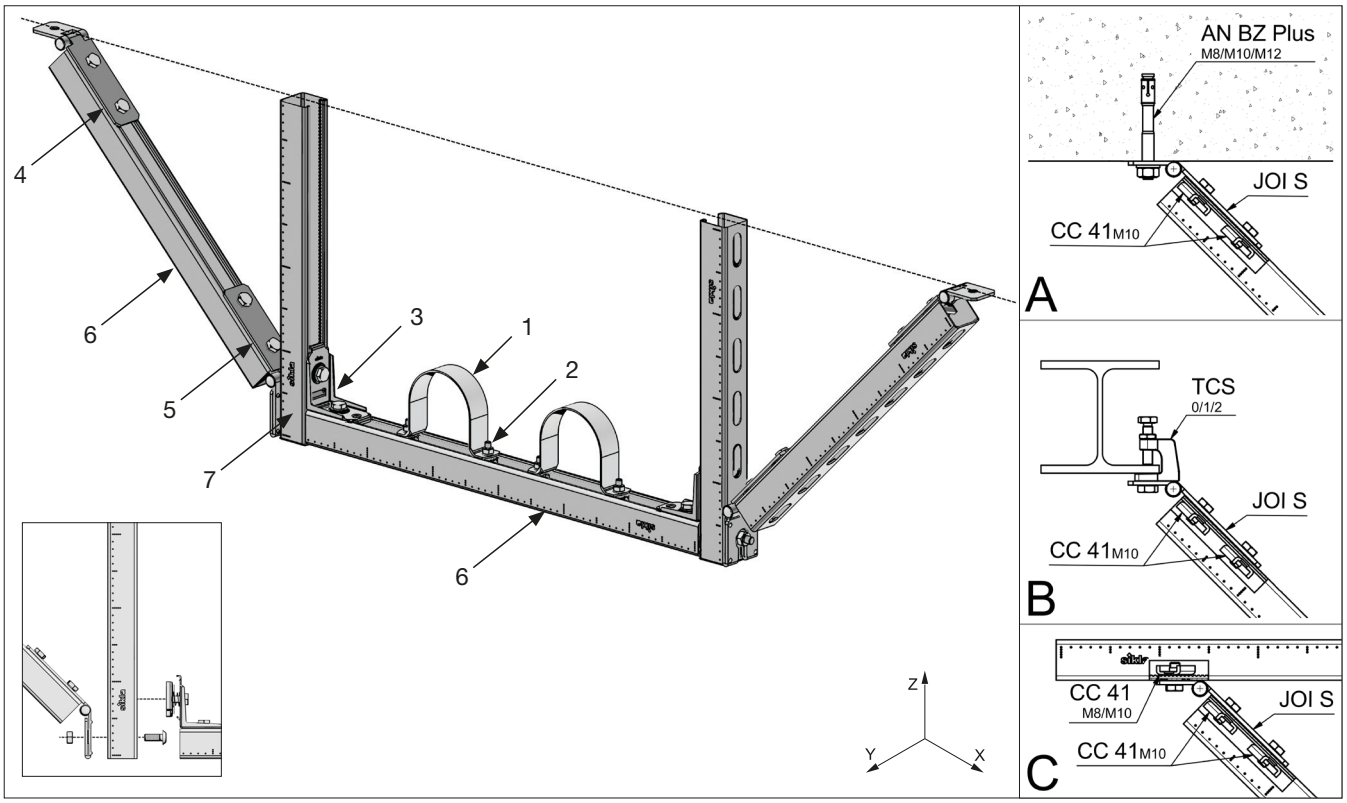
Permissible load according to type of assembly [1]

H_{max} [m]	$F_{RD,S,eq}$ (F_h) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2 < H < 0,8	4,23	2,50	2,00

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2,0	for MS 41/41/2,0	for MS 41-75/75/3,0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channel with vert. MS from 41/41/2.0, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

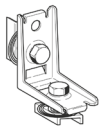
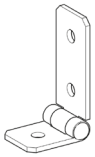
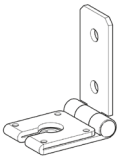
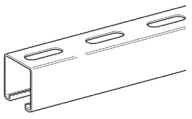
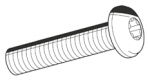
SR-C2La channel line



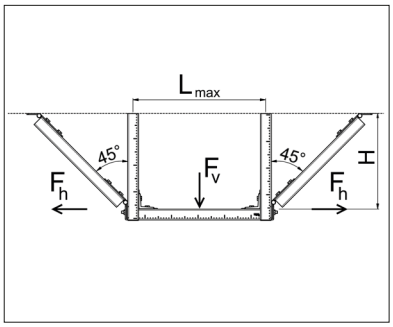
Application

Assembly for absorbing laterally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

Parts list

						
Item 1: RUC	**Item 2: TBO HZ 41**	**Item 3: CC 41-90° Stabil**	**Item4: JOI S**	**Item 5: JOI R**	**Item 6: MS 41**	**Item7: FLA**
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	from: 41/21/2,0 (193686)	M10x25 (198353)
5“ (159119) - 12“ (159155)	M12x35 (152185)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	to: 41-75/75/3,0 (173999)	M10x25 (198353)

Max. recommended load under seismic impact



Permissible load according to type of assembly [1]

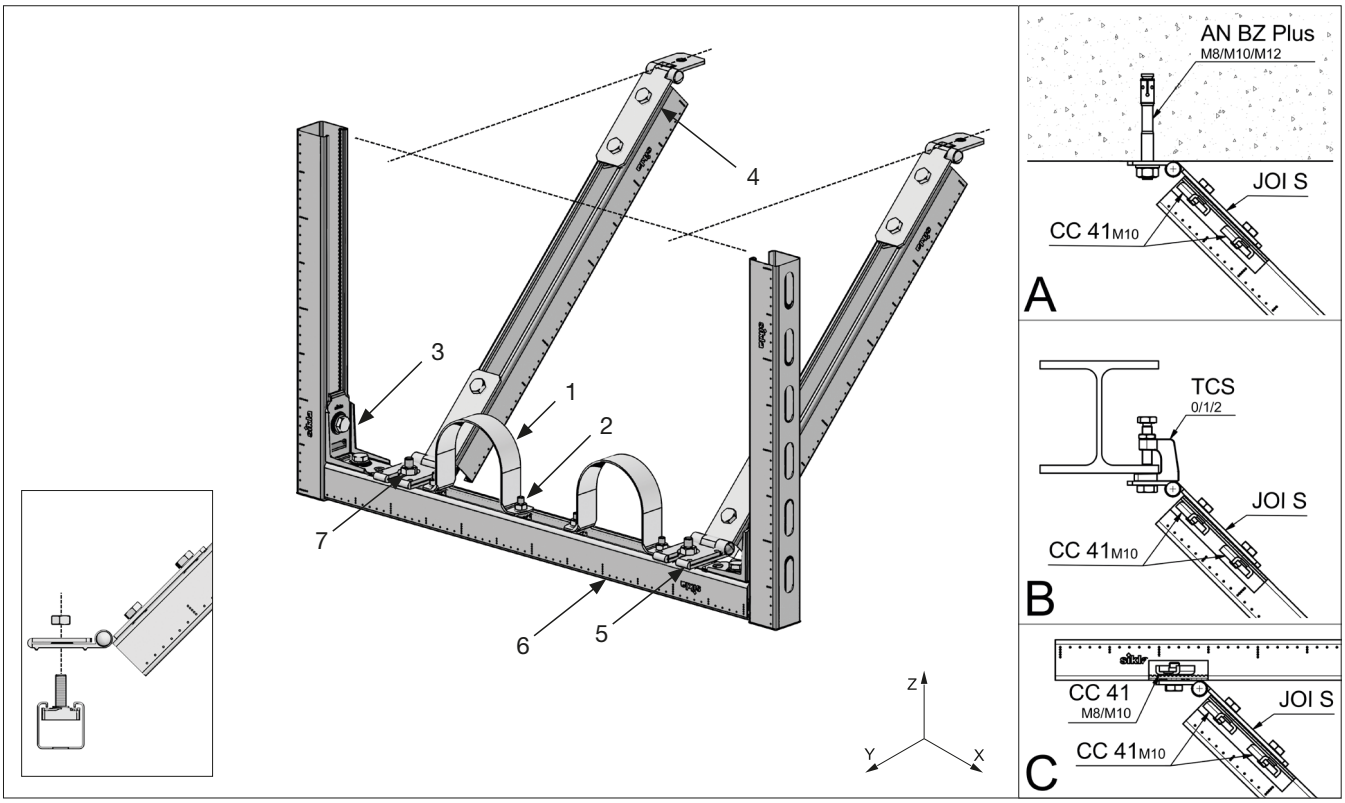
H_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	A [concrete]	B [steel beams]	C [MS 41]
0,2 < H < 0,8	8,46	5,00	4,00

L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
	for MS 41/21/2,0	for MS 41/41/2,0	for MS 41-75/75/3,0
0,5	2,15	6,37	27,01
1,0	1,07	3,18	13,51
1,5	0,72	2,12	9,00
2,0	0,54	1,59	6,75

(1) Values valid for channel with vert. MS from 41/41/2.0, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

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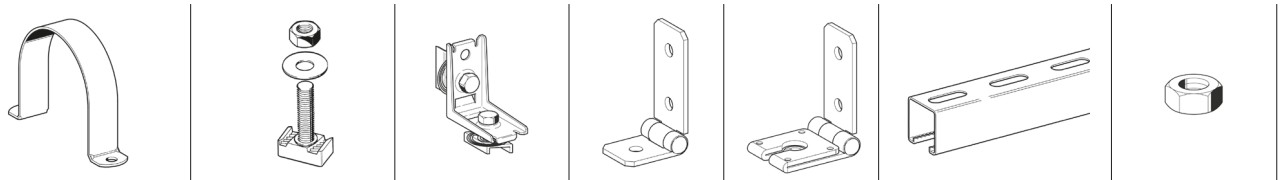
SR-C2Lo channel line



Application

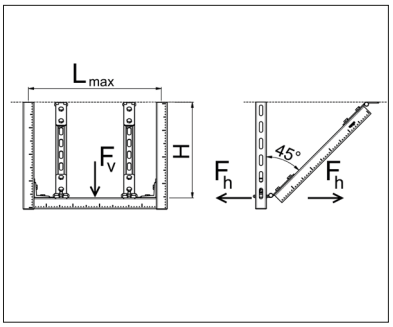
Assembly for absorbing longitudinally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

Parts list



Item 1: RUC	Item 2: TBO HZ 41	Item 3: CC 41-90° Stabil	Item 4: JOI S	Item 5: JOI R	Item 6: MS 41	Item 7: NT
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



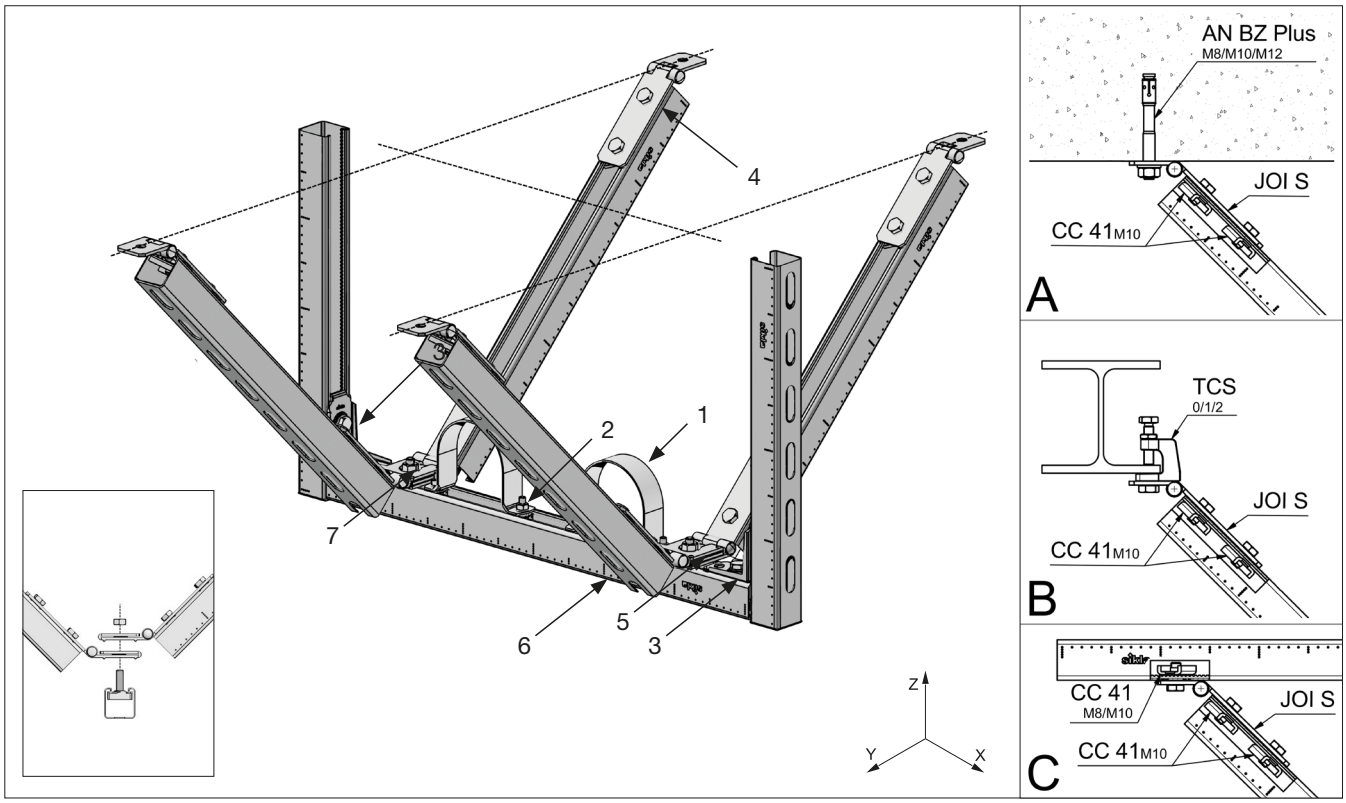
Permissible load according to type of assembly [1]

Concrete / Steel beams / MS 41		L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
L_{max} [m]	$F_{RD,S,eq}$ (F_h) [2] [kN]		for MS 41/21/2,0	for MS 41/21/2,0	for MS 41-75/75/3,0
0,5	4,00	0,5	2,15	6,37	27,01
1,0	4,00	1,0	1,07	3,18	13,51
1,5	3,19	1,5	0,72	2,12	9,00
2,0	2,39	2,0	0,54	1,59	6,75

*H_{max} [m] = 0,2 < H < 0,8

(1) Values valid for channel with vert. MS from 41/41/2.0, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

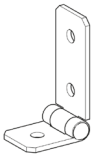
SR-C4Lo channel line

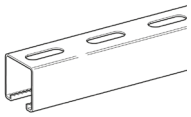


Application
Assembly for absorbing longitudinally occurring impacts. Flexible angle adjustment and radial alignment according to the given installation situation. Possibility of connection after assembly.

Parts list

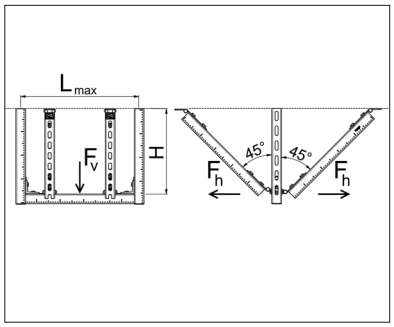





Item 1: RUC	Item 2: TBO HZ 41	Item 3: CC 41-90° Stabil	Item 4: JOI S	Item 5: JOI R	Item 6: MS 41	Item 7: NT
Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)	Type (Part no.)
3/8“ (159012) - 4“ (159100)	M10x35 (152051)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	from: 41/21/2,0 (193686)	M12 (114228)
5“ (159119) - 12“ (159155)	M12x35 (152185)	CC 41-90° Stabil (191675)	S (116577)	23 (116809)	to: 41-75/75/3,0 (173999)	M16 (114237)

Max. recommended load under seismic impact



Permissible load according to type of assembly [1]

Concrete / Steel beams / MS 41		L_{max} [m]	$F_{RD,S,eq}$ (F_v) [kN] [2]		
L_{max} [m]	$F_{RD,S,eq}$ (F_h) [2] [kN]		for MS 41/21/2,0	for MS 41/41/2,0	for MS 41-75/75/3,0
0,5	8,00	0,5	2,15	6,37	27,01
1,0	8,00	1,0	1,07	3,18	13,51
1,5	3,19	1,5	0,72	2,12	9,00
2,0	2,39	2,0	0,54	1,59	6,75

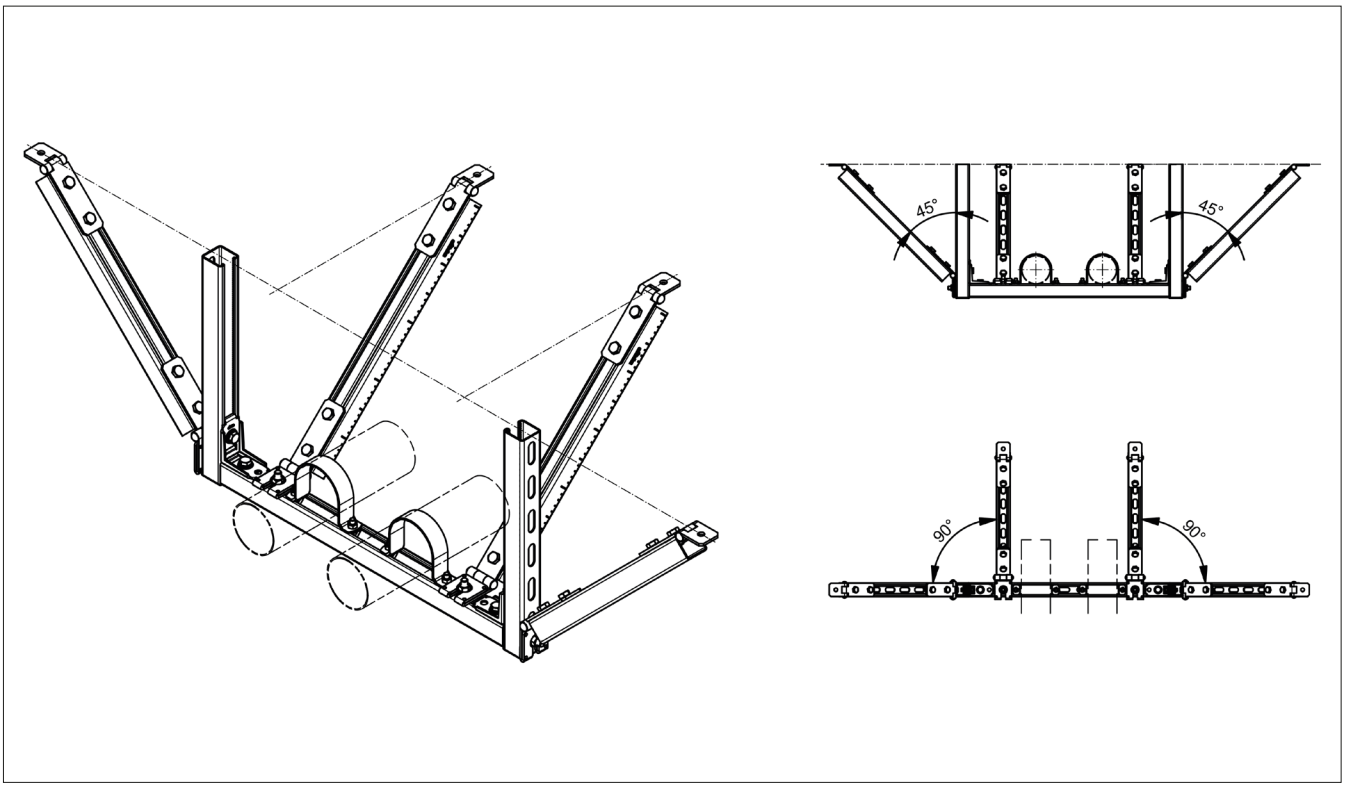
*H_{max} [m] = 0,2 < H < 0,8

(1) Values valid for channel with vert. MS from 41/41/2.0, under seismic impact. The maximum permissible load capacity as well as the permissible torsion moment of the channel must be observed. Please contact Sikla application engineering for further assembly types.
(2) The attachment to the building structure must be verified separately.

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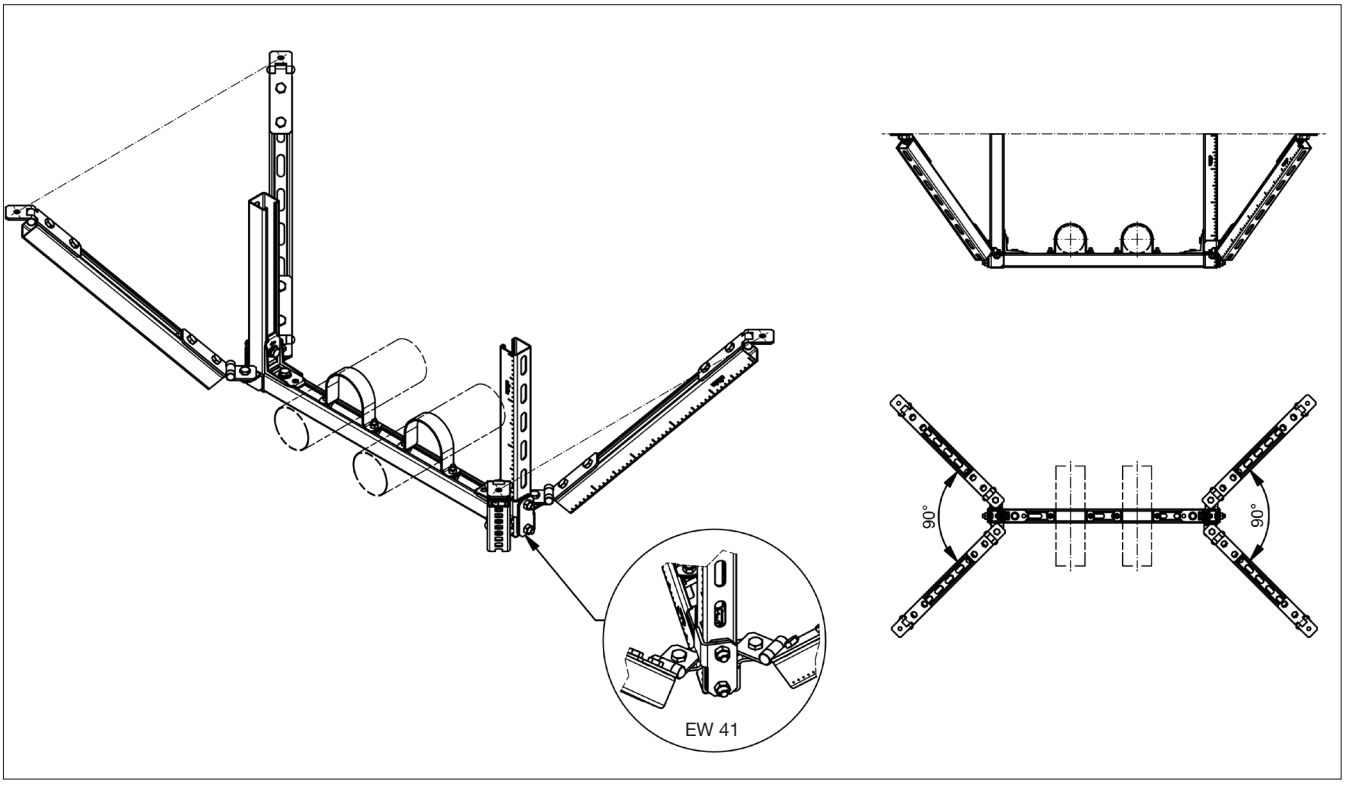
Alternative solutions

1. Channel line: SR-C2LoT2La



*For load information contact Sikla Application Technician

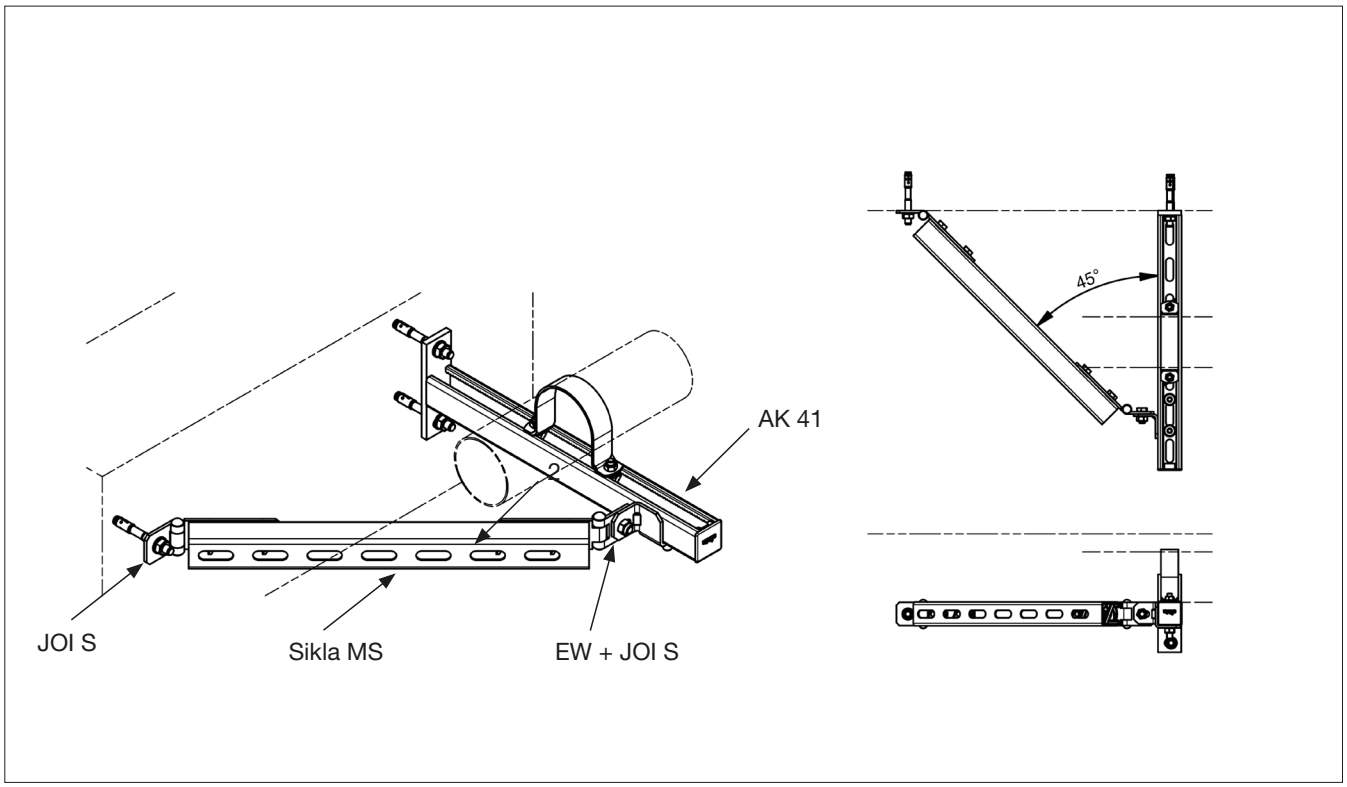
2. Channel line: SR-C4LoLa 45°



*For load information contact Sikla Application Technician

Alternative solutions

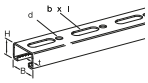
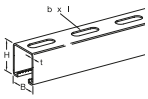
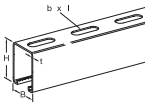
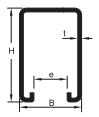
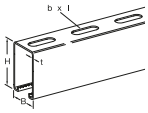
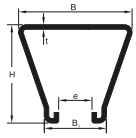
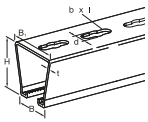
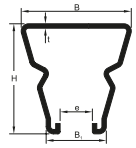
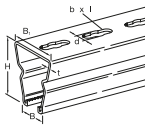
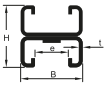
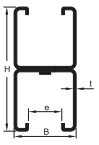
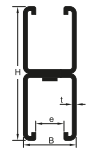
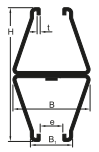
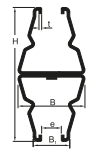
3. Cantilever bracket channel: SR-TLoTLa AK



*For load information contact Sikla Application Technician

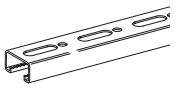
Components - Technical information

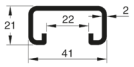
MS channels

	Type [mm]	Dimensions B [mm]	H [mm]	t [mm]	e [mm]	Slot pattern	b [mm]	l [mm]	d [mm]
	41/21/2,0	41	21	2	22		13	40	-
	41/31/2,0	41	31	2	22		13	40	-
	41/41/2,0	41	41	2	22				
	41/41/2,5	41	41	2,5	22				
	41/45/2,5	41	45	2,5	22		13	40	-
	41/52/2,5	41	52	2,5	22				
	41/62/2,5	41	62	2,5	22		13	40	-
	41-75/65/3,0	41	65	3	22		13	40	17
	41-75/75/3,0	41	75	3	22		13	40	17
	41/21/2,0 D	41	41	2	22	see single channels			
	41/41/2,0 D	41	82	2	22				
	41/41/2,5 D	41	82	2	22				
	41/45/2,5 D	41	90	2,5	22				
	41/52/2,5 D	41	104	2,5	22				
	41/62/2,5 D	41	124	2,5	22				
	41-75/65/3,0 D	41	130	3	22				
	41-75/75/3,0 D	41	150	3	22				

Channel MS 41- Seismic Loads

MS 41/21/2.0

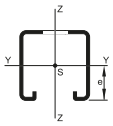




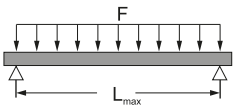
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
0,92	4,33	0,82	2,11	1,60	0,76	1,65	1,12

*All values refer to slotted channels.



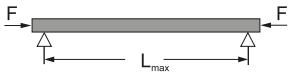
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	4,7	1.061	3	0,12
610	24	3,5	796	5	0,21
914	36	2,4	530	12	0,48
1.219	48	1,8	398	22	0,85

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

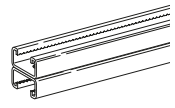
[1) 3)] Max. allowable buckling load under seismic conditions

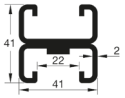


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	12,7	2.863	24,8	5.571	29,5	6.623
610	24	8,4	1.893	20,0	4.495	25,8	5.800
914	36	4,3	973	12,7	2.863	19,1	4.298
1.219	48	2,6	586	8,4	1.893	13,9	3.129

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

MS 41/21/2.0 D

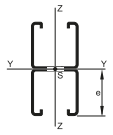




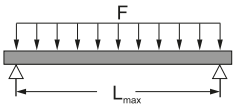
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
4,94	8,65	2,35	4,22	3,21	1,24	1,64	2,10

*All values refer to slotted channels..



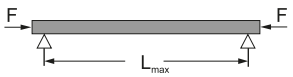
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	13,5	3.030	2	0,06
610	24	10,1	2.272	3	0,11
914	36	6,7	1.515	6	0,25
1219	48	5,1	1.136	11	0,45
1524	60	4,0	909	18	0,71
1829	72	3,4	757	26	1,02
2438	96	2,5	568	46	1,81

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	43,1	9.687	61,8	13.896	67,9	15.258
610	24	32,7	7.362	55,3	12.437	63,1	14.193
914	36	19,3	4.328	43,1	9.687	54,0	12.150
1.219	48	12,3	2.755	32,7	7.362	45,4	10.212
1.524	49	8,4	1.890	24,9	5.599	37,6	8.457
1.829	50	6,1	1.373	19,3	4.328	31,0	6.965
2.134	51	4,6	1.041	15,2	3.418	25,6	5.751

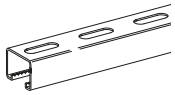
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

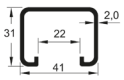
Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

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Channel MS 41- Seismic Loads

MS 41/31/2.0

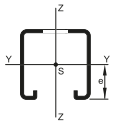




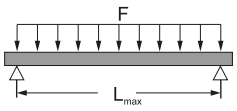
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
2,56	5,96	1,61	2,91	2,08	1,11	1,69	1,58

*All values refer to slotted channels.



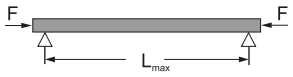
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	9,2	2.077	2	0,08
610	24	6,9	1.558	4	0,15
914	36	4,6	1.039	9	0,34
1.219	48	3,5	779	15	0,60

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



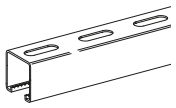
L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	25,4	5.705	38,6	8.680	43,0	9.658
610	24	18,6	4.183	33,9	7.631	39,6	8.894
914	36	10,5	2.364	25,4	5.705	33,0	7.426
1.219	48	6,6	1.479	18,6	4.183	27,0	6.064

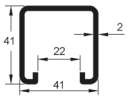
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

Channel MS 41- Seismic Loads

MS 41/41/2.0

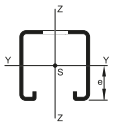




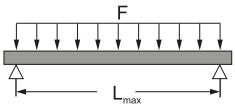
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
5,21	7,49	2,51	3,65	2,48	1,45	1,74	2,08

*All values refer to slotted channels.



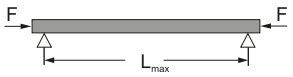
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	14,4	3.229	2	0,06
610	24	10,8	2.421	3	0,11
914	36	7,2	1.614	7	0,26
1.219	48	5,4	1.211	12	0,46
1.524	60	4,3	969	18	0,71
1.829	72	3,6	807	26	1,03
2.134	84	3,1	692	36	1,40
2.438	96	2,7	605	46	1,83
2.743	108	2,4	538	59	2,31
3.048	120	2,2	484	73	2,86

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions

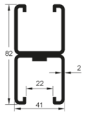


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	34,6	7.770	45,5	10.218	49,0	11.005
610	24	28,0	6.288	41,7	9.379	46,2	10.390
914	36	17,9	4.023	34,6	7.770	41,0	9.215
1.219	48	11,9	2.667	28,0	6.288	36,0	8.084
1.524	60	8,3	1.868	22,4	5.026	31,2	7.007
1.829	72	6,1	1.373	17,9	4.023	26,8	6.015
2.134	84	4,7	1.050	14,5	3.254	22,9	5.141
2.438	96	3,7	828	11,9	2.667	19,5	4.394
2.743	108	3,0	669	9,9	2.217	16,8	3.770
3.048	120	2,5	552	8,3	1.868	14,5	3.254

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

MS 41/41/2.0 D

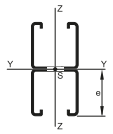




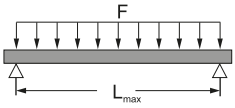
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
30,73	14,97	7,50	7,30	4,97	2,49	1,74	4,10

*All values refer to slotted channels..



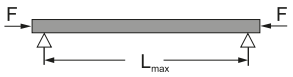
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	42,9	9.650	1	0,03
610	24	32,2	7.238	1	0,06
914	36	21,5	4.825	3	0,13
1.219	48	16,1	3.619	6	0,23
1.524	60	12,9	2.895	9	0,36
1.829	72	10,7	2.413	13	0,52
2.134	84	9,2	2.068	18	0,71
2.438	96	8,0	1.809	24	0,93
2.743	108	7,2	1.608	30	1,17
3.048	120	6,4	1.448	37	1,45

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	95,8	21.533	110,9	24.932	110,9	24.932
610	24	85,7	19.277	106,2	23.880	110,9	24.932
914	36	66,8	15.025	95,8	21.533	105,2	23.639
1.219	48	50,8	11.426	85,7	19.277	97,8	21.994
1.524	60	38,7	8.693	76,0	17.096	90,7	20.397
1.829	72	29,9	6.722	66,8	15.025	83,8	18.834
2.134	84	23,6	5.309	58,4	13.122	77,0	17.310
2.438	96	19,0	4.281	50,8	11.426	70,4	15.837
2.743	108	15,6	3.517	44,3	9.953	64,2	14.434
3.048	120	13,1	2.937	38,7	8.693	58,4	13.122

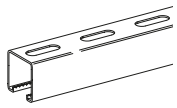
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

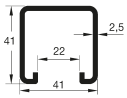
Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

10/2019

Channel MS 41- Seismic Loads

MS 41/41/2.5

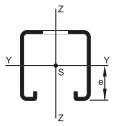




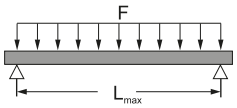
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
6,17	9,02	2,95	4,40	3,03	1,43	1,73	2,10

*All values refer to slotted channels.



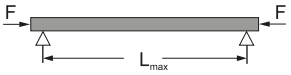
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	16,9	3.792	2	0,06
610	24	12,7	2.844	3	0,11
914	36	8,4	1.896	6	0,26
1.219	48	6,3	1.422	12	0,45
1.524	60	5,1	1.138	18	0,71
1.829	72	4,2	948	26	1,02
2.134	84	3,6	813	35	1,39
2.438	96	3,2	711	46	1,81
2.743	108	2,8	632	58	2,30
3.048	120	2,5	569	72	2,83

$F_{RD,s,eq}$ as permanent load over L. Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions

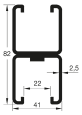


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	41,8	9.404	55,3	12.436	59,7	13.411
610	24	33,7	7.577	50,7	11.397	56,3	12.648
914	36	21,4	4.816	41,8	9.404	49,8	11.193
1.219	48	14,2	3.181	33,7	7.577	43,6	9.793
1.524	60	9,9	2.224	26,8	6.034	37,6	8.461
1.829	72	7,3	1.634	21,4	4.816	32,2	7.243
2.134	84	5,6	1.248	17,3	3.887	27,5	6.173
2.438	96	4,4	983	14,2	3.181	23,4	5.265
2.743	108	3,5	795	11,8	2.642	20,1	4.510
3.048	120	2,9	655	9,9	2.224	17,3	3.887

Gilt nur für zentrische Knicklasten.
Max. zul. Spannung f_{zul} = 235 N/mm².

MS 41/41/2.5 D

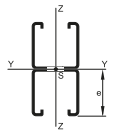




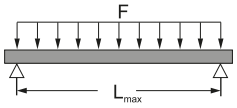
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
36,74	18,03	8,96	8,80	6,07	2,46	1,72	4,10

*All values refer to slotted channels..



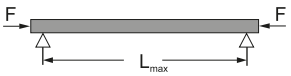
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	51,3	11.535	1	0,03
610	24	38,5	8.651	1	0,06
914	36	25,7	5.768	3	0,13
1.219	48	19,2	4.326	6	0,23
1.524	60	15,4	3.461	9	0,36
1.829	72	12,8	2.884	13	0,52
2.134	84	11,0	2.472	18	0,71
2.438	96	9,6	2.163	24	0,93
2.743	108	8,6	1.923	30	1,17
3.048	120	7,7	1.730	37	1,45

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



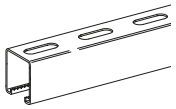
L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	116,6	26.218	135,5	30.462	135,5	30.462
610	24	104,2	23.434	129,5	29.112	135,5	30.462
914	36	80,9	18.198	116,6	26.218	128,2	28.815
1.219	48	61,3	13.791	104,2	23.434	119,1	26.786
1.524	60	46,6	10.466	92,3	20.744	110,4	24.815
1.829	72	35,9	8.080	80,9	18.198	101,8	22.888
2.134	84	28,4	6.375	70,6	15.863	93,4	21.008
2.438	96	22,8	5.137	61,3	13.791	85,4	19.195
2.743	108	18,8	4.218	53,4	11.996	77,7	17.472
3.048	120	15,7	3.521	46,6	10.466	70,6	15.863

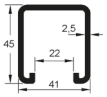
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

Channel MS 41- Seismic Loads

MS 41/45/2.5

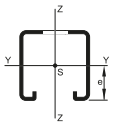




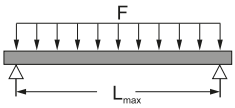
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
7,86	9,76	3,42	4,76	3,23	1,56	1,74	2,29

*All values refer to slotted channels.



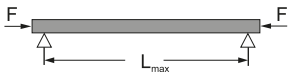
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	19,6	4.408	1	0,06
610	24	14,7	3.306	3	0,10
914	36	9,8	2.204	6	0,23
1.219	48	7,4	1.653	11	0,41
1.524	60	5,9	1.322	16	0,65
1.829	72	4,9	1.102	24	0,93
2.134	84	4,2	945	32	1,27
2.438	96	3,7	826	42	1,66
2.743	108	3,3	735	53	2,10
3.048	120	2,9	661	66	2,59

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

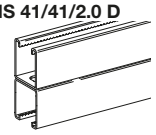
[1) 3)] Max. allowable buckling load under seismic conditions

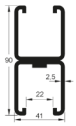


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	46,9	10.552	60,2	13.544	64,5	14.507
610	24	38,7	8.709	55,7	12.520	61,2	13.754
914	36	25,6	5.752	46,9	10.552	54,8	12.319
1.219	48	17,3	3.879	38,7	8.709	48,7	10.938
1.524	60	12,2	2.741	31,5	7.087	42,7	9.609
1.829	72	9,0	2.027	25,6	5.752	37,2	8.363
2.134	84	6,9	1.555	20,9	4.698	32,2	7.236
2.438	96	5,5	1.229	17,3	3.879	27,8	6.251
2.743	108	4,4	995	14,4	3.241	24,1	5.408
3.048	120	3,7	822	12,2	2.741	20,9	4.698

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

MS 41/41/2.0 D

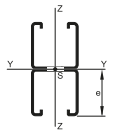




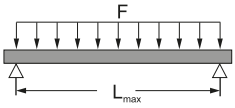
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
47,19	19,52	10,49	9,52	6,47	2,70	1,74	4,50

*All values refer to slotted channels..



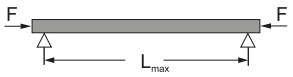
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	60,0	13.500	1	0,03
610	24	45,0	10.125	1	0,05
914	36	30,0	6.750	3	0,12
1.219	48	22,5	5.062	5	0,21
1.524	60	18,0	4.050	8	0,33
1.829	72	15,0	3.375	12	0,48
2.134	84	12,9	2.893	16	0,65
2.438	96	11,3	2.531	21	0,84
2.743	108	10,0	2.250	27	1,07
3.048	120	9,0	2.025	34	1,32

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	127,9	28.755	144,4	32.470	144,4	32.470
610	24	115,8	26.025	140,6	31.601	144,4	32.470
914	36	92,6	20.824	127,9	28.755	139,3	31.308
1.219	48	72,3	16.243	115,8	26.025	130,4	29.313
1.524	60	56,0	12.595	104,0	23.373	121,8	27.380
1.829	72	43,9	9.864	92,6	20.824	113,4	25.488
2.134	84	34,9	7.857	82,0	18.430	105,1	23.635
2.438	96	28,3	6.373	72,3	16.243	97,1	21.828
2.743	108	23,4	5.258	63,6	14.297	89,3	20.087
3.048	120	19,6	4.405	56,0	12.595	82,0	18.430

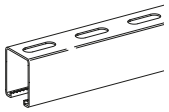
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

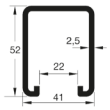
Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

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Channel MS 41- Seismic Loads

MS 41/52/2.5

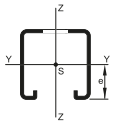




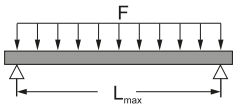
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
11,43	11,06	4,33	5,39	3,58	1,79	1,76	2,64

*All values refer to slotted channels.



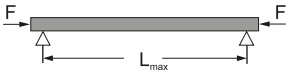
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	24,8	5.570	1	0,05
610	24	18,6	4.177	2	0,09
914	36	12,4	2.785	5	0,20
1.219	48	9,3	2.089	9	0,36
1.524	60	7,4	1.671	14	0,56
1.829	72	6,2	1.392	21	0,81
2.134	84	5,3	1.194	28	1,10
2.438	96	4,6	1.044	37	1,44
2.743	108	4,1	928	46	1,82
3.048	120	3,7	835	57	2,25

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

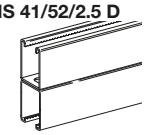
[1) 3)] Max. allowable buckling load under seismic conditions

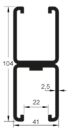


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	53,1	11.939	65,1	14.634	67,4	15.151
610	24	45,6	10.243	61,0	13.710	65,9	14.824
914	36	32,3	7.270	53,1	11.939	60,2	13.529
1.219	48	22,8	5.127	45,6	10.243	54,7	12.287
1.524	60	16,5	3.716	38,5	8.665	49,3	11.081
1.829	72	12,4	2.788	32,3	7.270	44,1	9.916
2.134	84	9,6	2.159	27,1	6.092	39,2	8.816
2.438	96	7,6	1.717	22,8	5.127	34,7	7.803
2.743	108	6,2	1.397	19,3	4.346	30,7	6.894
3.048	120	5,2	1.158	16,5	3.716	27,1	6.092

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

MS 41/52/2.5 D

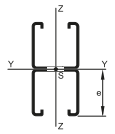




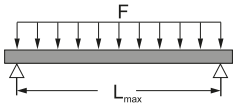
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
69,76	22,12	13,41	10,79	7,17	3,12	1,76	5,20

*All values refer to slotted channels..



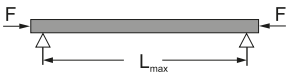
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	76,8	17.270	1	0,03
610	24	57,6	12.952	1	0,05
914	36	38,4	8.635	3	0,10
1.219	48	28,8	6.476	5	0,18
1.524	60	23,0	5.181	7	0,29
1.829	72	19,2	4.317	10	0,41
2.134	84	16,5	3.701	14	0,56
2.438	96	14,4	3.238	19	0,73
2.743	108	12,8	2.878	23	0,92
3.048	120	11,5	2.590	29	1,14

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



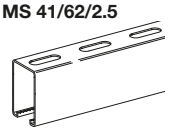
L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	147,3	33.115	160,1	35.983	160,1	35.983
610	24	135,5	30.453	159,7	35.903	160,1	35.983
914	36	112,7	25.341	147,3	33.115	158,4	35.616
1.219	48	91,7	20.611	135,5	30.453	149,7	33.660
1.524	60	73,6	16.550	123,9	27.864	141,3	31.773
1.829	72	59,1	13.293	112,7	25.341	133,1	29.930
2.134	84	47,9	10.776	101,9	22.910	125,1	28.120
2.438	96	39,4	8.848	91,7	20.611	117,2	26.341
2.743	108	32,8	7.365	82,2	18.483	109,4	24.600
3.048	120	27,6	6.211	73,6	16.550	101,9	22.910

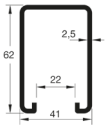
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

Channel MS 41- Seismic Loads

MS 41/62/2.5

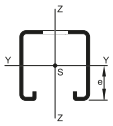




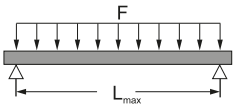
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
18,09	12,91	5,76	6,30	4,08	2,11	1,78	3,14

*All values refer to slotted channels.



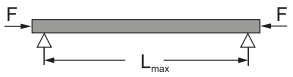
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	33,0	7.415	1	0,04
610	24	24,7	5.561	2	0,08
914	36	16,5	3.707	4	0,17
1.219	48	12,4	2.780	8	0,30
1.524	60	9,9	2.224	12	0,47
1.829	72	8,2	1.854	17	0,68
2.134	84	7,1	1.589	24	0,93
2.438	96	6,2	1.390	31	1,21
2.743	108	5,5	1.236	39	1,53
3.048	120	4,9	1.112	48	1,89

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions

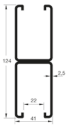


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	64,5	14.510	76,4	17.170	76,8	17.264
610	24	57,1	12.831	72,3	16.254	76,8	17.264
914	36	43,2	9.718	64,5	14.510	71,5	16.075
1.219	48	32,0	7.204	57,1	12.831	66,1	14.852
1.524	60	24,0	5.386	49,9	11.220	60,8	13.663
1.829	72	18,3	4.118	43,2	9.718	55,6	12.502
2.134	84	14,4	3.228	37,2	8.372	50,6	11.377
2.438	96	11,5	2.590	32,0	7.204	45,8	10.302
2.743	108	9,4	2.120	27,6	6.214	41,4	9.297
3.048	120	7,9	1.766	24,0	5.386	37,2	8.372

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

MS 41/62/2.5 D

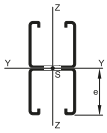




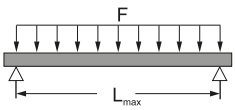
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
112,63	25,83	18,17	12,60	8,17	3,71	1,78	6,20

*All values refer to slotted channels..



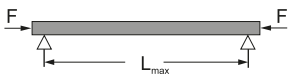
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	104,0	23.387	1	0,02
610	24	78,0	17.540	1	0,04
914	36	52,0	11.694	2	0,09
1.219	48	39,0	8.770	4	0,15
1.524	60	31,2	7.016	6	0,24
1.829	72	26,0	5.847	9	0,34
2.134	84	22,3	5.012	12	0,47
2.438	96	19,5	4.385	16	0,61
2.743	108	17,3	3.898	20	0,78
3.048	120	15,6	3.508	24	0,96

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	174,5	39.234	182,4	41.002	182,4	41.002
610	24	162,9	36.629	182,4	41.002	182,4	41.002
914	36	140,7	31.632	174,5	39.234	182,4	41.002
1.219	48	119,5	26.866	162,9	36.629	176,9	39.769
1.524	60	100,0	22.489	151,7	34.104	168,7	37.919
1.829	72	83,1	18.690	140,7	31.632	160,7	36.119
2.134	84	69,1	15.544	130,0	29.214	152,8	34.354
2.438	96	57,8	13.005	119,5	26.866	145,1	32.615
2.743	108	48,8	10.976	109,5	24.615	137,5	30.901
3.048	120	41,6	9.352	100,0	22.489	130,0	29.214

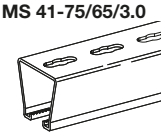
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

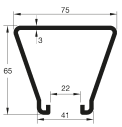
Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

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Channel MS 41- Seismic Loads

MS 41-75/65/3.0

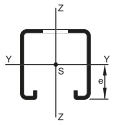




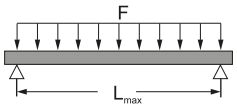
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
30,68	38,51	8,13	10,27	6,04	2,25	2,53	3,77

*All values refer to slotted channels.



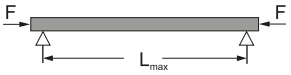
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	46,6	10.467	1	0,04
610	24	34,9	7.850	2	0,06
914	36	23,3	5.234	4	0,14
1.219	48	17,5	3.925	6	0,25
1.524	60	14,0	3.140	10	0,39
1.829	72	11,6	2.617	14	0,57
2.134	84	10,0	2.243	20	0,77
2.438	96	8,7	1.963	26	1,01
2.743	108	7,8	1.745	32	1,27
3.048	120	7,0	1.570	40	1,57

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

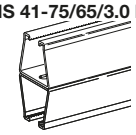
[1) 3)] Max. allowable buckling load under seismic conditions

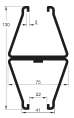


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	97,6	21.943	113,5	25.506	113,5	25.506
610	24	87,2	19.609	108,4	24.369	113,5	25.506
914	36	67,7	15.221	97,6	21.943	107,3	24.120
1.219	48	51,3	11.530	87,2	19.609	99,7	22.419
1.524	60	38,9	8.748	77,2	17.355	92,4	20.767
1.829	72	30,0	6.752	67,7	15.221	85,2	19.151
2.134	84	23,7	5.327	59,0	13.265	78,2	17.576
2.438	96	19,1	4.292	51,3	11.530	71,4	16.056
2.743	108	15,7	3.524	44,6	10.028	65,0	14.613
3.048	120	13,1	2.942	38,9	8.748	59,0	13.265

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

MS 41-75/65/3.0 D

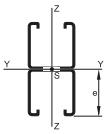




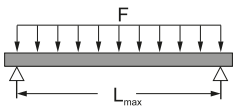
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
151,10	77,03	23,25	20,54	12,07	3,54	2,53	6,50

*All values refer to slotted channels..



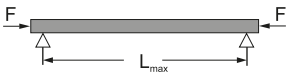
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	133,1	29.927	1	0,02
610	24	99,8	22.445	1	0,04
914	36	66,6	14.963	2	0,08
1.219	48	49,9	11.222	4	0,15
1.524	60	39,9	8.978	6	0,23
1.829	72	33,3	7.482	8	0,33
2.134	84	28,5	6.413	11	0,45
2.438	96	25,0	5.611	15	0,58
2.743	108	22,2	4.988	19	0,74
3.048	120	20,0	4.489	23	0,91

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



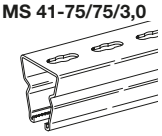
L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	255,3	57.384	269,5	60.577	269,5	60.577
610	24	237,4	53.371	269,5	60.577	269,5	60.577
914	36	203,1	45.666	255,3	57.384	269,5	60.577
1.219	48	170,6	38.359	237,4	53.371	258,9	58.208
1.524	60	141,2	31.751	220,1	49.476	246,2	55.359
1.829	72	116,3	26.135	203,1	45.666	233,9	52.585
2.134	84	96,0	21.572	186,6	41.948	221,8	49.862
2.438	96	79,8	17.947	170,6	38.359	209,9	47.180
2.743	108	67,1	15.083	155,4	34.945	198,1	44.540
3.048	120	57,0	12.812	141,2	31.751	186,6	41.948

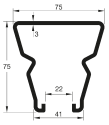
Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

Channel MS 41- Seismic Loads

MS 41-75/75/3,0

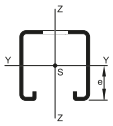




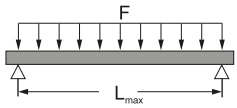
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
44,30	42,80	10,29	11,42	6,92	2,53	2,49	4,30

*All values refer to slotted channels.



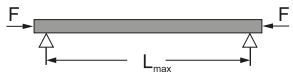
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	58,9	13.252	1	0,03
610	24	44,2	9.939	1	0,06
914	36	29,5	6.626	3	0,12
1.219	48	22,1	4.970	6	0,22
1.524	60	17,7	3.976	9	0,34
1.829	72	14,7	3.313	13	0,50
2.134	84	12,6	2.840	17	0,68
2.438	96	11,1	2.485	22	0,88
2.743	108	9,8	2.209	28	1,12
3.048	120	8,8	1.988	35	1,38

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

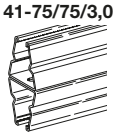
[1) 3)] Max. allowable buckling load under seismic conditions

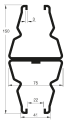


L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	115,9	26.057	130,1	29.251	130,1	29.251
610	24	105,2	23.643	127,1	28.576	130,1	29.251
914	36	84,7	19.034	115,9	26.057	126,0	28.317
1.219	48	66,5	14.940	105,2	23.643	118,1	26.551
1.524	60	51,8	11.642	94,7	21.296	110,5	24.841
1.829	72	40,7	9.149	84,7	19.034	103,1	23.168
2.134	84	32,5	7.304	75,2	16.900	95,8	21.528
2.438	96	26,4	5.933	66,5	14.940	88,6	19.926
2.743	108	21,8	4.901	58,6	13.185	81,8	18.378
3.048	120	18,3	4.109	51,8	11.642	75,2	16.900

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm².

MS 41-75/75/3,0 D

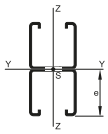




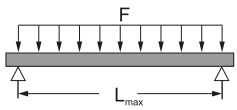
Technical Data

I_y [cm⁴]	I_z [cm⁴]	W_y [cm³]	W_z [cm³]	A [cm²]	i_y [cm]	i_z [cm]	e [cm]
230,02	85,60	30,67	22,83	13,84	4,08	2,49	7,50

*All values refer to slotted channels..



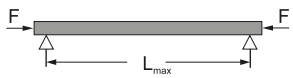
[1) 2)] Max. allowable uniform bending load under seismic conditions



L_{max}		$F = F_{RD,s,eq}$		Deflection	
mm	in	kN	Lbs	mm	in
457	18	175,6	39.483	0	0,02
610	24	131,7	29.613	1	0,03
914	36	87,8	19.742	2	0,07
1.219	48	65,9	14.806	3	0,13
1.524	60	52,7	11.845	5	0,20
1.829	72	43,9	9.871	7	0,29
2.134	84	37,6	8.461	10	0,39
2.438	96	32,9	7.403	13	0,51
2.743	108	29,3	6.581	16	0,64
3.048	120	26,3	5.923	20	0,79

$F_{RD,s,eq}$ as permanent load over L.
Max. allowable stress f_{zul} = 327,5 N/mm².

[1) 3)] Max. allowable buckling load under seismic conditions



L_{max}		$F_{RD,s,eq}$ for K=2,0		$F_{RD,s,eq}$ for K=1,0		$F_{RD,s,eq}$ for K=0,7	
mm	in	kN	Lbs	kN	Lbs	kN	Lbs
457	18	301,1	67.689	309,0	69.471	309,0	69.471
610	24	283,0	63.616	309,0	69.471	309,0	69.471
914	36	248,3	55.825	301,1	67.689	309,0	69.471
1.219	48	215,0	48.344	283,0	63.616	304,8	68.527
1.524	60	183,7	41.304	265,5	59.677	291,9	65.631
1.829	72	155,6	34.975	248,3	55.825	279,4	62.820
2.134	84	131,4	29.535	231,5	52.043	267,2	60.067
2.438	96	111,2	25.004	215,0	48.344	255,1	57.357
2.743	108	94,7	21.293	199,1	44.752	243,2	54.683
3.048	120	81,3	18.268	183,7	41.304	231,5	52.043

Only valid for centric buckling loads.
Max. allowable stress f_{zul} = 235 N/mm²

Notes:
1. All loads values under seismic loading conditions.
2. The max. permissible load of the connected elements on the channel must be verified separately.
3. Flexural buckling according to DIN EN 1993-1-5 and DIN EN 1993-1-3. The values are not allowed for offset torque/oblique position/lateraltorsional buckling and must be adjusted by new conditions.

10/2019

Components: Technical information

Component load values valid under seismic impact

Pipe clamps Stabil D-3G w/ lining



Clamping range [mm]	$F_{Rd,s,eq}$ (V) [kN]	Tightening torque [Nm]
14-23	2,8	2
24-65	5,5	2
67-115	8,2	3
124-162	15,5	5
165-318	15,5	10

Material: Steel, electro-galvanised

Pipe clamps Stabil D-3G



Clamping range [mm]	$F_{Rd,s,eq}$ (V) [kN]
15-24	4,0
25-72	7,0
76-129	8,2
133-173	15,5
176-316	15,5

Material: Steel, electro-galv.; SBR/EPDM

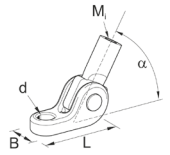
Pipe clamps Stabil RB-A

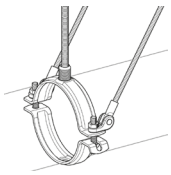


Clamping range [mm]	Tightening torque [Nm]
13-49	20
57-89	40
90-169	40
188-610	100

Material: Steel, surface black

Support joint SG

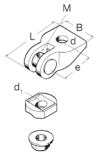




Suitable support joint / Clamp combinations:	Type	Part no.	Brace angle α	$F_{RD,s,eq}$ [kN]	d [mm]	B [mm]	L [mm]
SG M10-11: Stabil D-3G (133-140 to 167-173) Stabil D-A (76-81 to 124-129) Stabil RB-A (13-18 to 45-49)	SG M10-11	115044	0 - 45°	27	11	20	52
			90°	9			
SG M10-13: Stabil D-3G (176-184 to 310-316) Stabil D-A (133-140 to 297-303) Stabil RB-A (57-61 to 214-220) Stabil D-M16 (218-227 and 271-277)	SG M10-13	115045	0 - 45°	27	13	22	54
			90°	10,8			
SG M10-17: Stabil D-A (316-324 to 513-521) Stabil RB-A (248-254 to 603-610)	SG M10-17	115046	0 - 45°	27	17	27	59,5
			90°	12,6			

Material: Joint: cast iron, electro-galv.; link eye: steel, electro-galv.

Universal Joint UG



Type	Part no.	Pivot bolt	A [mm]	B [mm]	ø D [mm]	L [mm]	$F_{Rd,s,eq}$ (V) [kN]	$F_{Rd,s,eq}$ (H) [kN]	Maintenance unit
UG M10	198643	M10	26	40	10,5	51	14,5	5,0	Flange nut
UG M12	158075	M12	33	50	17	71	23,5	-	Flange nut
UG FP M12	158093	M16	33	50	17	71	14,5	-	Flange nut

Material: Steel, electro-galv. (M10); cast iron, electro-galv. (UG M12 + FP M12)

Components: Technical information

Component load values valid under seismic impact

Threaded rod GST



Thread	Item no.	$F_{Rd,s,eq}$ * [kN]
M10	124568	17,0
M12	143192	20,0
M16	110817	20,0

Material: Steel class 4.8, electro-galv.; *system limit

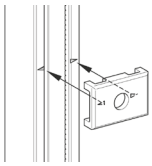
Threaded tube GR



Screw thread as per DIN EN ISO 228	Item no.
G ½“	151102
G ¾“	151111
G 1“	151120

Material: Steel, electro-galvanised

Holding bracket HK 41



Type	Item no.	Bore [mm]
41/10	178247	11
41/12	178256	13
41/16	178265	17

Material: Cast iron, electro-galv.

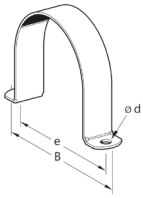
Hexagon nut NT

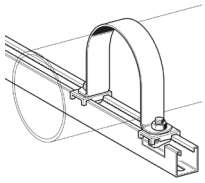


Type	Item no.
M10	137546
M12	114228
M16	114237

Material: Steel, electro-galvanised

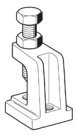
U clamp RUC





Type	For pipe	Material [mm]	B [mm]	L [mm]	Ø D [mm]	Item no.
18	3/8“	30 x 2,5	69	49	9	159012
22	1/2“	30 x 2,5	73	53	9	159021
28	3/4“	30 x 2,5	79	59	9	159030
34	1“	30 x 2,5	85	65	9	159049
43	1 1/4“	30 x 2,5	94	74	9	159058
49	1 1/2“	30 x 2,5	100	80	9	159067
61	2“	30 x 2,5	112	92	9	159076
77	2 1/2“	30 x 2,5	128	108	9	159085
90	3“	30 x 2,5	141	121	9	159094
115	4“	40 x 3,0	183	155	13	159100
141	5“	40 x 3,0	209	181	13	159119
169	6“	40 x 3,0	236	207	13	159128
221	8“	40 x 3,0	289	261	13	159137
275	10“	50 x 5,0	375	325	17	159146
326	12“	50 x 5,0	426	373	17	159155

Beam Clamp HK 41



Type	Item no.	$F_{Rd,s,eq}$ (V) [kN]
TCS1-M10-M10	116150	15,57
TCS1-M10-M12	167332	12,22
TCS2-M12-M12	174224	30,10
TCS2-M12-M16	174215	31,71

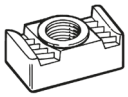
Material: Cast iron, electro-galv.

10/2019

Components: Technical information

Component load values valid under seismic impact

Channel nut NT 41 + NT HZ 41

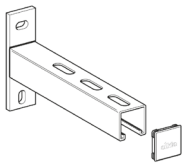




Type	Item no.	$F_{Rd,s,eq}$ (V) [kN]	$F_{Rd,s,eq}$ [1] (H) [kN]
Hz41 M8/MS1,5	151935	4,5	7,0
Hz41 M8/MS2,0	151935	12,5	7,0
Hz41 M8/MS2,5	151935	13,5	7,0
Hz41 M8/MS3,0	151935	14,0	7,0
Hz41 M10/MS1,5	151944	4,5	7,0
Hz41 M10/MS2,0	151944	12,5	7,0
Hz41 M10/MS2,5	151944	13,5	7,0
Hz41 M10/MS3,0	151944	16,0	7,0
Hz41 M12/MS1,5	182288	4,5	12,0
Hz41 M12/MS2,0	182288	12,5	12,0
Hz41 M12/MS2,5	182288	14,0	12,0
Hz41 M12/MS3,0	182288	20,0	12,0
Hz41 M16/MS1,5	182297	4,5	9,0
Hz41 M16/MS2,0	182297	12,5	9,0
Hz41 M16/MS2,5	182297	14,0	9,0
Hz41 M16/MS3,0	182297	20,0	9,0
NT41 M8/MS1,5	174170	4,5	7,0
NT41 M8/MS2,0	174170	12,5	7,0
NT41 M8/MS2,5	174170	13,5	7,0
NT41 M8/MS3,0	174170	14,0	7,0
NT41 M10/MS1,5	147179	17,0	7,0
NT41 M10/MS2,0	147179	17,0	7,0
NT41 M10/MS2,5	174179	17,0	7,0
NT41 M10/MS3,0	174179	17,0	7,0

Material: Steel, electro-galvanised, [1] Type with holding bracket HK 41

Cantilever bracket AK 41



Type	Item no.	$F_{Rd,s,eq}$ (V)	
		Distance [mm]	[kN]
41/41-320	115618	140	11,73
41/41/445	115627	203	6,89
41/62-320	113296	300	8,29
41/62-445	113297	223	4,80
41/62-570	113298	285	8,75
41/62-445	113297	425	2,52

Material: Steel, electro-galvanised

Fixing bracket MW S



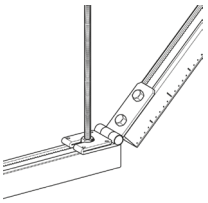
Type	Item no.	$F_{Rd,s,eq}$ (V) [kN]	$F_{Rd,s,eq}$ (H) [kN
45/30/90°	115380	9,7	4,2
60/40/90°	115399	26,3	8,8

Material: Steel, electro-galvanised

Components: Technical information

Component load values valid under seismic impact

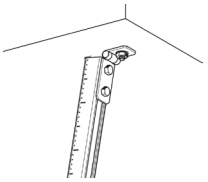
Joint JOI R



Type	Part no.	Load direction	$F_{Rd,s,eq}$ (V) [kN]	Tightening torque [Nm]	suitable for
20	116576	45°	5,98	50	Hexagon nut M10 and 3/8"-UNC
		90°	5,66		
		0°	5,22		
23	116809	45°	5,98	50	Flange nut M10, hexagon nut M12 and 1/2"-UNC
		90°	5,66		
		0°	5,22		

Material: Steel, electro-galvanised

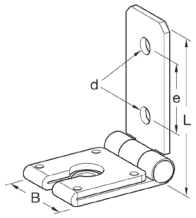
Joint JOI S

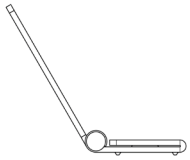


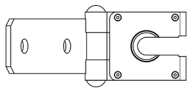
Type	Part no.	Load direction	$F_{Rd,s,eq}$ (V) [kN]	Tightening torque [Nm]
S	116577	45°	5,98	50
		90°	5,66	
		0°	5,22	

Material: Steel, electro-galvanised

Joint JOI R







Application:
The joint JOI R is used for bracing assembly systems, which are of central importance especially in case of seismic stress. Due to its keyhole design the joint can be installed subsequently. When mounted directly on a channel 41 the four pins and two fixing points guarantee a reliable rotation lock. The joint JOI R can also be stacked with two struts. The rotation lock when attaching to existing brackets depends on the components already in use. In case of the application of a block PB 41 a rotation lock is provided. In case of the application of a holding bracket or a washer a rotation lock is only available to a limited extent

Technical Data:

Type	Part no.	a [mm]	b [mm]	d [mm]	l [mm]	Load direction	$F_{Rd,s,eq}$ (N) [kN]	Tightening torque [Nm]	suitable for
20	116576	62,5	50	10,5	126	45°	5,98	50	Hexagon nut M10 and 3/8"-UNC
						90°	5,66		
						0°	5,22		
23	116809	62,5	50	10,5	126	45°	5,98	50	Flange nut M10, hexagon nut M12 and 1/2"-UNC
						90°	5,66		
						0°	5,22		

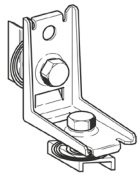
Material: Steel, electro-galvanised

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Components: Technical information

Component load values valid under seismic impact

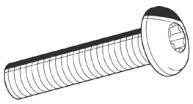
Connector CN CC 41 Stabil



Type	Part no.	$F_{Rd,s,eq}$ [+Vz] [kN]	$F_{Rd,s,eq}$ [-Vz] [kN]	$F_{Rd,s,eq}$ [Vy] [kN]	$F_{Rd,s,eq}$ [My] [kNm]	$F_{Rd,s,eq}$ [Mz] [kNm]
CC 41-90° Stabil	191675	3,32	2,40	1,82	0,05	0,08
CC 41-90° W Stabil	191684	2,20	2,40	-	0,05	

Material: Steel, electro-galvanised

Flange screw SCR FLA HCP



Technical Data:
M10 x 15 and M10 x 25
Max. permissible tightening torque: 50 Nm
Drive: Hexagon socket SW 6

TT M10 x 25 and TT M10 x 30
Max. permissible tightening torque: 20 Nm
Drive: Torx-T50

Type	Part no.	Length [mm]
M10 x 15	199107	15
M10 x 25	198353	25
TT M10 x 25	110503	25
TT M10 x 30	116479	30

Material: Steel, HCP

Assembly instructions

Universal joint UG

Application

Universal connection to inclined components due to infinitely variable angle adjustment. May be fixed directly to building surfaces, beam clamps, channels, etc., in particular as an angular support on brackets and for strutting sliding and fixed points (types UG FP for fixed point constructions for direct screwing to the flanges of the pipe clamp):

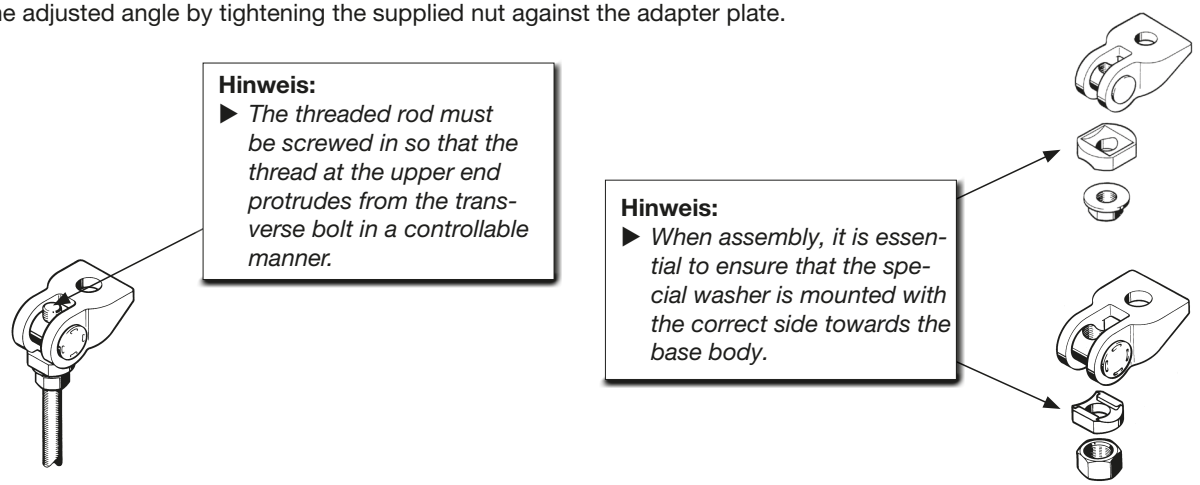
- Infinitely variable angle adjustment
- Length and height adjustment via rotation of the grub screw in the threaded pivot head
- Securely retained threaded pivot head
- Secure attachment of nut on the adapter plate.

Scope of delivery

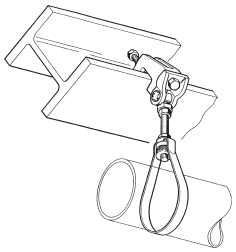
With adapter plate and nut.

Installation

Screw the grub screw completely into the pivot head (visual control).
Fix the adjusted angle by tightening the supplied nut against the adapter plate.

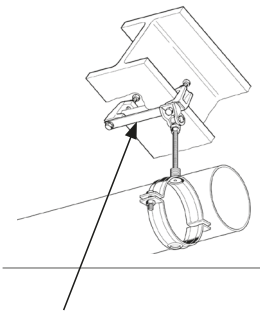


Assembly Instructions for use in VdS systems



a) For use with tilted beam 10° to 45°

Pipe size	Universal joint	Assembly distance max.	Pipe support connection	Beam clamp	Hexagon bolt + washer DIN 125
up to DN 50	UG M8	4 m	M 8	TCS 1 M10/M8	M8 x 25
DN 50 up to DN 100	UG M10	4 m	M10	TCS 1 M10/M10	M10 x 25
DN 100 up to DN 150	UG M12	4 m	M12	TCS 2 M12/M12	M12 x 30
DN 200	UG M16	4 m	M16	TCS 2 M12/M16	M16 x 30



b) For use with angled beam 10° to 45°

Pipe size	Universal joint	Safety strap	Assembly distance max.	Pipe support connection	Beam clamp	Hexagon bolt + washer DIN 125
up to DN 50	UG M8	Type 1 So	4 m	M 8	TCS 1 M10/M8	M8 x 25
DN 50 up to DN 100	UG M10	Type 1 So	4 m	M10	TCS 1 M10/M10	M10 x 25
DN 100 up to DN 150	UG M12	Type 2 So	4 m	M12	TCS 2 M12/M12	M12 x 30
DN 200	UG M16	Type 3 So	4 m	M16	TCS 2 M12/M16	M16 x 30

Type	Bore distance [mm]	Length of strap [mm]
Type 1 SO	B + 22	B + 46
Type 2 SO	B + 28	B + 58
Type 3 SO	B + 34	B + 74
B = flange width		

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Beam clamp TCS

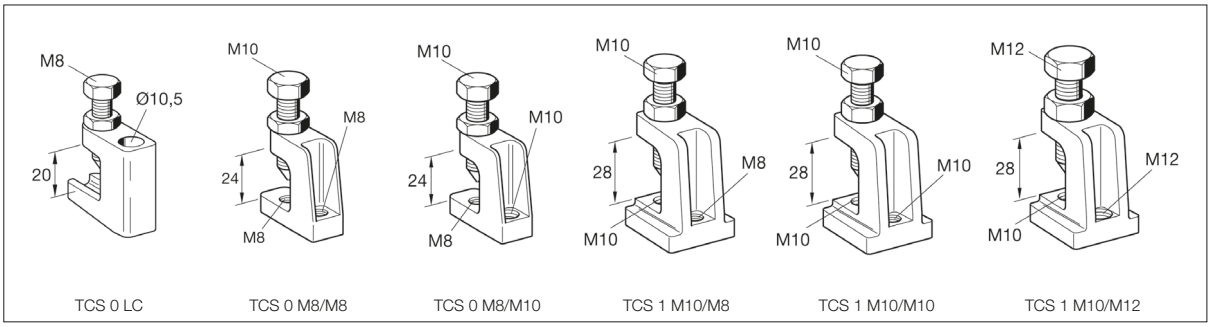
Application

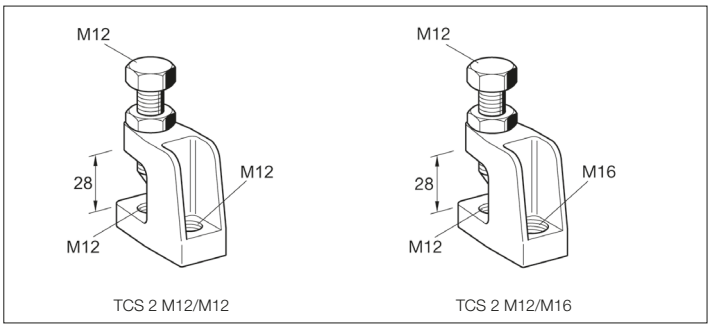
The beam clamp is a heavy-duty connection element and is suitable for assembly pipes, ducts and devices on steel profiles (I-, T-, U-beams and angle profiles).

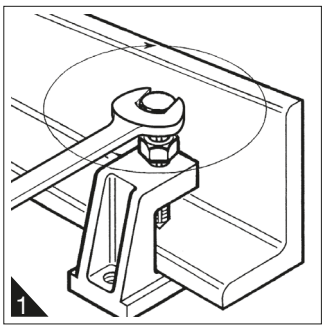
- The combination with the universal joint allows vertical alignment on inclined beams.
- Can be used as a single fastening or for assembly crossbars and cantilevered constructions.
- Beam clamps of group TCS 1 are particularly suitable for assembly in the rail slot of the Sikla 41 mm channels due to the special profile at their base.

Scope of delivery

Cast body with clamping bolt and locking nut completely pre-assembled.

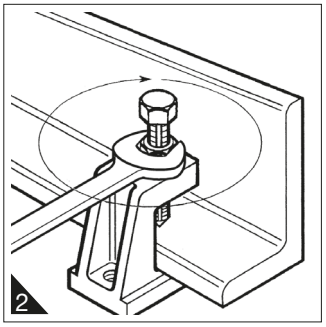






Installation

1. Position the beam clamp, tighten the clamping screw by hand (turn back the lock nut if necessary). Tighten the clamping screw:
   TCS 0: 1 revolution
   TCS 1 and 2: 1 to max. 1 1/2 revolutions
2. Tighten the locking nut.



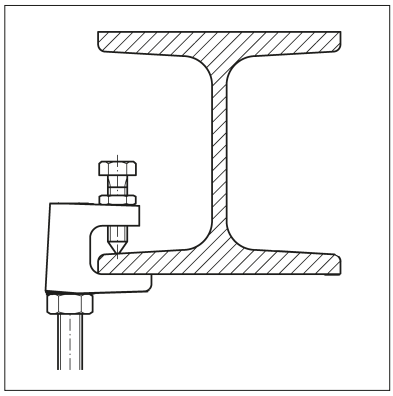
Nominal load

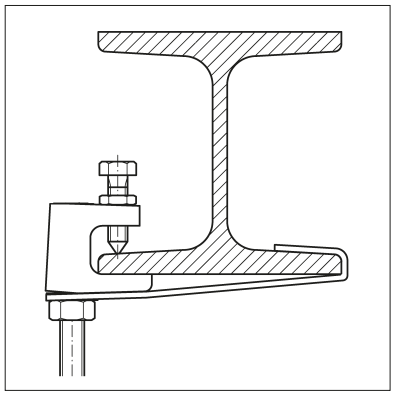
Group TCS 0: 3.5 kN
Group TCS 1: 5.0 kN
Group TCS 2: 8.5 kN

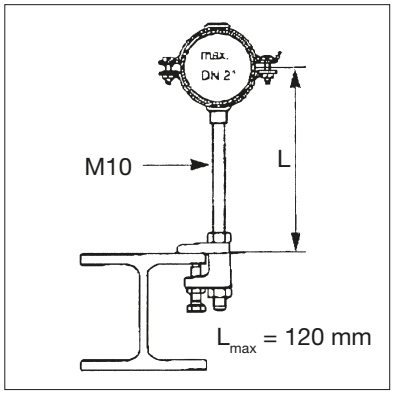
These nominal loads apply only to new TCS on the undamaged beam flange.

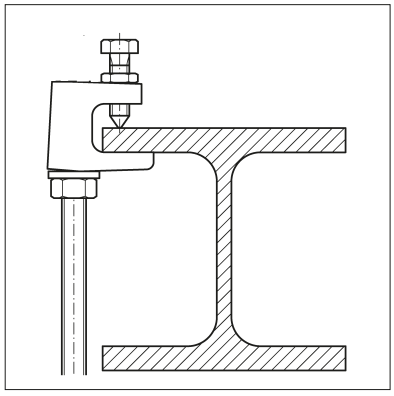
Application determination for sprinkler lines according to VdS / FM			
Nominal width	Beam clamp (group)	required threaded connection (tensile load)	required safety strap acc. to VDS
≤ DN 50 (VdS)	TCS 1 / TCS 0	M 8 (0 LC with flange nut)	
≤ DN 50 (FM)	TCS 1 / TCS 0	M10	
> DN 50 ≤ DN 100	TCS 1 / TCS 0	M10	Type 1 (> DN 65 only)
> DN 50 ≤ DN 100	TCS 1 / TCS 0	M12	Type 1
> DN 50 ≤ DN 100	TCS 1 / TCS 0	M12	Type 1
For FM installations only use thread ≥ M10			

Assembly examples

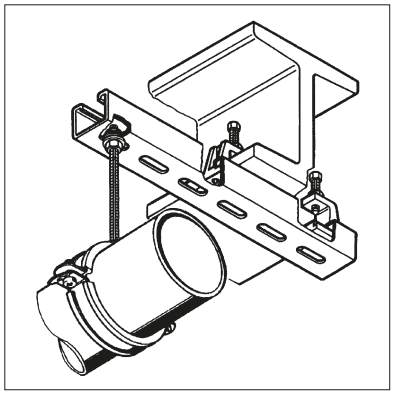


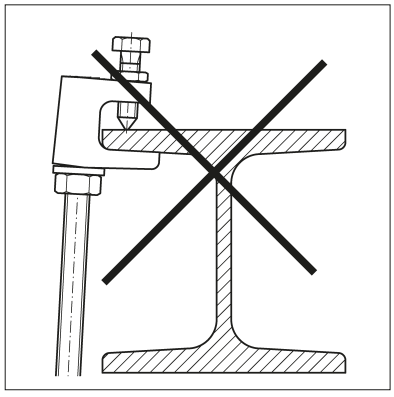






Caution!
▶ *Arrangement only permitted for parallel flange beams.*

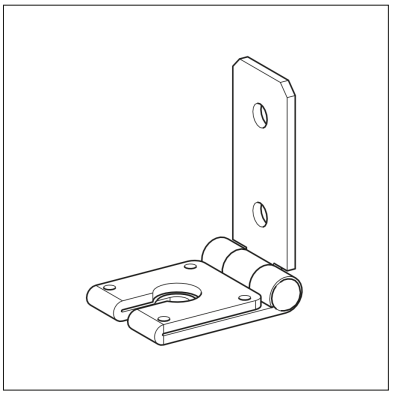




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Joint JOI R

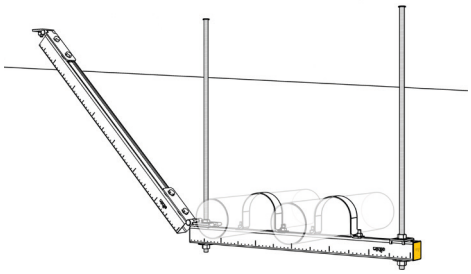
Application

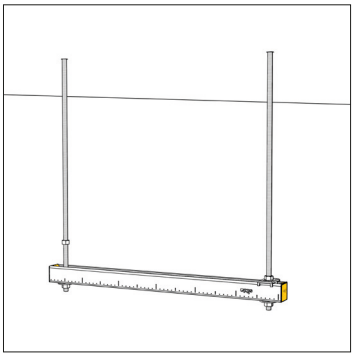


The joint JOI R is used for bracing assembly systems, which are of central importance especially in case of seismic stress. Due to its keyhole design the joint can be installed subsequently. When mounted directly on a channel 41 the four pins and two fixing points guarantee a reliable rotation lock. The joint JOI R can also be stacked with two struts. The rotation lock when attaching to existing brackets depends on the components already in use. In case of the application of a block PB 41 a rotation lock is provided. In case of the application of a holding bracket or a washer a rotation lock is only available to a limited extent.

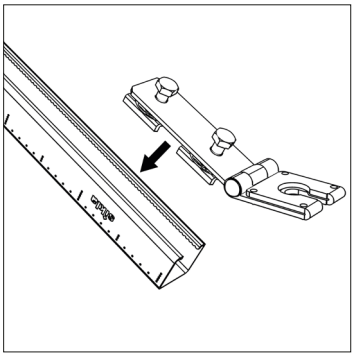
Type	suitable for
20	Hexagon nut M10 and 3/8"-UNC
23	Flange nut M10, hexagon nut M12 and 1/2"-UNC

a) New installation

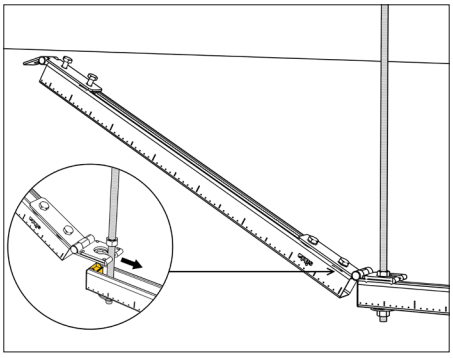




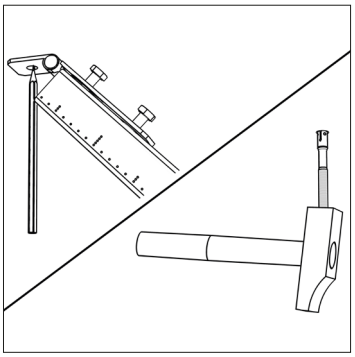
1. Mount the channel to the ceiling using threaded rods and nut/washer/holding bracket.



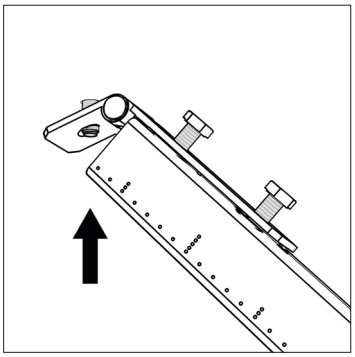
2. Fasten joint JOI R with 2 x M10 threaded plates to the channel for the strut.



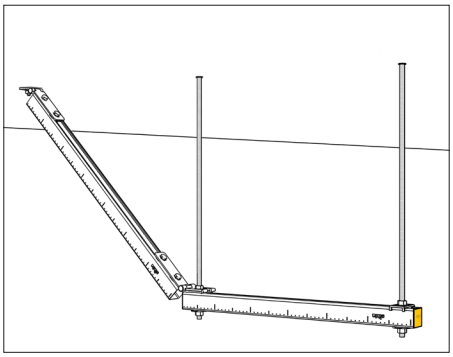
3. Mount joint JOI R on the channel to be braced. Fasten joint JOI S to the other end of the channel using 2 x M10 threaded plates (do not tighten the screws yet).



4. Determine the anchor position on the ceiling using a pre-fixed JOI S joint. Then set the bolt anchor AN BZplus.

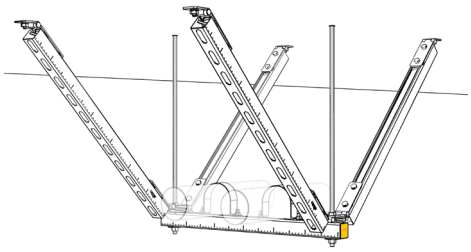


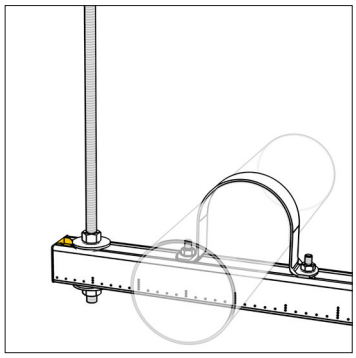
5. Mount joint JOI S on bolt anchor AN BZ and tighten the still loose M10 threaded plates.

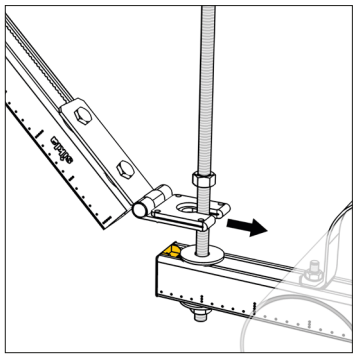


6. Fastening of pipes.

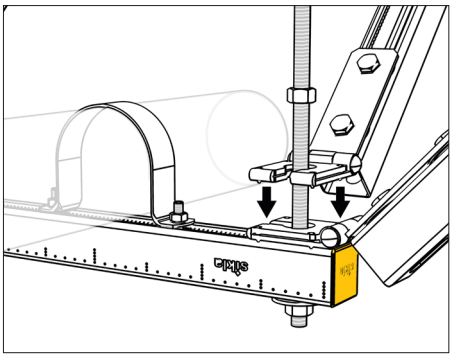
b) Subsequent assembly of the strut







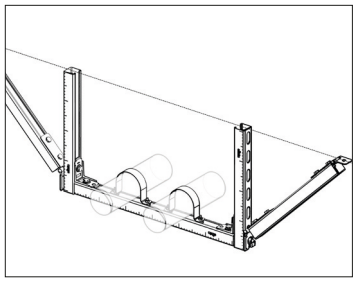
1. See installation steps 2 and 3 in “a) New installation”. To fasten the JOI R joint, the existing nut on the threaded rod is unscrewed and then tightened again. The ceiling assembly is identical to steps 3 and 4 of a new installation.

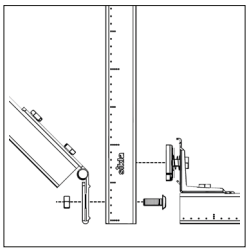


2. The stacking of several JOI R joints for bracing in different directions can be easily carried out.

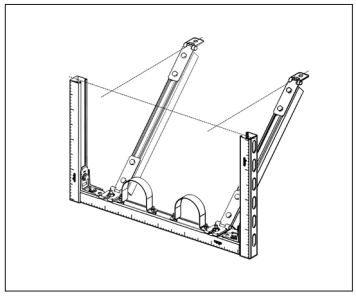
c) Frame assembly on back of channel

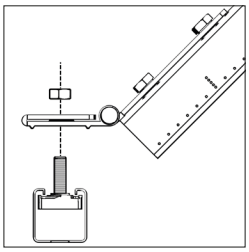
Lateral bracing:
Mount the joint JOI R using the appropriate flange screw SCR FLA HCP M10 on the back of the lateral channel.



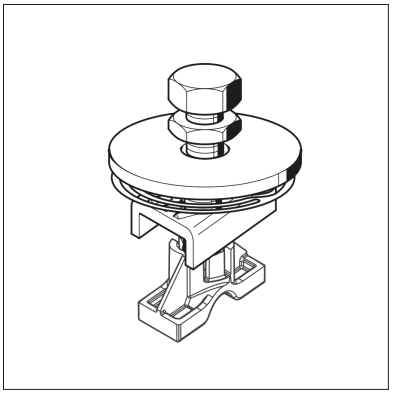


Longitudinal bracing:
Mount the joint JOI R on the horizontal channel by means of T-head bolt TBO HZ 41 M10 x 35





Rod Stiffener RST



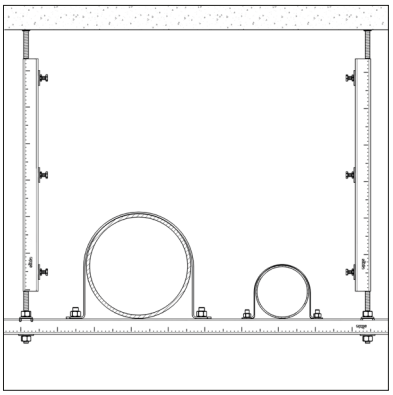
Application

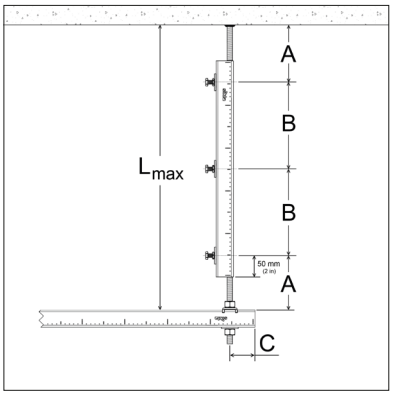
For stiffening the threaded hanger rods of trapeze bracket assemblies, to reinforce the bracket against seismic movement.

Size	Distances to be observed					
	Allowable Tension of Compression		L_{max} [1]	A_{max}	B_{max} [2]	C
	[N]	[lbs.]	[cm]	[cm]	[cm]	[cm]
M8	1.400	315	36,2	10	27,2	5
M10	2.210	497	45,5	10	34,1	5
M12	3.195	718	54,5	10	41,1	5
M16	5.860	1.317	74,1	10	55,6	5

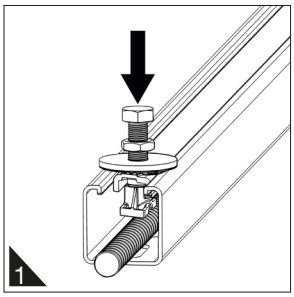
[1] Maximum Rod Length without Rod Stiffener

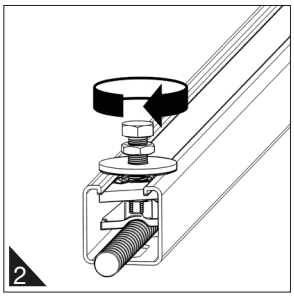
[2] Maximum spacing between two Rod Stiffener. Use of minimum two rod stiffeners per threaded rod.

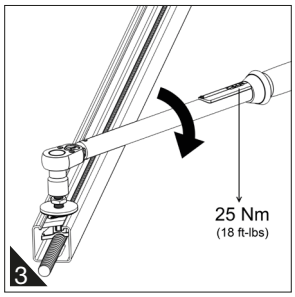


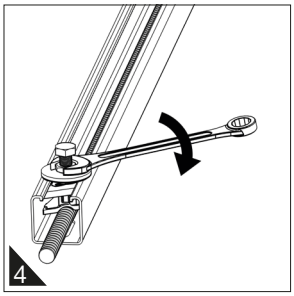


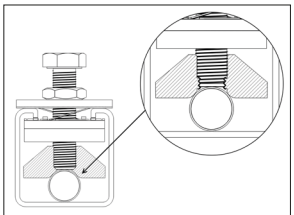
Assembly steps











During the assembly of the Rod Stiffener the material in this area will be supressed by the end of the screw, so a direct contact of steel-to-steel will be realised

Installation

1. Screw hexagon bolt*) into M10 or M12 threaded plate NT CC (Part no.: 180218;182252).
2. Click Rod Stiffener onto the end of the screw.
3. Clamp the threaded rod by inserting the Rod Stiffener assembly into the MS 41/41/2.5 channel (Part no.: 173909; 166720) and fix the screw with the specified tightening torque.

*) In conjunction with MS 41/41/2.5 a screw length of 40 mm is recommended.

Annex A

Calculation method according to DIN EN 1998-1:2010-12 / EN 1998-1:2004 + AC:2009 (D)

The stress values resulting from the seismic effect may be determined by applying a horizontal force Fa to the non-structural element that is defined as follows:

$$F_a = (S_a \cdot W_a \cdot \gamma_a) / q_a$$

where

- F_a is the horizontal seismic force, acting at the centre of mass of the non-structural element in the most unfavourable direction
- W_a is the weight of the element
- γ_a is the importance factor of the element, see below
- q_a is the behaviour factor of the element, see table below
- S_a is the seismic coefficient applicable to non-structural elements

  The seismic coefficient S_a may be calculated using the following expression:

$$S_a = \alpha \cdot S \cdot [3\,(1 + z/H) / (1 + (1 - T_a/T_1)^2) - 0{,}5]$$

where

- α is the ratio of the design ground acceleration on type A ground, ag, to the acceleration of gravity g
- S is the soil factor
- T_a is the fundamental vibration period of the non-structural element;
- T_1 is the fundamental vibration period of the building in the relevant direction;
- Z is the height of the non-structural element above the level of application of the seismic action (foundation or top of a rigid basement);
- H is the building height measured from the foundation or from the top of a rigid basement.

The value of the seismic coefficient S_a must not be less than $\alpha \cdot S$.

Importance factors

[1] For the following non-structural elements, the importance factor γ_a shall not be less than 1.5:

- anchorage elements of machinery and equipment required for life safety systems;
- tanks and vessels containing toxic or explosive substances considered to be hazardous to the safety of the general public.

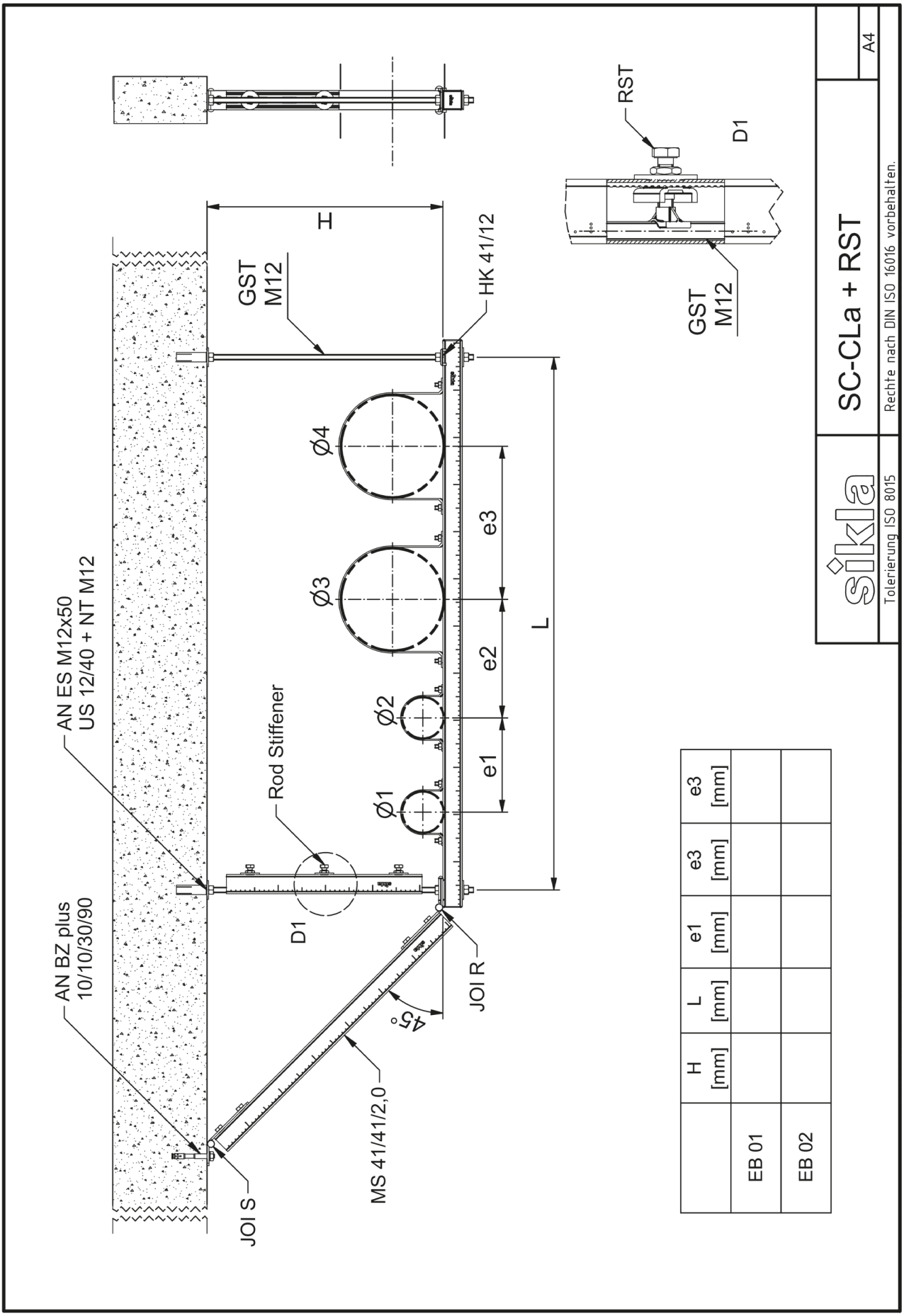
[2] In all other cases, the importance factor γ_a of non-structural elements may be assumed to be $\gamma_a = 1.0$.

Table 4.4 - Values of q_a for non-structural elements

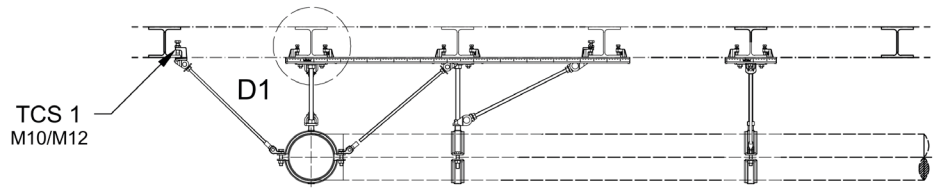
Type of non-structural element	q_a
Cantilevering parapets or ornamentations Signs and billboards Chimneys, masts and tanks on legs acting as unbraced cantilevers along more than one half of their total height	1.0
Exterior and interior walls Partitions and facades Chimneys, masts and tanks on legs acting as unbraced cantilevers along less than one half of their total height, or braced or guyed to the structure at or above their centre of mass Anchorage elements for permanent cabinets and book stacks supported by the floor Anchorage elements for false (suspended) ceilings and light fixtures	2.0

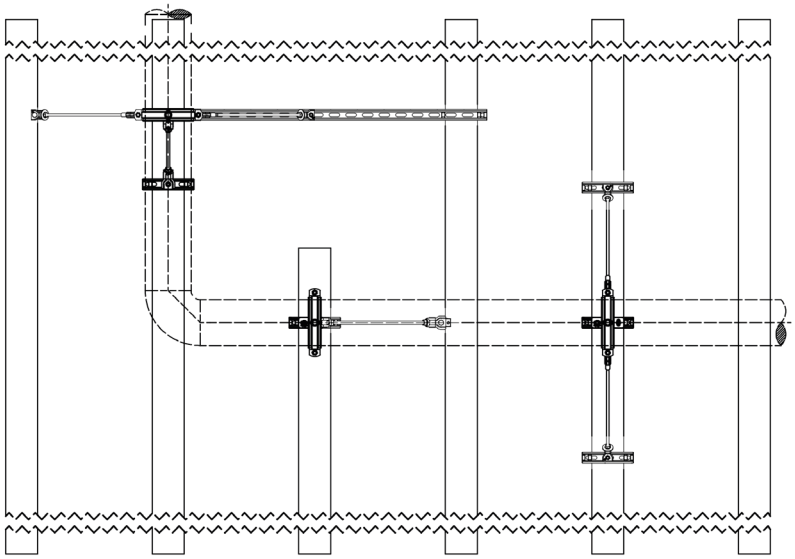
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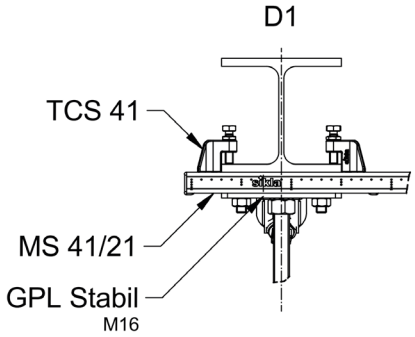
Annex B

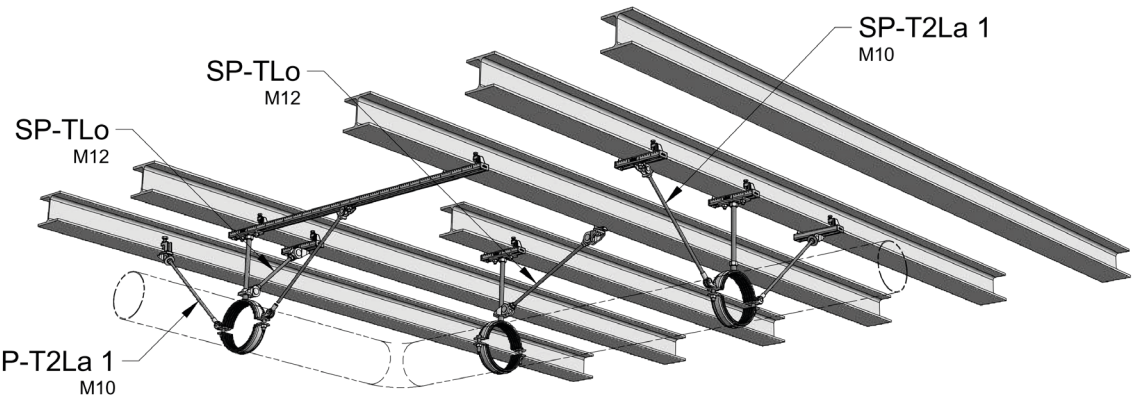


	H [mm]	L [mm]	e1 [mm]	e3 [mm]	e3 [mm]
EB 01					
EB 02					

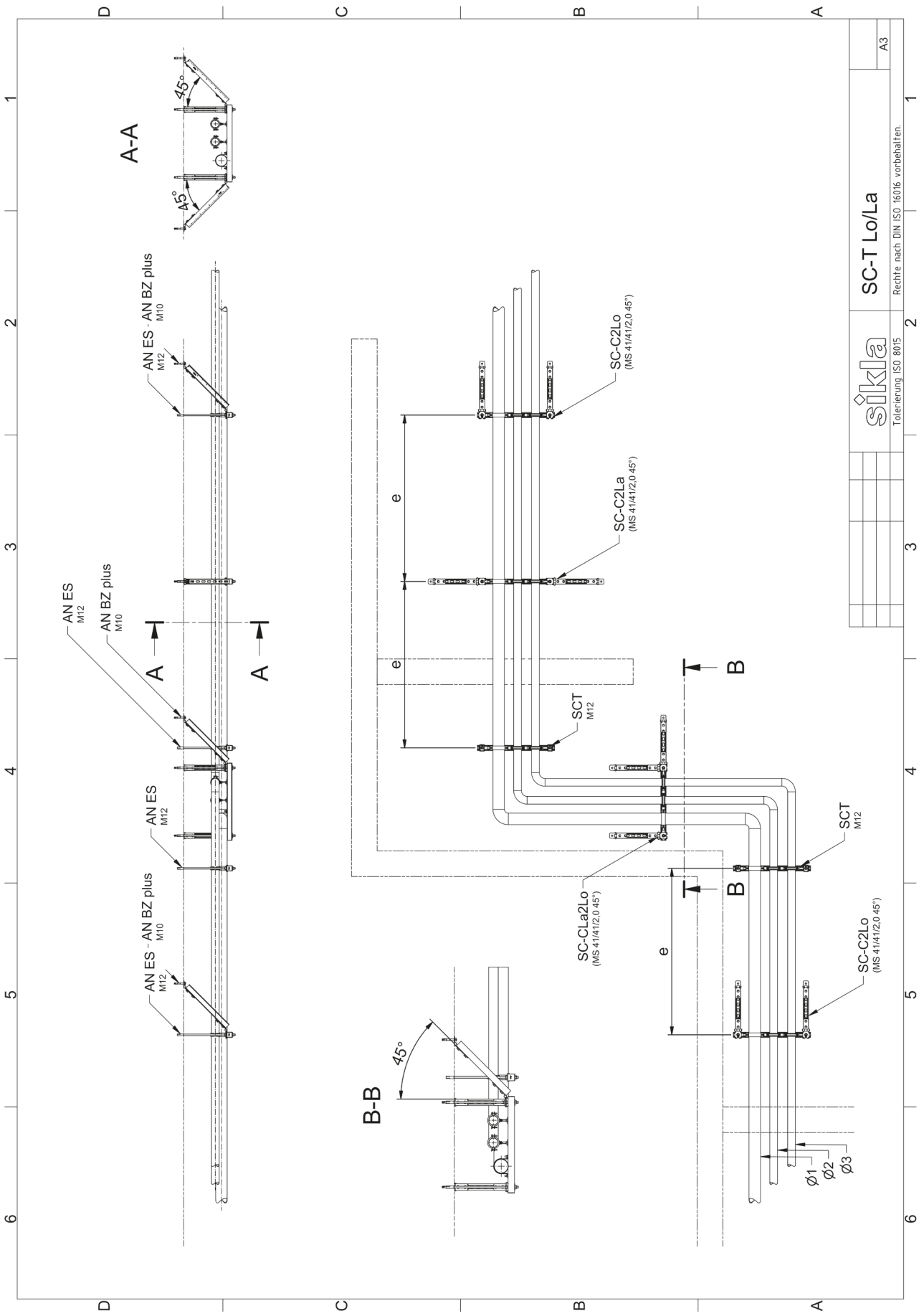


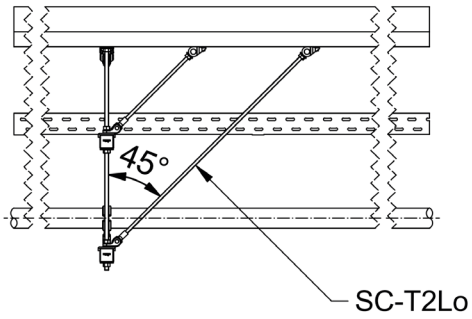


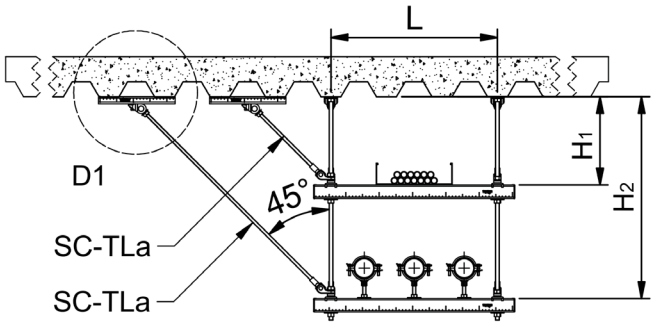


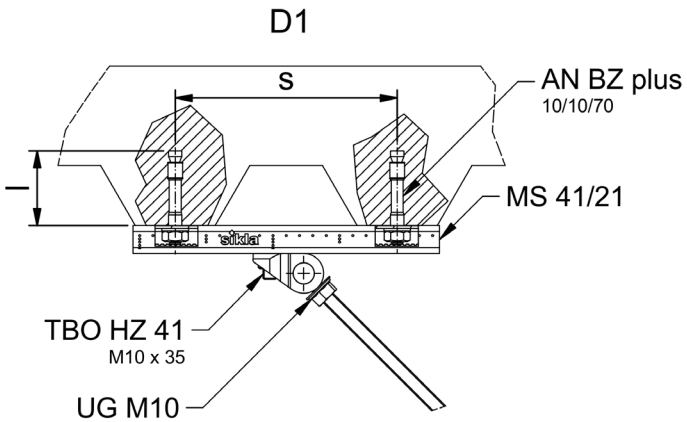


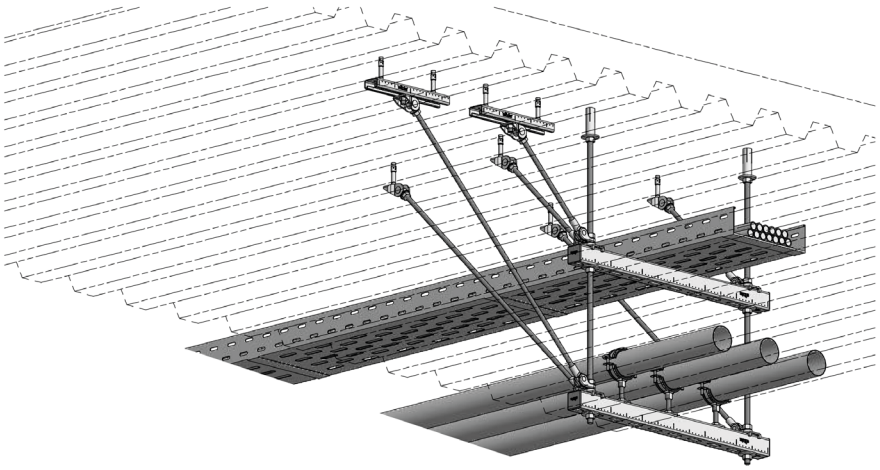
				sikla	SP-T Lo/La	
						A4
				Tolerierung ISO 8015	Rechte nach DIN ISO 16016 vorbehalten.	


A-A
45°
45°
AN ES - AN BZ plus
M10
M12
AN ES
M12
AN BZ plus
M10
AN ES
M12
AN ES - AN BZ plus
M10
M12
A
A
B-B
45°
SC-C2Lo
(MS 41/41/2,0 45°)
SC-C2La
(MS 41/41/2,0 45°)
SCT
M12
SC-CLa2Lo
(MS 41/41/2,0 45°)
SCT
M12
SC-C2Lo
(MS 41/41/2,0 45°)
e
e
e
B
B
Ø1
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sikla
SC-T Lo/La
A3
Toleranzen ISO 8015
Rechte nach DIN ISO 16016 vorbehalten.





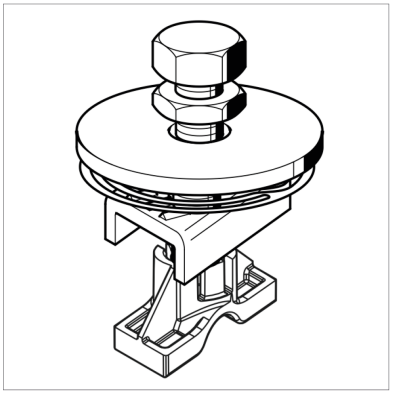


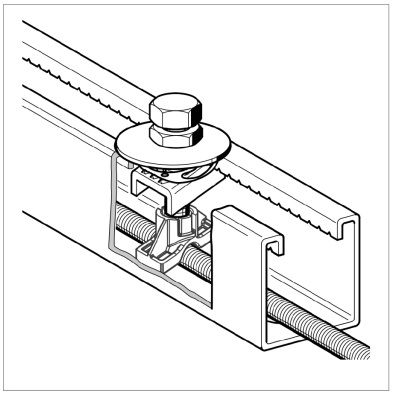


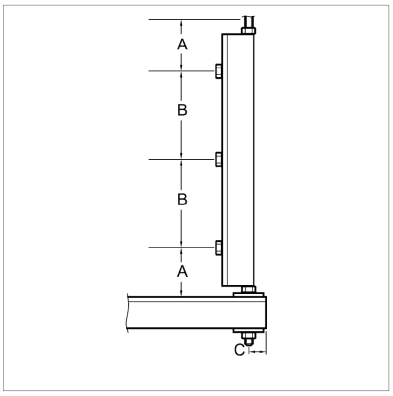
				sikla	2 x SC-TLa + SC-TLo	
						A4
				Tolerierung ISO 8015	Rechte nach DIN ISO 16016 vorbehalten.	

10/2019

Annex Retro-Fit Components







Rod Stiffener RST

Group: 1314

Application

For stiffening the threaded hanger rods of trapeze bracket assemblies, to reinforce the bracket against seismic movement.

Installation

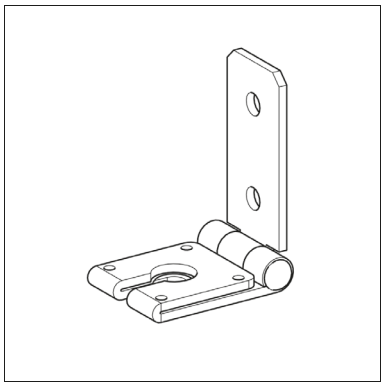
1. Push the rod stiffener RST onto the exposed end of the hex bolt.
2. Wrap the 41/41 channel around the threaded hanger rods of the trapeze bracket and push the RST assembled unit into the slot of the channel. Tighten the hex bolts to the torque setting below.

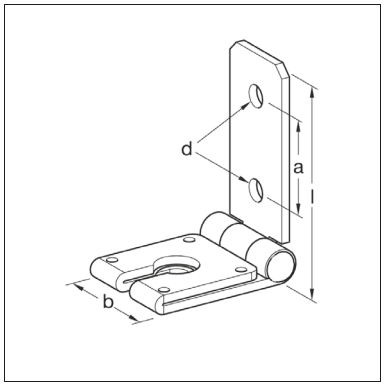
Configuration spacings	A [cm]	B [cm]	C [cm]
M10	max. 15	max. 45	min. 5
M12	max. 15	max. 45	min. 5

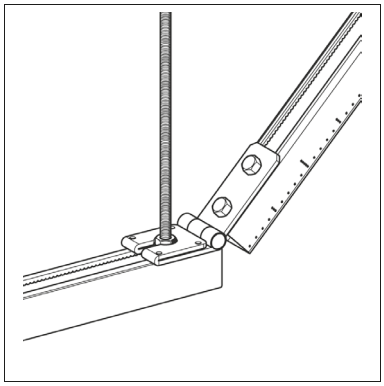
Technical Data

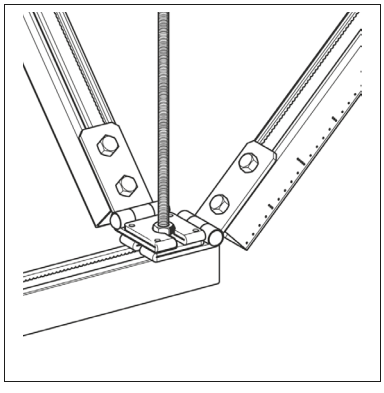
Setting torque: 25 Nm
RST Material: Polyamid nylon 6.6

Type	W [kg]	Quantity [pack]	Part number
RST assembly	0.12	100	**116674**









Joint JOI R

Group: 1342

Application

The Joint JOI R is used for bracing of channel installations which are of central importance to seismic support of services. Due to its keyhole shaped design the joint can be retrofitted. For installing directly to Channel 41 the four pins and two fixing points guarantee a reliable rotation lock. Brackets can be stacked for bracing longitudinally and transversely.

The rotation lock for the installation to an existing structure depends on the already used components. In case of the application of a Block PB 41 a rotation lock is given. In case of the application of a Holding Bracket or a Washer a rotation lock is only partly given.

Technical Data

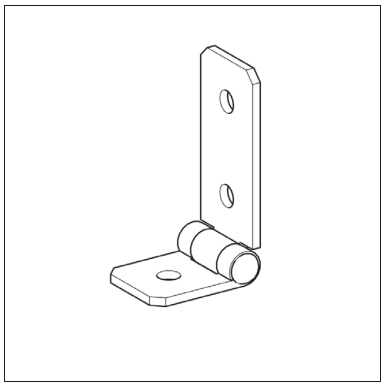
Type	suitable for
20	Hexagon nut M10 and $^{3}/_{8}$"-UNC
23	Flange nut M10, hexagon nut M12 and $^{1}/_{2}$"-UNC

Nominal load: 2.0 kN
Tightening torque: 50 Nm
Material: Steel, galvanised

The permissible maximum torsional moment of the channel (44.5 Nm) has to be respected.

Type	a [mm]	b [mm]	d [mm]	l [mm]	W [kg]	Quantity [pack]	Part number
20	62.5	50	10.5	126	0.33	50	**116576**
23	62.5	50	10.5	126	0.33	50	**116809**

10/2019



Joint JOI S

Group: 1342

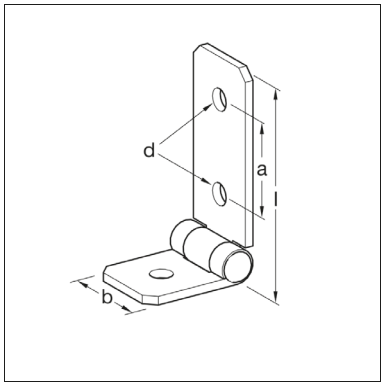
Application

To connect Channels 41 to the building structure if an arbitrary, continuous angle adjustment up to 180° is necessary. The Joint JOI S is especially used for the connection to the structure. The two fixing points to channel ensure a rotation lock, so lateral forces can be compensated.

Installation

Version 1:

1. Fix the Joint JOI S by means of anchor/plug or bolt to the building structure or to the channel.
2. Fix to channel by means of Channel Nuts M10.



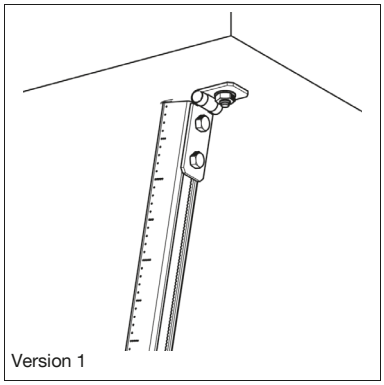
Version 2:

1. Insert the Channel Nut into the channel and fix it with the bolts.
2. Connection to building structure or channels with appropriate anchors or bolts.

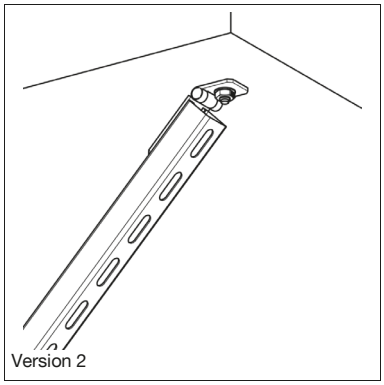
Technical Data

Nominal load: 2.0 kN
Tightening torque: 50 Nm
Material: Steel, galvanised

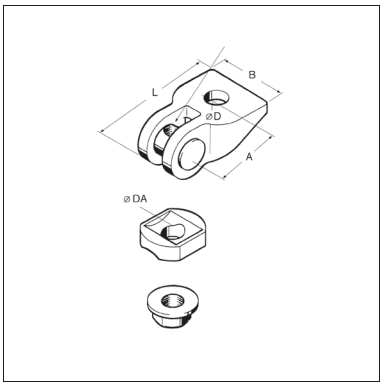
Type	a [mm]	b [mm]	d [mm]	l [mm]	W [kg]	Quantity [pack]	Part number
JOI S	44	40	10.5	98	0.21	50	**116577**



Version 1



Version 2



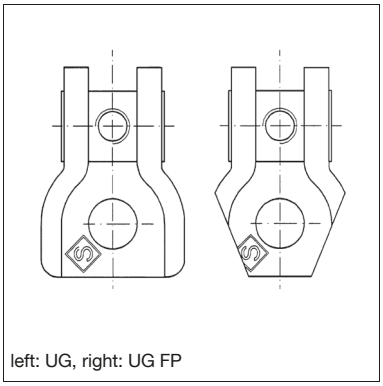
Universal Joint UG

Group: 1342

Application

Universal connection for attachment to non-horizontal components.
May be fixed directly to building surfaces, Beam Clamps, channels, etc. Typical uses would include easy on-site manufacture of various tie rod assemblies to support brackets, or reinforcement struts for sliding and fixed point applications (UG FP types are specifically designed for assembly for pipe clamp wings for fixed point constructions).

- Infinitely variable angle adjustment
- Length and height adjustment via rotation of the grub screw in the threaded pivot head
- Securely retained threaded pivot head
- Secure attachment of nut on the adapter plate.



left: UG, right: UG FP

Scope of delivery

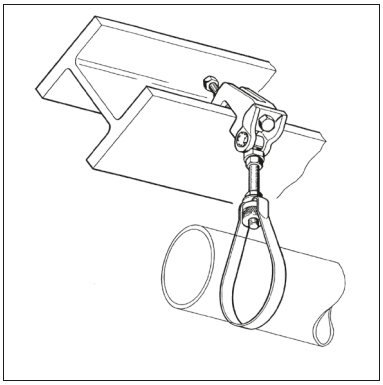
With adapter plate and locking nut.

Installation

Screw the grub screw completely into the pivot head (visual control).
Fix the adjusted angle by tightening the supplied nut against the adapter plate.

Technical Data

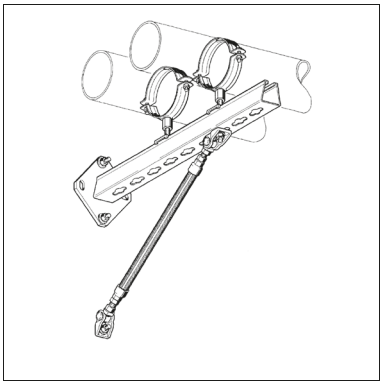
Type	Working load [kN]	Adapter plate Ø DA [mm]	Nut
UG M8	5.8	10.5	Flange nut
UG M10	8.0	10.5	Flange nut
UG M12	13.0	16.5	Flange nut
UG M16	13.0	16.5	Hexagon nut
UG FP M12	10.0	16.5	Flange nut
UG FP M16	10.0	16.5	Hexagon nut



Adm. load Fz_{zul} in case of fire

Type	FWD 30 [kN]	FWD 60 [kN]	FWD 90 [kN]	FWD 120 [kN]
M8	0.60	0.45	0.34	0.26
M10	0.60	0.60	0.54	0.42
M12	1.60	1.03	0.79	0.61
M16	1.60	1.60	1.47	1.13

Material: Steel, electro-galvanised (versions M8 and M10)
Malleable cast iron, electro-galvanised (versions M12 and M16)

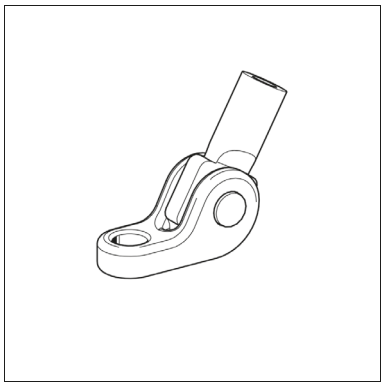


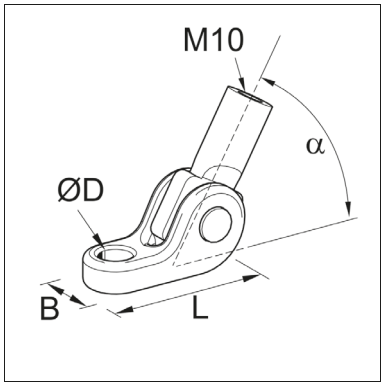
Approvals / Compliance

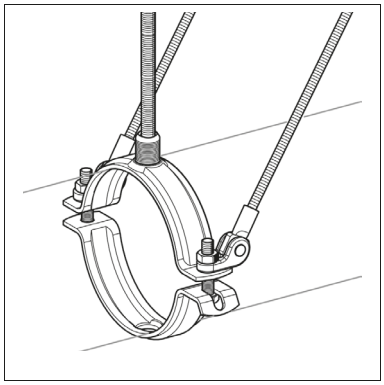
VdS Approval G4980055 for types UG M8 to UG M16.

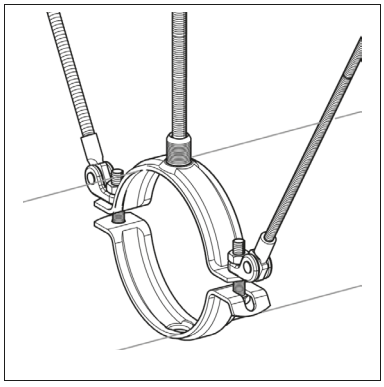
Type	Pivot head	A [mm]	B [mm]	Ø D [mm]	L [mm]	W [kg]	Quantity [pack]	Part number
UG M8	M 8	26	40	10.5	51	0.18	50	**198636**
UG M10	M10	26	40	10.5	51	0.12	50	**198643**
UG M12	M12	33	50	17.0	71	0.37	25	**158075**
UG M16	M16	33	50	17.0	71	0.36	25	**158084**
UG FP M12	M12	33	50	17.0	71	0.32	25	**158093**
UG FP M16	M16	33	50	17.0	71	0.31	25	**158109**

10/2019









Support Joint SG

Group: 1342

Application

The Support Joint is fixed directly to the flanges of the pipe clamp to provide additional bracing to the overall pipe support.

- Adjustable brace angle
- The Support Joint can be rotated 180° radially about the clamping bolt connections either side of the pipe clamp
- Captive pivoting link eye

Scope of delivery

Forged Support Joint with captive pivoting Link Eye

Installation

Adjustment of Support Joint by means of the pipe clamp's clamping bolts. Subsequently the threaded rod is screwed in the Link Eye.

Technical Data

Appropriate Support Joint / Pipe Clamp combinations:

SG M10-11: Stabil D-3G (133-140 to 167-173)
Stabil D-A (76-81 to 124-129)
Stabil RB-A (13-18 to 45-49)

SG M10-13: Stabil D-3G (176-184 to 310-316)
Stabil D-A (133-140 to 297-303)
Stabil RB-A (57-61 to 214-220)
Stabil D-M16 (218-227 and 271-277)

SG M10-17: Stabil D-A (316-324 to 513-521)
Stabil RB-A (248-254 to 603-610)

Type	Angle α	Perm. load [kN]
SG M10-11	0 - 45° 90°	15 5
SG M10-13	0 - 45° 90°	15 6
SG M10-17	0 - 45° 90°	15 7

Material:
Joint: Cast, electro-galvanised
Link Eye: Steel, electro-galvanised

Type	Ø D [mm]	B [mm]	L [mm]	Quantity [pack]	Part number
SG M10-11	11	20	52	25	**115044**
SG M10-13	13	22	54	25	**115045**
SG M10-17	17	27	59.5	25	**115046**